DETERMINANTS OF LIVELIHOOD STRATEGIES IN A MARINE EXTRACTIVE RESERVE

A Dissertation

by

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ABSTRACT

This dissertation investigates the intersection between environmental conservation and livelihoods of small-scale producers. Conservation territories have been expanding into coastal-marine environments because of processes across scales, and with this expansion is a dominant trend of community-based conservation with dual goals of protecting livelihoods and biodiversity. The Brazilian, extractive reserve (RESEX) is such a model, increasingly being established in coastal-marine environments with ambiguous outcomes. This dissertation specifically investigates RESEX governance and livelihood production; namely the institutional, material, and discursive practices of RESEX actors by applying qualitative and quantitative methods; and adapting governance assemblage and livelihoods analytics through a political ecology lens. The case of the Cassurubá RESEX in eastern Brazil is presented here and demonstrates contradictions between the RESEX instrument, and its operationalization and outcomes. The Cassurubá RESEX was established as a politicized battle between environmentalists and politicians, and resource users were pawns in the territorial game. New institutions for fisheries and land-use undermine the livelihood strategies of resource users, producing adverse effects. The abstraction of resource users as RESEX "beneficiaries," who can access RESEX benefits, disembodies them of their culturally embedded livelihoods rendering them artifacts of the RESEX. The focus on 'beneficiaries" veils processes of power and the specific effects of the RESEX; land has been appropriated for conservation; resource users are being accounted for as they have

a new relationship with the state; and their livelihoods are being reconstituted through the RESEX instrument. These findings lead to several conclusions: RESEX are territorial instruments of control over people, resources, and relationships in a geographic space; "beneficiaries" are an "imaginary collective subject" produced by government actors that renders the appropriation of land, and expansion of bureaucratic state power, invisible; and more normatively, conservation and development agendas must consider the differential livelihood strategies of resource users or efforts will be undermined. The case of the Cassurubá RESEX illustrates how discursive and territorial practices of RESEX produce differentiated impacts on livelihood strategies among affected resource users. The findings also demonstrate that environmental governance and livelihoods cannot be treated as discrete elements in investigations of conservation instruments with goals of protecting livelihoods.

DEDICATION

This dissertation is dedicated to my parents, Izaura Nunes dos Santos and Reinaldo da Cunha dos Santos, who left their countries over five decades ago in search of opportunity for themselves and their children.

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NOMENCLATURE

AMPAC	Associação de Marisqueiros de Ponta de Areia e Caravelas
APESCA	Associação de Pescadores de Caravelas
CBD	The Convention on Biological Diversity
CEPENE	Centro de Pesquisa e Gestão de Recursos Pesqueiros do Nordeste
CERB	Companhia de Engenharia Ambiental e Recursos Hídricos da Bahia
CI	Conservation International
CNPJ	Cadastro Nacional da Pessoa Jurídica
CONAB	Companhia Nacional de Abastecimento
EBDA	Empresa Baiana de Desenvolvimento Agrícola
IBJ	Instituto Baleia Jubarte
IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais
ICMBio	Instituto Chico Mendes de Conservação da Biodiversidade
INCRA	Instituto Nacional de Colonização e Reforma Agrária
INEMA	Instituto do Meio Ambiente e Recursos Hídricos
ITR	Imposto sobre a Propriedade Territorial Rural
MER	Marine Extractive Reserve
MPA	Ministério da Pesca e Aquicultura
MPA	Marine Protected Area
PNHR	Programa Nacional de Habitação Rural
RESEX	Extractive Reserve/Reserva Extrativista

SCBD	Secretariat of the Convention on Biological Diversity
SEDUR	Secretaria de Desenvolvimento Urbano
SEMA	Secretaria de Estado de Meio Ambiente
SEPROMI	Secretaria de Promoção da Igualdade Racial do Governo do Estado da Bahia.
SETUR	Secretaria de Estado do Turismo do Bahia
SNUC	Sistema Nacional de Unidades de Conservação
WPC	World Parks Congress

CHAPTER I

INTRODUCTION

"At 5:45p.m on Thursday December 22, 1988, Francisco 'Chico' Alves Mendes Filho, trade union leader, rubber tapper, and ecologist was assassinated in the doorway of his home in Xapuri, Acre" (Gross 1992, 144). Chico Mendes led the social movement to protect rubber-tapper rights and access to land and resources (rubber trees and Brazil nut trees), and to protect the Brazilian Amazon from cattle ranchers. The twelve-year battle between rubber tappers and cattle ranchers was one of violence demonstrated by *empates* (stand-offs between rubber tappers and cattle ranchers) and epitomized by his murder. However, Chico Mendes did not die in vain. His movement to have government expropriate land for the creation of extractive reserves (RESEX) succeeded. The Chico Mendes RESEX was created in his honor on March 12, 1990 (Decree 99.144) followed by hundreds of others in the following decades, and his legacy lives on today.

This dissertation explores the "second generation" RESEX (Glaser and Oliveira 2004) being established in coastal-marine environments. Marine extractive reserves (termed marine RESEX or MERs) are an imbroglio of resource users with very diverse livelihoods, government and NGO officials, firms, resources, institutions, discourses and knowledges among other things. I weave through this morass and show that MERs tend to be opposite of its Amazonian counterpart; resource users are struggling for their rights to land and resources *because of* the RESEX. Yet, this is hardly challenged as RESEX are sacred because of the legacy of Chico Mendes' movement to protect livelihoods,

resources and the Amazon. According to a key informant who supported the RESEX, *"It is a good model. Like Chico Mendes, he is like the Jesus of the RESEX. He died to give us the RESEX."*

In the remainder of this introductory chapter, I discuss the background informing this research, which includes the expansion of conservation territories, marine conservation and the RESEX in Brazil, and the interface between conservation and livelihoods. I then present the research problems, hypotheses and questions, followed by the specific conceptual framings applied in this research. The chapter finalizes with and overview of the dissertation to guide the reader.

1.1 Research background

1.1.1 Expansion of conservation territories

The expansion of marine conservation territories is a relatively recent process of environmental globalization (Zimmerer 2006b; Zimmerer 2006a). The area of MPAs (marine protected areas) has more than doubled globally in the last two decades (WDPA 2011). While terrestrial protected areas now cover over 12 % of the Earth's terrestrial surface, approximately 6% of territorial seas are designated as protected (WDPA 2011). The Convention on Biological Diversity (CBD) millennium development goal of 10% for 2010 had been reached for terrestrial but not for marine areas (10% for 2012) (Coad et al. 2009), hence the recent global urgency to create MPAs.

Coastal and marine areas have been a conservation priority for government, non-government organizations (NGOs) and foundations, and millions of dollars has been

allocated for MPA creation because of loss of biodiversity, habitat destruction, pollution, and climate change in both developed and developing countries (Imtiyaz, Sweta, and Kaba Prakash 2011). The World Parks Congress (WPC) called for 20-30% of the world's marine habitats to be protected by 2012 and Balmford et al (2004) reported that it may cost between "$5 billion and $19 billion annually to run" this global MPA network. Further, the urgency to create MPAs has ensued despite the fact that "the numbers of MPAs and their coverage can be misleading indicators of effective conservation" and most MPAs are ineffective (Mora et al. 2006, 1750).

1.1.2 The extractive reserve in Brazil

The political momentum to establish MPAs is evident in Brazil, which has made an agreement with the CBD to protect 10% of its marine waters by 2020 (PCT 2012). Less than 2% of Brazil's marine waters are protected and the number of MPAs and their sizes are considered by government and NGOs as inadequate to sustain marine resources (Amaral and Jablonski 2005). There is also political pressure to create marine extractive reserves (termed marine RESEX or MERs) because of Brazil's agreement with the CBD. The Secretariat of the Convention on Biological Diversity reported in 2010 (SCBD 2010) that potentially 60 more MERs would be established in the country and Glaser and Oliveira (2004) claimed there was a "policy initiative to create 500 RESEX" in Brazil. Of the 151 MPAs documented in Brazil, 18 are MERs (CUNC/MMA 2014). Although it is a bottom-up approach to conservation and resource management, it is not uncommon for government officials to promote RESEX establishment to local resource users

(Glaser and Oliveira 2004). MERs, termed the "second generation RESEX" in coastal regions, have gained popularity in the field of conservation as an alternative to "strict" protected area models that historically have displaced or removed resource users from access to resources. The specific aim of MERs, as a sustainable use conservation unit, is to protect traditional communities, their livelihoods, the resources on which they depend, and biodiversity (Brazil 2000; De Moura et al. 2009), or "win-win" outcomes.

The MER in Brazil is based on the terrestrial extractive reserve (RESEX) model which developed from the social movement led by Chico Mendes aimed to protect rubber tapper laborer rights, and their access to resources and land, from logging and cattle ranching encroachment (Keck 1995; Di Commo 2007; Vadjunec, Schmink, and Gomes 2011). The Chico Mendes RESEX was established in his name, in 1990, following his murder and the RESEX model has been subsequently heavily endorsed by conservation and development actors (Hecht and Cockburn 1989; Keck 1995; Hecht 2007). However, recent research on RESEX indicates phenomena that are highly relevant to the proposed work on MERs.

First, RESEX residents who do not rely on rubber still consider themselves to be rubber tappers (Vadjunec, Schmink, and Gomes 2011). This demonstrates the social and cultural nuances of livelihoods and sense of identity surrounding RESEX. Second, cattle ranching as a supplement to rubber tapping has emerged as a major livelihood strategy in RESEX (Salisbury and Schmink 2007; Maciel et al. 2010). Rubber tapping profit declined after government ceased delivery of rubber subsidies in the 1990s and rubber tappers needed to adjust their livelihood practices in response to market shifts and

economic opportunities (Keck 1995; Vadjunec and Rocheleau 2009; Maciel et al. 2010). These findings suggest potential contradictions between the RESEX model and the livelihood strategies of households relying upon resources within the reserve territory. Further, the questions of how and why the RESEX model has been transferred to coastal-marine environments and the produced livelihood effects remain unanswered.

Several claims support MER creation including protection of traditional fishing communities, their livelihoods and the resources on which they depend, and biodiversity (De Moura et al. 2009; Brazil 2000). Federal institutions are in place that responds to "local" demand to create MERs, often in cases of resource conflict (Glaser and Oliveira 2004). Many MERS were established because of conflict between "local" fisherfolk and "outsiders," between fisherfolk and MPA authorities, and because of the depletion of local marine resources by industrial fishing fleets (Di Commo 2007; De Moura et al. 2009; SCBD 2010). MER establishment is said to be participatory, empower and promote active citizens (through participatory decision-making), and result in economic improvement (through government incentives), and co-management of natural resources (Glaser and Oliveira 2004; Di Commo 2007; Fadigas and Garcia 2010). MERs are also claimed to empower women who are typically excluded from participatory processes in decision-making (Fadigas and Garcia 2010). Because of these potential benefits, resource users are termed "beneficiaries" by RESEX institutions (ICMBio 2013a).

Contrary to positive claims, several scholars have questioned the feasibility of MERs as a conservation and development mechanism (Da Silva 2004; De Moura et al. 2009; Di Commo 2007; Glaser and Oliveira 2004). Participation in MER establishment

has been stated as weak and livelihood outcomes poor. Conflict from MER establishment has been categorized as economic and political and even NGOs are fighting for "NGO 'territories" (Glaser and Oliveira 2004, 229). Stronger interest groups have monopolized forums, and social conflict among fishing communities ensued where traditional structures based on class and local norms were barriers to equity in decision-making and economic benefits (Da Silva 2004; De Moura et al. 2009). Da Silva has shown how the first MER established in Arraial do Cabo resulted in "negative social capital" (2004, 426) because imposed MER institutions did not account for existing social differences between fishing communities. Unintended consequences occurred with establishment of the Corumbau MER. Although planning was a participatory process, MER authorities failed to define "traditional population" beneficiaries early on which resulted in inherent conflict between locals for rights to MER resources (De Moura et al. 2009). Following resolution of beneficiary definition and plans for economic development, exclusive rights to the MER did not result in improved income or livelihoods (De Moura et al. 2009; Gerhardinger, Godoy, and Jones 2009). Di Commo (2007) further argues that exclusion of women from participatory decision-making hinders successful collective action and the ability of MERs to meet efficacy or equity goals. The overall resulting co-management regimes of these MERs (Corumbau and Arraial do Cabo) are stated as ineffective as not all stakeholders were included in planning or decision-making, were not aware of their responsibilities, and they lack state and financial support. Further, most MERs lack management plans making it difficult to measure their effectiveness (Santos and Schiavetti 2014). As a community-based

conservation and development instrument resulting from multi-scalar processes, RESEX deserve attention with the critical lens of Geography.

1.1.3 Conservation and livelihoods

Scholars have been concerned with the ways in which conservation agendas intersect with livelihoods and produce adverse effects (Zimmerer and Bassett 2003; Peet and Watts 2004; Goldman 2005; Brockington and Igoe 2006; West, Igoe, and Brockington 2006; Zimmerer 2006b; Zimmerer 2006a; Li 2007b; Agrawal and Redford 2009; Goldman, Nadasdy, and Turner 2011; Robbins 2012). Linking conservation to livelihoods is a key element of the "third wave" of conservation and development initiatives (Goldman 2005; Zimmerer 2006b). The "third wave" is the response of the Fourth World Congress on National Parks and Protected Areas, and the United Nations Conference on Environment and Development (World Summit) of 1992. The notion of sustainability emerged with new hybrid, decentralized, forms of environmental governance such as community based conservation, and extractive reserves (Zimmerer 2006b).

Specifically, in developing countries, conservation policies have shifted toward participatory resource governance in response to the scrutiny of protected areas and "fortress conservation" that historically displaced resource users or restricted their access to resources (Neumann 2004; Hayes and Ostrom 2005; Robbins et al. 2005; Stadler 2005; Brockington and Igoe 2006; Hayes 2006; West, Igoe, and Brockington 2006; Adams and Hutton 2007; Kaimowitz and Sheil 2007; Li 2007b; Agrawal and Redford

2009; Dowie 2009; Lele et al. 2010). Conservation in coastal and marine environments necessarily entails interaction with resource users, particularly fishermen and women who utilize resources of these spaces to maintain their livelihoods and although they may not be physically displaced, they may experience "economic displacement" through restricted or lost access to resources (Lele et al. 2010). Geographers have shown how conservation intersects with livelihoods of small-scale producers such as farmers (Zimmerer 2006b), yet there are few examples in coastal-marine environments: Mexico (Young 1999; Young 2001), the Pacific Coast, USA (Mansfield 2007), Honduras (Lansing 2009), French Polynesia (Walker and Robinson 2009) and South Africa (King 2011).

The Brazilian RESEX adds to these concerns. The socio-political issues of RESEX, explained above, deserve attention because they are the outcome of initiatives with "positive" claims of community empowerment, increased equity and economic benefits (Glaser and Oliveira 2004; Defilippis, Fisher, and Shragge 2006). Community-based conservation, however, has received scrutiny because of its preconceived romantic notions and inability to promote change that extends beyond "the local" (Creed 2006; Defilippis, Fisher, and Shragge 2006). Community is a "loaded term for designating groups of people," is associated with identity construction (Creed 2006, 12), and development is "value laden" (Sumner and Tribe 2008). The taken-for-granted term requires scrutiny and the question of who "deploys" community in conservation and development agendas must be examined to understand new political forms of governability (Creed 2006; Li 2007b, 2007a). As Li argued, "NGOs 'sell' the term

community in order to access donor-funded projects" (Li 2007a, 277). Moreover, community-based conservation agendas and hybrid forms of resource governance may be a form of "curtailed access to local commons" and also cause displacement through restrictions on resource use, which negatively impacts livelihoods (Neumann 2004; West and Brockington 2006; Li 2007b; Larson and Soto 2008; Lele et al 2010; Robbins 2012).

Empirical evidence demonstrates how community based conservation produces adverse, differential affects on resource user livelihoods. For example, Larson and Soto (2008) summarize how decentralized forms of environmental governance result in shifts in resource access affecting resource users; shifts in power relations that reinforce social inequalities such as gender and age; and allocation of power to local government undermining livelihoods. Li (2007b) specifically shows how access to resources, such as coffee trees, was rescinded multiple times under the guise of community forest management surrounding the Lore Lindu National Park in Indonesia. In the case of community forest management in Guatemala, some resource users "appropriated" the language of conservation actors "to achieve goals consistent with their own interests" at the expense of others (Sundberg 2003b, 51). Others have formed new environmental identities while becoming subjects of the state (Agrawal 2005; Li 2007b). Finally, West and Brockington (2006) summarize evidence showing how community based conservation affected the health of children in the Philippines, health of villages in Madagascar, displaced people in Pakistan, exacerbated social differences in the Caribbean, and imposed western conservation discourse in Honduras. They conclude,

"outcomes, for either livelihoods or conservation, are hard to evaluate for want of good data" (West and Brockington 2006, 613).

What are the data they refer to? Scholars of livelihoods posit that resource user livelihood strategies should inform conservation and development agendas, because livelihoods are typically evaluated after the fact (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004b; Carr and McCusker 2009; Lansing 2009; Walker and Robinson 2009; Chowdhury 2010; King 2011) and expertise of social science is typically introduced late in agendas, if at all (Carr and McCusker 2009).

1.2 Research problem, hypotheses and questions

This research responds to the concerns of RESEX and the recent work by geographers and other scholars who study livelihoods in conservation settings, and fills two main gaps. First, previous studies of MERs (Da Silva 2004; Glaser and Oliveira 2004; Di Commo 2007; De Moura et al. 2009; Nobre and Schiavetti 2013) have been mainly focused on governance principals and they demonstrate the social conflict that ensues from MER establishment. However, the actual livelihood practices and strategies of MER resource users have not been examined and the affects of MERS on resource user livelihoods remain unclear. A conservation instrument inscribed with the term "livelihoods" necessarily demands an examination of livelihood strategies in place. Second, in regard to scholarship in Geography concerned with environmental governance, there is a good deal of literature that demonstrates how conservation

agendas intersect with livelihoods of small-scale producers such as farmers (Zimmerer 2006b), yet there are few examples in coastal-marine environments as previously mentioned. This research advances this literature.

In filling the empirical gaps above, I broadly aimed to determine the specific effects of RESEX establishment on resource user livelihoods. I broadly ask how resource-user livelihoods are negotiated and (re)produced through discursive and territorial practices of RESEX following the insights of Li (2006b) and Carr (2013). The case of the Cassurubá RESEX in Bahia State, Brazil, was used as a site to test the broader claim that discursive and territorial practices of RESEX produce differentiated impacts on livelihood strategies among affected resource users.

I evaluate three overlapping quasi hypotheses (*sensu* Bebbington and Bury 2009). First, MERs comprise a conservation agenda that curtails access to resources negatively impacting livelihoods (Neumann 2004; West and Brockington 2006; Li 2007b; Larson and Soto 2008; Lele et al. 2010; Robbins 2012). Second, conservation and development agendas must consider the differential livelihood strategies of resource users or efforts will be undermined (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004b; Carr and McCusker 2009; Lansing 2009; Walker and Robinson 2009; Chowdhury 2010; King 2011; Carr 2013). Third, the institutions of RESEX are inconsistent with livelihood strategies of terrestrial and marine resource-users (Salisbury and Schmink 2007; Vadjunec, Schmink, and Gomes 2011).

To test the above claims and hypotheses, I asked the following specific research questions: (1) How, why, and through what means was the Cassurubá RESEX

established? (2) Is there dichotomy between market oriented and subsistence based households of the Cassurubá RESEX? If so, are there differential impacts on livelihoods from establishment of the Cassurubá RESEX and new institutions? How and why do the impacts differ? (3) How have resource-users contested, or adjusted to, the status of "beneficiary," or the RESEX in general? Who are RESEX beneficiaries? How and why are RESEX "beneficiaries" produced? What are the specific social and political effects of establishment of the Cassurubá RESEX? From these questions it should be clear that this dissertation examines the socio-political effects of the RESEX and not biodiversity outcomes.

1.3 Conceptual framings

Three analytical methods intersect through a political ecology lens to answer the research questions above. These are Li's governance assemblage analytic (2007a), the livelihoods approach (Bebbington 1999; Bebbington et al. 2006) and discourse analysis (Mels 2009). In this section I discuss each of these framings and how they overlap. First, I begin with review of how environmental governance is examined in political ecology (Robbins 2012). Second, I turn to Li's (2007a) governance analytic and show how it is a sophisticated, yet practical tool, for examining environmental governance, and how it particularly addresses power relations. Third, I turn to the livelihoods approach, or capital assets and capabilities framing (Bebbington 1999; Bebbington et al 2006), as it is conducive to understanding how livelihoods are produced, and the implications for

conservation policy. Lastly, I briefly discuss discourse analysis (Mels 2009) as a tool for examining the power of discourses in environmental governance.

It is important to note that discourse analysis is not singular, as it is a component of political ecology and the assemblage analytic. The sequence in this discussion of the conceptual framings, therefore, is intended to follow the flow of the three core chapters (III, IV, V) of this dissertation where each framing is applied. This work also argues for mixing quantitative and qualitative methods, showing that methodological pluralism is more informative and conducive to answering *why* and *how* questions and provides for better interpretation of social processes that cuts across scales (Rocheleau 1995; White 2002; Zimmerer 2004; Montello and Sutton 2006; Doolittle 2010).

Lastly, I draw mainly from secondary literature for the applied frameworks in terms of grand theories, specifically those of Michel Foucault and Karl Marx, rather than dive deep in the primary literature, which may be considered a weakness in this dissertation. However, debating these grand theories is beyond the scope of this dissertation. Rather, I aim to contribute to both empirical studies and broader theories within human geography that approve the convergence of these respective grand scholars, particularly those held in the subfield political ecology.

1.3.1 Political ecology and environmental conservation

Political ecology is defined by Paul Robbins (2012, 4-5) as "something people do," and "constitutes a community of practice and characterizes a certain kind of text." Political ecology, therefore, is not a framework, but the field adapts multiple and various

"critical tools" to contribute to the answering of an array of questions concerned with social, ecological, and political processes and how they intersect. Specifically, political ecologists see nature, ecology and natural resources as inherently political and they problematize "apolitical" theories, and claims of actors in power (Robbins 2012). For example, environmental degradation is often claimed to be, by actors in power, a result of lack of ecological knowledge of small-scale producers, or poor implementation of contemporary economic techniques (proximate causes), rather than caused by broader political-economic and historical processes (Robbins 2012).

With a critical lens of determining who is controlling whom and what, and for what purposes and how, political ecologists apply qualitative or quantitative methods or mixed methods (Vadjunec and Rocheleau 2009). Discourse analysis is also often a component of political ecology research concerned with the ways in which knowledge and language are forms of power in conservation (Sundberg 2003b) and environmental governance (Mels 2009) in general, and this will be discussed in more detail below.

Further, arenas of conflict over environmental resources are ideal for conducting studies of environmental governance as it involves power struggles over resource access and use (Goldman, Nadasdy, and Turner 2011; Vadjunec, Schmink, and Gomes 2011; Robbins 2012). Specific to environmental governance and livelihoods, political ecologists are concerned with the ways in which conservation interventions have produced adverse effects on livelihoods and how powers relations in environmental governance determine resource access and use. I draw from three overlapping themes in political ecology: "conservation and control," "environmental conflict and exclusion,"

and "environmental subjects and identity thesis" (Robbins 2012). These themes emerged in this research and will be demonstrated throughout the core chapters (III, IV, V) of this dissertation.

First, the "conservation and control thesis" is most prominent in this research. The thesis posits: "Control of resource and landscapes has been wrested from producers, or producer groups (associated by class, gender, or ethnicity) through the implementation of efforts to preserve 'sustainability', 'community', or 'nature''. In the process, local systems of livelihood production, and socio-political organization have been disabled by officials and global interests seeking to preserve the environment" (Robbins 2012, 21). According to political ecological work, officials, or actors in power, often regard the practices of these producers as unsustainable, despite a history of being productive and benign (Robbins 2012). Second, the "environmental conflict and exclusion thesis" posits that conservation enclosure causes, and reinforces, social conflict as "environmental problems become 'socialized'" and particular individuals or groups maintain control at the expense of others who are excluded (Robbins, 22). Third, the "environmental subjects and identity thesis" claims "institutionalized and power-laden environmental management regimes have led to the emergence of new kind of people"…with new identities and …"created imperatives for local groups to secure and represent themselves politically" (Robbins 2012, 23). The premise of this thesis is that of governmentality, which involves getting people to act in a way they believe is in their own interest, and the practice of governing "men in their relations with things…wealth, resources, means of subsistence…territory…" (Foucault 1991, 93). Because political

ecology specifically addresses how power and knowledge are exercised in environmental governance, it aids in examining how political subjects are constituted through "apolitical" practices of actors in power.

These theses are supported by the numerous cases, complied by political ecologists and other scholars concerned with the ways in which conservation agendas have affected the livelihoods of resource users in different places and contexts under recent forms of environmental governance (Peet and Watts 2004; Zimmerer 2004; West and Brockington 2006; Zimmerer 2006b; Li 2007b; Goldman, Nadasdy, and Turner 2011). The relationship between conservation and resource users has intensified with the "third wave" of conservation and development initiatives, as discussed earlier, and has the ability to significantly alter peoples' interaction with one another, and their environments, and ultimately impact livelihoods (Goldman 2005; Turner 2006; Zimmerer 2006b; Zimmerer 2006a).

The recent hybrid, or decentralized, forms of resource governance that have emerged with the "third wave" in the past two decades are loaded with categories that are prerequisites for the governability of resources and people (Foucault 1991; Scott 1998; Goldman 2004; Li 2007b). These new governance categories include extractive reserves, co-managed protected areas, and community-based conservation. People affected include traditional people, indigenous groups, extractivists, forest dwellers, community fishers, and artisanal fishers, among others (Goldman 2004). These categories of resource governance and identities are elements of efforts "to preserve 'sustainability', 'community' or 'nature'" in the thesis of conservation and control.

In other words, institutions of hybrid environmental governance rely upon discourse loaded with categories (Peet and Watts 2004). These popular discourses are also comprised of notions of "improvement" and how conservation and development agendas improve livelihoods, and ensure well being of people living in or near protected areas (Zimmerer 2006b; Li 2007b). But rather than "improve" livelihoods, conservation agendas often "impinge" on the activities of resource users (Zimmerer 2006b). Further, imposing conservation discourse on resource users results in the reinforcement of social inequalities that already exist and threatens livelihoods (Robbins 2012; Zimmerer 2006b). The point here is that a good deal of literature, cited in the above text, demonstrates the contradictions between what conservation and development is said to do and what it actually does; a major concern in political ecology. This dissertation contributes to these concerns, and the body of knowledge of the interface between conservation and resource user livelihoods. I now turn to discussion of the governance assemblage analytic which was critical to the outcome of this dissertation.

1.3.2 Governance assemblage analytic

With a political ecology lens, I adapted anthropologist Tanya Murray Li's (2007a) governance assemblage analytic, which aids in explaining relationships of power in environmental governance. For Li, the practice of assemblage is a "technology of government" and defined as "the on-going labour of bringing disparate elements together and forging connections between them" (Li 2007a, 263). This advances Ferguson's (1994, xvi) work in development studies that examine how ideas of a

particular intervention are "generated in practice," put to use, and the social and political effects produced.

Li's (2007a) framing draws from Foucault's governmentality which involves getting people to act in a way they believe is in their own interest, and the practice of governing "men in their relations with things…wealth, resources, means of subsistence…territory…" (Foucault 1991, 93) as quoted above. Governmentality, Dean (2013) posits, is both a practice of government and analytical lens, as Li (2007a) demonstrated in her work. Specifically, Li (2007a) draws from Foucault's analytical focus on governing devises, or *dispositif*: "'a system of relations between elements' which include 'discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions' and which form a 'heterogeneous ensemble…the said as much as the unsaid'" (Dean 2013, 50). These elements are assembled "to address an 'urgent need' and invested with strategic purpose" (Li 2007a, 264). The assemblage then, comes together through an array of power relations in which power is productive, and diffuse in its capillary forms (Dean 2013), and not necessarily practiced through an obvious centralized point or totalizing plan of the State as posited by Scott (1998).

Li's (Li 2007a) framework demands examination of several specific "elements": socially situated subjects (resource users, government and NGO officials, private actors); objectives (sustainability, biodiversity, conservation, community, improvement); and things (natural resources, documents, discourses, institutions, knowledge). There are six "generic practices" that bring the assemblage together. These are: "forging alignments,

or the will to govern as a point of convergence and fracture; rendering technical, or framing the arena of intervention; authorizing knowledge, or assimilating science and containing critique; managing failures and contradictions; anti-politics; and reassembling." The framework prompts the asking of *how* and *why* questions, specifically, *who* is setting objectives, *how*, and for what ends or *why*, and what are the outcomes? Further, a feminist lens here includes women as distinct actors in assemblages because development agendas often overlook their role and knowledge, and how livelihoods are gendered (Rocheleau 1995; Carr 2008; Rocheleau 2011).

Foucault's (1991) thesis of governmentality is a significant concept in political ecology (Robbins 2012) as mentioned earlier. Yet, Li also draws from Marx to address the relationship between the state and capitalism, or the contradiction between meeting the needs of capitalism, and welfare of citizens. As Sack (1986, 163) states "capitalism makes government on the one hand its handmaiden and on the other the champion of the system's victims."

Using the analytic, Li (2007a, 2007b) was able to show how development and conservation played out in the Sulawesi, Indonesia, and how livelihoods, identities and landscapes were shaped throughout the process; and how community forest management is complex and contradictory denouncing many myths about small-scale producer livelihood production, such as "blaming the victim' for environmental degradation. In Chapter III of this dissertation, I deploy the governance assemblage analytic with substantial results, which contributes to Li's (2007b; 2007a) few cases applying this specific analytic. This may be conceived as a bold attempt at a sophisticated framing.

However, Li's elaborate but practical tool not only provides seamless engagement of the discursive and material practices of power and territoriality in environmental governance; it is a scaffold for examining the reproduction of conservation and development processes across geographic scales in divergent contexts in an era of environmental globalization.

1.3.3 The livelihoods approach

I relied upon a specific ontology and epistemology of livelihoods, starting with a definition of livelihoods as "the ways in which people transform several types of household capital assets (natural, human, financial, physical, cultural, and social) into livelihood outcomes" (Bebbington 1999; Bebbington et al. 2006, 1962), and their ability to prevent, or recover from, exogenous "stresses and shocks" (Carney et al. 1999). I apply an adapted capital assets approach in which household assets are examined through the relationships between them and among households and broader processes and networks of power (Bebbington 1999; Ellis 2000 ; Kaag et al. 2004; King 2011; Carr 2013) because livelihoods are co-produced discursively and materially through relationships of power and negotiation (Carr and McCusker 2009). As King (2011, 298) posits, "capital assets, social relations and organisations, institutions and access are identified as important variables to most livelihood analyses" (King 2011, 298). In this way, the flaws of simply documenting assets without addressing issues of social inequality (O'Laughlin 2004), and divorcing household material assets from social

processes and networks (Carr 2013; King 2011) is avoided. Furthermore, the livelihoods approach "makes no assumptions about 'community'" (Allison and Ellis 2001, 385).

Several studies have shown how the household capital assets approach is advantageous for determining resource user livelihood strategies, and the implications of these strategies for conservation and development agendas (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004; Carr and McCusker 2009; Lansing 2009; Walker and Robinson 2009; Chowdhury 2010; King 2011; Carr 2013). More specifically, the approach is a basis for examining social processes at the household scale, and provides insight into how new resource management policies differentially effect households.

For example, in Honduras, household social capital through kinship networks and informal institutions shaped marine resource extraction that conflicted with management spaces of an MPA and "fails to find expression in the management plan" (Lansing 2009, 49). Walker and Robinson (2009) found that 87% of fisherfolk in an MPA study in French Polynesia lost access to prior fishing grounds and resulted in differential social consequences as younger fisherfolk with fewer assets were unable to travel as far for fishing in open areas.

Scholars have also applied analytical techniques to develop household typologies based on patterns and correlations among household asset variables. For example, in the Peruvian Amazon, constraints to resource extraction and handy-craft production were differential between households; younger households lacked access to the resource with a land constraint whereas older households had land but lacked time (Coomes 2004).

Another study showed charcoal dependent households lacked land and labor whereas charcoal specialized households were "older, larger and wealthier" and had more communal labor and land (Coomes and Burt 2001, 47). McSweeney's (2004) study in Honduras showed household assets such as household age, access to labor and land not only determined household dependency and specialization in forest products but also their ability to overcome risks and shocks by commercializing products. Finally, in Mexico, Chowdury (2010) developed household typologies based on land use strategies and argued that environmental policies may not succeed if differential household land use strategies are unaccounted for in policy development.

In short, the capital assets approach has been promoted as a means to inform policy in achieving livelihood goals of conservation and development agendas (Allison and Ellis 2001). The livelihoods ontology and epistemology are significant to this research because resource-user livelihood strategies influence, and are influenced by, governance of RESEX. I determined this relationship in this research by examining livelihood strategies at the household and across scales (Zimmerer 2004) through the governance assemblage analytic, described above, in which household livelihood assets are actors/agents within the assemblage.

This provides for a distinct link between conservation and development agendas and livelihoods, and explicit approach to examining the likelihood of RESEX/MER effectiveness in achieving livelihood goals. This is a novel approach to the study of RESEX, in a novel setting, as the Cassurubá RESEX is comprised of terrestrial and

marine spaces and respective livelihood systems. The livelihoods approach in the case of this research is demonstrated in Chapter IV of this dissertation with significant results.

1.3.4 Discourse analysis

As noted earlier, political ecology provides a critical lens for examining discourse as a powerful devise in environmental governance and the material effects it produces because environmental discourses are "contextual, contingent, contradictory, politicized, and highly negotiated" (Mels 2009, 391) and "in political ecology things are rarely what they appear" (Robbins 2012, 124).

Political ecologists tend to fuse Foucaultian and Marxist views in examining environmental discourse. Whereas Foucaultian approaches to discourse typically examine the production of identities, subjects and subjectivities through discourse, Marxist approaches perceive discourses as "devises of abstraction vital to capitalism's production of nature" (Mels 2009, 391). This bridging provides a means to capture how people's identities and livelihoods are constituted through their social relationships, and relationship with the biophysical environment as "places, and the material landscapes they encompass, may have a bio-physical reality but are also constructed and interpreted differently by an individual or group based on past, present and future desires and experiences" (Vadjunec, Schmink, and Gomes 2011, 76). In other words, discourses are "institutionally based, materially constrained, experientially grounded manifestations of social and power relations" (Harvey 1996, 80) and shapes humans, their relations, and the biophysical environment (Mels 2009).

Ontologically, discourse is "language use relative to social, political and cultural formations. It is language reflecting social order but also language shaping social order, and shaping individuals' interaction with society" (Jaworski and Coupland 1999, 3; Clarke 2005, 147). Epistemologically, discourse analysis is the analysis of "discourse as practice" (Arts and Buizer 2009, 342), the analysis of "language in use" (Hajer 1995; Jaworski and Coupland 1999), and the ideas and discursive language that produce actions and institutions (Hajer 1995). Because discourse is practiced, "discourse and practice must be pried apart" in order to understand relationships of power (Thayer 2000, 208). I also focus on non-dominant discourse of resource users in order to represent discourses that are silenced in an arena of conflict (Clarke 2005, 175). This can provide a means for "voices to be heard," such as women's, that otherwise may go unnoticed (Delaney, McLay, and van Densen 2007, 804) and women's contributions and interests typically go unnoticed in environmental governance studies (Rocheleau 1995).

In cases of conservation and development, discourse is constituted of "livelihoods," "beneficiaries" "community," "participation" and "empowerment." However, the goal to protect "livelihoods" can be seen as "a point of entry for an intervention of a very different character" (Ferguson 1994, 255) in which the state (re)gains control over people, resources and territory. As Agrawal (2005, 166) posits, environmental discourse can be a "technology of power aimed at objectifying individuals."

Hybrid forms of environmental governance comprised of this promising discourse have produced material effects such as facilitate government control over

people and resources through indirect means. It affects resource user livelihoods, creates environmental subjects and erases the control of those employing the discourse. These taken-for-granted discourses have been argued to be weapons of power utilized by hegemonic groups, including environmental NGOs (Escobar 1998; Willems–Braun 1997; Goldman 2004; Li 2007b; Robbins 2012). For example, during rezoning of the Lore Lindu National Park, authorities created traditional use zones and "concepts of tradition would serve to limit what villagers could do in the park" and the "imagined subject was the traditional villager" (Li 2007b, 200, 201). In Willems-Braun's case (1997, 12) case, natives were externally ascribed "traditional" by environmentalists and "'land' was made to appear as 'nature': a space that held no signs of 'culture' and therefore could be appropriated into the administrative space of the 'nation'." These are examples of discourse as abstraction, practiced by hegemonic groups, yet produces material effects.

With regard to production of identities and subjects, as stated earlier, some resource users have "appropriated" the language of conservation actors "to achieve goals consistent with their own interests" at the expense of others (Sundberg 2003b, 51) and have formed new environmental identities while becoming subjects of the state (Agrawal 2005; Li 2007b). Specifically, community based environmental governance, is nothing more than "government at a distance" because people are "not directly controlled" (Agrawal 2005, 178) through centralized means. Rather, they assume environmental subjectivities and do the monitoring and enforcement work of the state (Agrawal 2005; Li 2007b). In other words, "it is already one of the prime effects of power that certain

bodies, certain gestures, certain discourses, certain desires, come to be identified and constituted as individuals" (Foucault 1980, 98). Chapter V of this dissertation contributes to this literature concerned with discourse as power in environmental governance as I problematize the notion of RESEX "beneficiaries."

1.4 Dissertation overview

This dissertation is divided into six Chapters. Following this introduction, in Chapter II, I introduce the study area in coastal Brazil and outline the methodology utilized to answer the research questions staged earlier. I present the research findings in three core chapters.

In Chapter III, I investigate the discursive and territorial practices surrounding establishment of the Cassurubá RESEX. By asking *how* and *why* the RESEX was established, I show that RESEX are operationalized by government actors and are barely understood by resource users with little political power. I rely upon Li's (2007a) governance "assemblage" analytic which examines situated actors and their objectives across scales. I demonstrate that the Cassurubá RESEX was established because of contentious territorial conflict between politicians and environmentalists with the majority of resource users being mere pawns wagered in the territorial game. More specifically, the RESEX came to be established because of mobilization by environmental actors who opposed a potential shrimp aquaculture project (Coopex) proposed in the area. Establishment of the RESEX was laden with controversies and there were many inconsistencies between the RESEX prescription and its

operationalization. I conclude that the RESEX is a territorial instrument of control over people, resources, and relationships in a geographic space. Like Li's (2007a) case of community forestry in Indonesia, assembling RESEX is a complicated task, laden with controversies, in a territorial arena.

In Chapter IV, I examine the livelihood practices and strategies of Cassurubá RESEX resource users and how they compare with newly instated institutions. I aimed to determine if there was dichotomy between market oriented and subsistence based households, and if so, were there differential impacts on resource user livelihoods from establishment of the Cassurubá RESEX and new institutions? I answered these questions adapting the livelihoods capital assets approach (Bebbington 1999; Bebbington et al. 2006) and through analysis of household demographic and capital asset data using K-means cluster and chi square analyses. Three distinct household strategies emerged from the analysis: market oriented, high income; market oriented, low income; and subsistence based, low income. These household typologies intersect with new institutions of the Cassurubá RESEX, leading to the conclusion that the institutions contradict with the livelihood strategies of its resource users. Low income households have lost access to fishing grounds and have experienced financial loss; moreover, new formal institutions have undermined fishermen's extraction diversification strategies and have a diffuse effect on women working in fisheries. Informal rules of land-use have further compromised low income subsistence-based livelihoods. I conclude that livelihood strategies of resource users should inform design and implementation of new institutions to reach livelihood and sustainability goals of MERs in Brazil and elsewhere.

In Chapter V, I problematize the notion of RESEX "beneficiary." RESEX resource users are deemed RESEX "beneficiaries" who will be empowered and have access to resources, politics and economic incentives from RESEX establishment. This sounds too promising, however, and things are not always as they appear to be. Using a political ecology lens, I examine the RESEX "beneficiary" in discursive and material terms using ethnographic methods and discourse analysis (Mels 2009). I ask *how* and *why* RESEX "beneficiaries" have been produced and how have resource users contested or adjusted to the status of "beneficiary." I show how the act of abstracting resource users as "beneficiaries" disembodies the gendered livelihoods that have been embedded from social relations and relationships with the environment for generations, and constitutes them subjects of actors in power. Resource user livelihoods have been reconstituted as "beneficiaries" and their relationship with the environment is changing, as they become artifacts of RESEX. Further, the majority of resource users do not perceive themselves as "beneficiaries," but harmed by the RESEX, and they perceive NGOs as having benefitted the most. This has led a few resource users to take on the RESEX ideology and situate themselves in positions of power, contributing to decisions that inadvertently impact themselves and hundreds of other resource users, including women. I conclude that "beneficiaries" are an "imaginary collective subject" produced by government actors (institutions and officials) that renders the appropriation of land, and expansion of bureaucratic state power, invisible (Ferguson 1994, 280).

Chapter VI summarizes the key findings of this research and relates them to the literature and conceptual framings discussed in this chapter. Specifically, a summary of

the dissertation and the conclusions are presented, followed by theoretical contributions. These are scholarship of environmental globalization and the intersection conservation of conservation and livelihoods (Zimmerer 2006b; Zimmerer 2006a; Robbins 2012); Li's (2007a) governance assemblage analytic as a tool for examining environmental governance and relations of power; scholarship of RESEX/MERs in Brazil (Da Silva 2004; Glaser and Oliveira 2004; Di Commo 2007; De Moura et al. 2009) and effectiveness in sustaining livelihoods (Browder 1992; Salisbury and Schmink 2007; Maciel et al. 2010; Vadjunec, Schmink, and Gomes 2011); and the livelihoods approach in this research and as utilized by other scholars (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004b, 2004a; Carr and McCusker 2009; Lansing 2009; Walker and Robinson 2009; King 2011). This is followed by an examination of the RESEX instrument and recommendations for policy makers, and finalizes with recommendations for future research.

CHAPTER II

STUDY AREA AND RESEARCH METHODOLOGY

In this chapter, I describe the research study site by explaining the biophysical environment, presenting the various stakeholders of the Cassurubá RESEX, and providing a brief socio-economic history of the area. I then present the research methodology of data collection and analysis followed by a discussion of my positionality in the research.

2.1 The biophysical environment of the Cassurubá RESEX

The Cassurubá RESEX in southeastern Bahia, Brazil was created in 2009 by presidential decree. The RESEX is comprised of 100,687 hectares of coastal, mangrove, estuary and marine habitats (CI 2011; SNUC 2011) with the majority of the polygon overlapping with the municipalities of Caravelas and Nova Viçosa (populations 21,437 and 38,537 respectively) (IBGE 2010). A small portion overlaps with the municipality of Alcobaça to the north (Figure 2.1). The region is a priority area for terrestrial and marine conservation in Brazil. The terrestrial landscape is within the Atlantic Forest (Mata Atlântica) Biodiversity Hotspot. The coastal and marine biodiversity include extensive coastal mangroves, among the most intact in the country, that serve as nurseries for species, such as the goliath grouper (*Epinephelus itajara*), and dog snapper (*Lutjanus jocuthat*), that inhabit the most biodiverse reef system, the Abrolhos Bank (or Arquipélago de Abrolhos) in the Southern Atlantic (CI 2011; SNUC 2011). Accordingly,

the establishment of terrestrial and marine ecological corridors, or protected area networks, is a major goal of the government and non-government organizations (NGOs) working in the region.

2.2 Situated subjects of the Cassurubá RESEX

2.2.1 Non-government organizations (NGOs)

Several NGOs are based, and work, in the region. These include Conservation International (CI), focusing on marine conservation in general with goals of expanding the Abrolhos Seascape; Ecomar, which focuses on goliath grouper conservation and ecotourism in the immediate Cassurubá RESEX area; Instituto Baleia Jubarte (IBJ), which specializes in humpback whale research as 11,000 migrate to the Abrolhos annually; and SOS Abrolhos, a coalition of these NGOs and other partners. There is also Arte e Manha which is a cultural movement center focused on afro-indigenous culture of the region, however, the leader was strongly engaged in RESEX establishment. He acted as intermediary between RESEX authorities and resource users, and he has contributed the artwork used for RESEX documents, posters, maps, booklets and meetings. As will be explained in the following chapters, authorities of these NGOs played a major role in establishment of the Cassurubá RESEX and are continuously engaged in RESEX governance processes as they hold seats on the deliberative council of the RESEX.

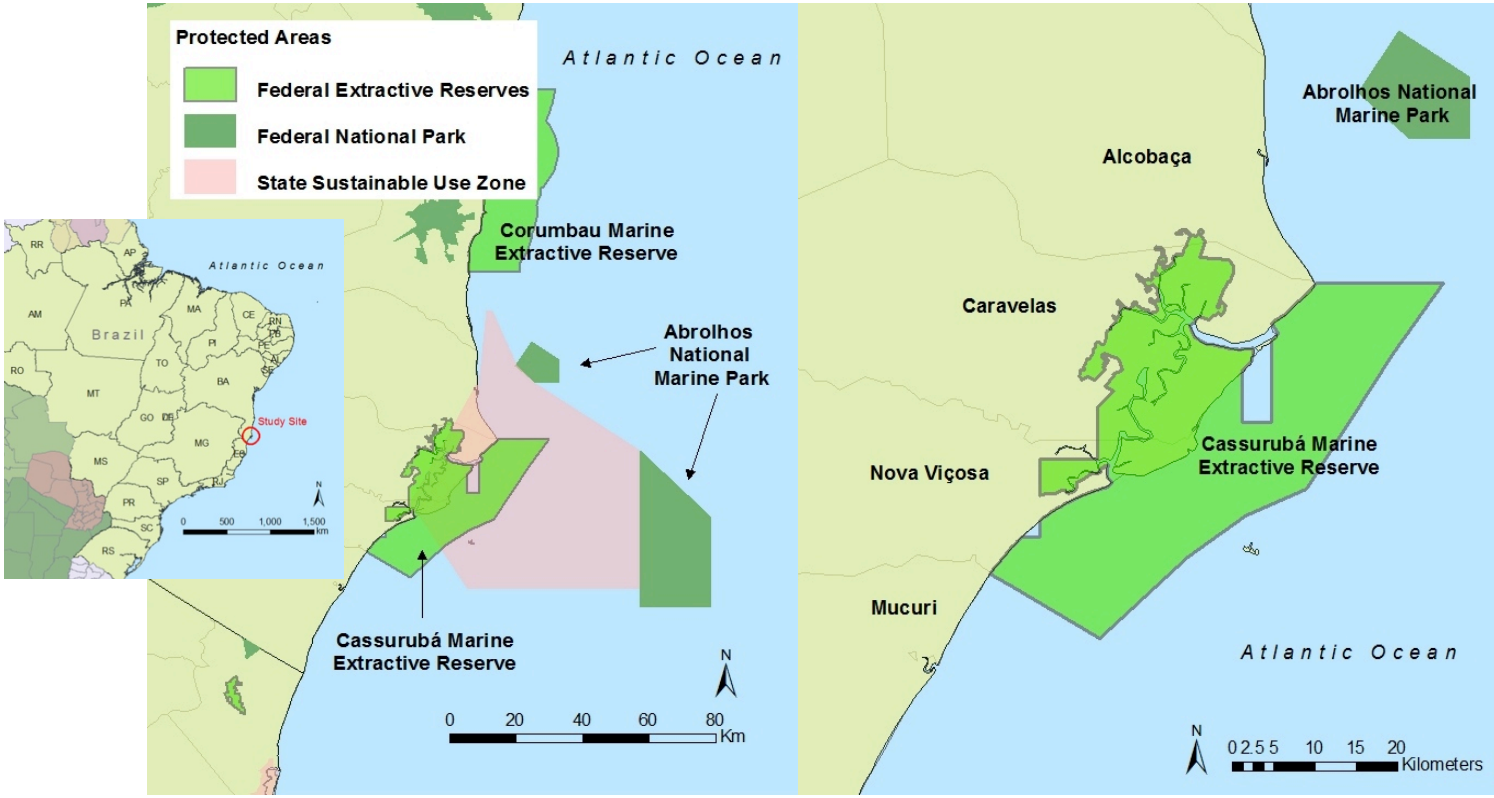

Figure 2.1 Study region and area in Bahia, Brazil. Data source: MMA/IGBE geo-reference data: www.mma.gov.br.

2.2.2 Government actors

The main government officials of the RESEX are of the Chico Mendes Institute of Biodiversity (Instituto Chico Mendes de Conservação da Biodiversidade, ICMBio). As will be discussed in Chapter III, each RESEX has a manager who is an ICMBio official who directs, and oversees, all RESEX processes and acts as intermediary between the Federal government and local processes. IBAMA, The Brazilian Institute of the Environment and Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais) also has a strong presence in the area and mainly conducts monitoring and enforcement. CEPENE, the Center for Research and Management of Fishery Resources of the Northeast (Centro de Pesquisa e Gestão de Recursos Pesqueiros do Nordeste) has also played a major role in RESEX processes. CEPENE has conducted biological research in the area for over a decade, focusing on mangrove and marine species. The main official of CEPENE is a former IBAMA employee who also played a major role in the creation of the Cassurubá RESEX and continues to do so as a deliberative council member.

2.2.3 Fibria eucalyptus firm

Fisheries are the main source of income in the immediate area of the Cassurubá RESEX; however, the global cellulose market has a presence in the area. Fibria, formerly Aracruz Cellulose, built a maritime port in Caravelas in 2003 to meet the increased demands for cellulose. Fibria, the largest producer of eucalyptus in the world, produces 5.2 million tons per year from Eucalyptus plantations that dominate the

surrounding landscape of the Cassurubá RESEX. Barges (Figure 2.2) transport the eucalyptus timber from the Maritime Port in Caravelas to Fibria headquarters in Espirito Santo State. In order to accommodate the barges, which are 114 meters long and hold up to 5 million m^3 of timber, Fibria has dredged a canal (Canal do Tomba), since 2003, to access the Caravelas River where the port is based and 250,000 m^3 of sediment is dredged annually (Andrade no date). Fibria generates R$3 million per year for monitoring of dredging activities and social-environmental programs as environmental mitigation for its activities (SulBahiaNews 2013). Government and NGOs that have tapped into Fibria funds include CEPENE, ICMBio, Ecomar and IBJ.

Figure 2.2 Eucalyptus barge at Fibria's maritime port in Caravelas (August 2013)

2.2.4 Resource users

The Cassurubá RESEX area is home to "traditional" and artisanal fishing communities dependent upon marine resources for food and income (Begossi 2006; Diegues 2008). The RESEX polygon covers terrestrial and marine spaces; therefore, resource users engage in diverse livelihood activities as fisherfolk (*pescadores*), shellfish extractors (*marisqueiros*), and riverside dwellers (*ribeirinhos*) or (*moradores*) who conduct small-scale subsistence, and minor profit, farming as (*lavradores*).

Most of the fisherfolk, and many shellfish extractors reside in the peri-urban areas of Caravelas and Nova Viçosa, located outside of the RESEX polygon (Figure 2.1). It is important to note that the term peri-urban is utilized here because these "urban" areas are not typical large urban centers. They are small, historic centers with basic infrastructure such as electricity, potable water, buses and roads, and are densely populated relative to more rural areas such as the terrestrial area of the Cassurubá RESEX. Nonetheless, the peri-urban resource users include *pescadores* who mainly extract shrimp and drum along the shore, bonito in the open sea, reef fishes such as grouper and snapper, in motorboats. They also extract river fishes such as snook and catfish. The shellfish extractors are men and women (*marisqueiros/as*) who extract soft-shell crab along the shore, and cross over to the terrestrial area to extract species such as mangrove crab, blue land crab and mollusks, in rowboats or canoes. Also, most women as shell-fishers (*marisqueiras*) work cleaning shrimp for the various fisheries located in the peri-urban areas. Vessels used in the Cassurubá RESEX are displayed in Figure 2.3.

Figure 2.3 Vessels of the Cassurubá RESEX. From top to bottom: a canoe, rowboat, and motorboat.

The *moradores* residing in the *zona ribeirinha*, are within the terrestrial area of the RESEX polygon, which is comprised of 11 islets carved out by ten, surrounding tidal rivers. These rivers are Rio do Caribé, Rio do Massangano, Rio do Macaco, Rio do Jaburuna, Rio Cupido, Rio do Poço, Rio do Largo, Rio do Nova Viçosa, Rio do Barra Velha, and the larger Rio Caravelas (Figures 2.4 and 2.5). This terrestrial area extends from Caravelas in the north to Nova Viçosa in the south; encompassing approximately 20 km. Residents of the Cassurubá "islands" are geographically isolated and must access the peri-urban centers by boat. To access the peri-urban centers it may take anywhere ranging from 1 hour and 30 minutes to 4 hours by boat along the rivers, depending upon the type of motor, and the tide and geographic location. From Nova Viçosa to Caravelas, it is 125 km by car (~1 hour and 40 minutes).

Moradores live in rustic conditions; most homes are made of clay with tin roofs, there is no potable water, no basic sanitation; and electricity is solar powered and only powerful enough for lighting and charging small gadgets, therefore there is no refrigeration (Figure 2.6) Water is acquired from freshwater springs through wells and typically carried to washing areas by women, for dishes and laundry, outside of the home. However, not all sites have access to freshwater springs nearby and many must walk up to ¼ miles to obtain water. These *moradores*, or *ribeirinhos*, both men and women, conduct diverse livelihood activities. They fish in the river, extract crustaceans and mollusks from the mangroves, conduct small-scale farming activities mainly for subsistence, and small-scale livestock cultivation, as will be discussed below and in detail in Chapter IV.

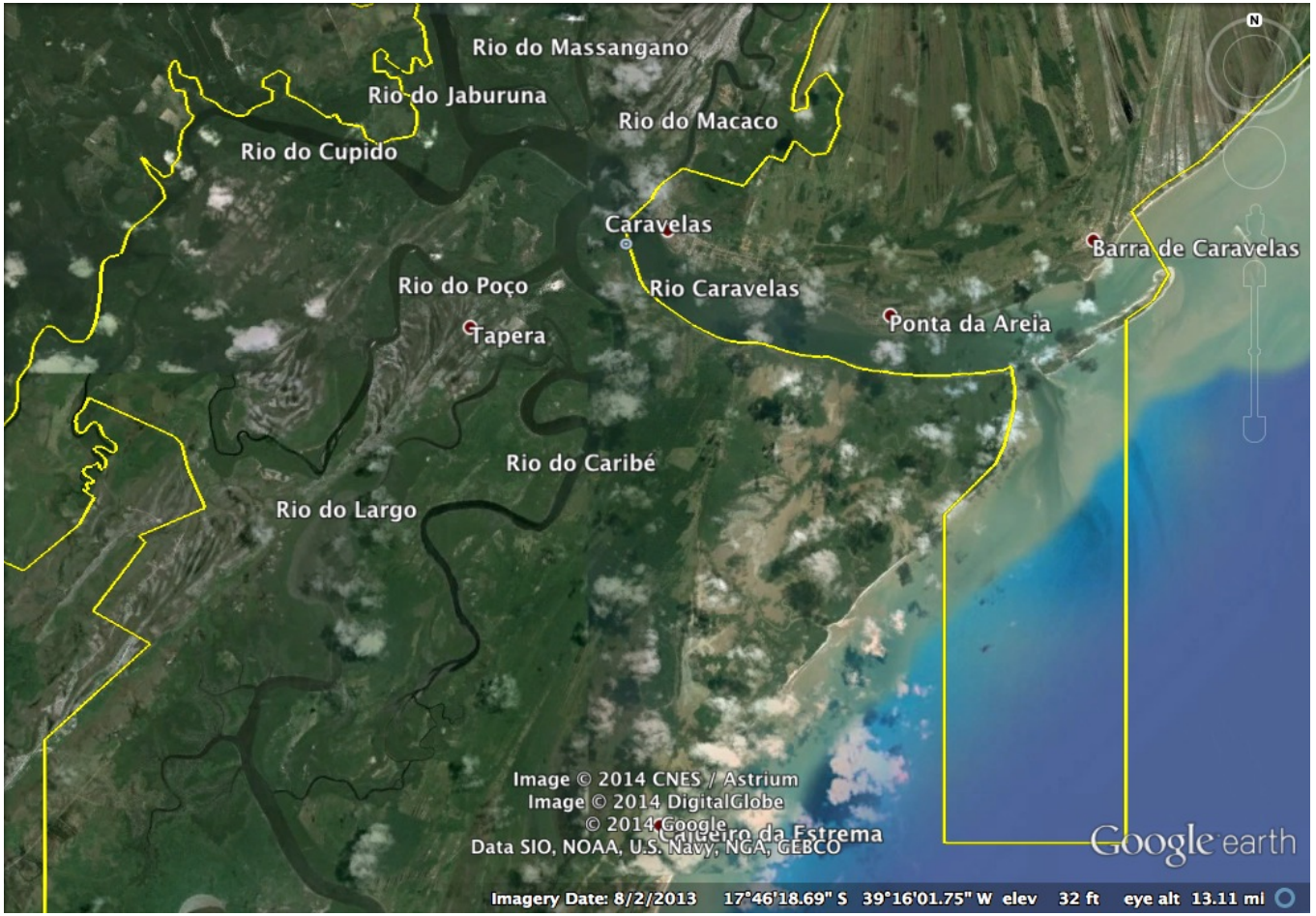

Figure 2.4 Tidal rivers of the northern area of the Cassurubá RESEX

Figure 2.5 Tidal rivers of the southern area of the Cassurubá RESEX

Figure 2.6 A typical home in the *zona ribeirinha*. Note the outdoor washing area to the right of the home (August 2013).

2.3 A brief social, cultural and economic history of the area

The *zona ribeirinha* has been inhabited for centuries (Ralile 2006). The non-inundating fertile soils attracted people from the surrounding area who farmed staple foods including sugar cane, beans, corn, squashes, rice, coffee, bananas, coconuts and manioc, the latter of which remains a staple food today in the form of manioc flour (*farinha*). Both men and women engaged in farming and manioc flour production. They also caught snook, catfish, snappers and other fish in the rivers, and extracted abundant crustaceans and mollusks including oysters, mangrove crab, blue land crab, and clams.

They constructed their own fishing gear, such as nets, and carved canoes from large trees, including mangoes and jackfruit, that were planted generations before.

Over 1,000 inhabitants once occupied the area, rich in resources, and quality of life, and even soccer games (Ralile 2006) and festivals were regularly held. Residents of the municipalities of Caravelas and Nova Viçosa also seasonally farmed land they possessed in the *zona ribeirinha*. However, the number of residents reduced in time to 700, and now ~250 households, with migration to the peri-urban areas of Caravelas and Nova Viçosa in the last century; young adults were in search of better lives and older adults wanted their children educated (Ralile 2006). Schools were not constructed in the *zona ribeirinha* until 2001. Prior to this, residents were without education because it was too difficult to access the peri-urban centers in canoes and rowboats and they chose to work, or had to work, for sustenance.

Those that remained in the *zona ribeirinha* have continued their livelihood practices of farming, and extracting and fishing from the mangroves and river, extending to five generations. Many resource users have resided in the peri-urban centers and farmed the land seasonally on weekends as their antecedents did before. The livelihood systems of the *zona ribeirinha* and urban areas have been woven for generations as *ribeirinhos* would sell and trade their produce in exchange for food proteins and utilitarian goods with residents of the peri-urban centers at the weekly Saturday market, a practice that still exists today. In the mid twentieth century, however, produce was even sold to naval officers, whose ships were docked in the Caravelas River, and merchants of the Bahia-Minas railroad (Ralile 2006).

The rich resources of Caravelas, Bahia and its surrounding area have been exploited for centuries, ever since Portuguese settled the town in 1581. Humans have transformed the landscape for hundreds of years. Caravelas was once the largest producer of coffee in the State of Bahia and main whaling port (Nicolau 2006). Most of the region was deforested by the mid-twentieth century, as timber was exported by the Bahia-Minas railroad which transferred timber and other resources from Caravelas to the mining State of Minas Gerais until 1966 when the railway was shut down (Nicolau 2006; Ralile 2006). Cattle ranching was also a major industry in the area in the subsequent years, and continues to be (Nicolau 2006).

More recently, most of the landscape, which was Atlantic Forest, has been transformed into Eucalyptus plantation because of the activities of Fibria (formerly Aracruz), the largest producer of Eucalyptus in the world. In the 1990's Koopmans reported that Aracruz owned 43% of the land in Caravelas (Mello 2007). The human influence on the landscape was also evident in the terrestrial area of the Cassurubá RESEX, or the *zona ribeirinha*, as Ralile (2006) reported that only one of these "islands" (Caribé) did not contain monoculture plantations of eucalyptus. Today, large plantations of Eucalyptus border the RESEX to the north and west virtually forming its boundary. When the RESEX was delineated these areas had to be excluded as they were privately held lands.

Another major, and recent, economic activity is tourism of the Abrolhos National Park (est. 1983), because Caravelas is the closest departing point for tour boats. However, tourism dropped drastically in the past ten years, and ever since the Caravelas

airport stopped servicing passengers. The nearest airport to Caravelas is in Porto Seguro to the North, and is a four-hour drive by car (252 km). Therefore, the municipality is somewhat isolated from larger urban centers and with relatively low accessibility. Notwithstanding, Abrolhos tourism has contributed little revenue to Caravelas and its residents since the foreign tour-boat operators gain the major profits. In addition, Caravelas infrastructure in terms of catering to tourists is poor. The historic area is in dire need of renovation, and hotels are in very poor condition. Therefore, most locals rely on fisheries for their main source of income, as noted above, and will be discussed more thoroughly throughout this dissertation.

2.4 Data collection

2.4.1 Data collection overview

Data collected in this research relied upon qualitative and quantitative methods specifically informed by Li's governance assemblage analytic (2007a) and the livelihoods approach (Bebbington 1999; Bebbington et al. 2006) as will be discussed below. Data was collected in July and August (six weeks) in 2011, and between January and December of 2013. All interview respondents are referred to with codes and data collection followed Texas A&M University IRB protocols for research on human subjects. Protocol for participant confidentiality was adhered to throughout the research with attention to ethical and moral implications for the study participants. Table 2.1 summarizes the interview respondents of this research.

Table 2.1 Summary of interview respondents

Stakeholder	**Institution**	**Respondents**
Government	ICMBio	1
	CEPENE	2
	Ministry of Environment	1
	Municipality	1
NGO	Ecomar	3
	CI	2
	IBJ	1
	Arte Manha	1
Association	Resource user associations	5
	Colonia de Pesca	3
Resource user		137
Total		**157**

2.4.2 Qualitative data collection

Qualitative data collection relied on Li's (2007a) "practices of assemblage" governance framework, explained in Chapter I. The governance assemblage analytic adapted to this research demanded examination of several specific "elements": socially situated subjects (fishermen and women, shellfish collectors, residents, government and NGO officials, private actors); objectives (livelihoods, sustainability, biodiversity, conservation, culture, economy); and things (MER forest and marine resources, documents, discourses, institutions, knowledge) and six "generic practices" that bring the assemblage together. Li's analytic adapted to this research is displayed in Table 2.2 and example interview, and general, questions in this research, based on the framing are displayed in Table 2.3. Qualitative data was collected by three means as follows.

First, semi-structured interviews were conducted with purposively sampled key informants including government and NGO officials and resource users (n=20) using the snowball method (Hay 2010). Respondents were asked; why the RESEX was created and who was involved; about their participation in establishment of the Cassurubá RESEX; how they perceived the RESEX; what were the major threats in the area; and who were RESEX beneficiaries among other questions.

Second, as part of a household survey, discussed in more detail shortly, semi-structured questions were administered to 137 resource user households (15 as a pilot in 2011, and 122 in 2013). Respondents were also asked; about their participation in establishment of the RESEX; their perception and knowledge of the RESEX; their involvement in RESEX meetings; how they identify; whether or not they were content with their livelihoods; and if they were beneficiaries, among other questions as shown in Table 2.3, based on the assemblage framework.

Third, participant observation was conducted in six RESEX meetings; with seven resource users during their daily livelihood routines including, but not limited to, shrimp cleaning, repairing nets and boats, unloading catch, shellfish extraction; and in public spaces such as boat docks where fisherfolk congregated when they were not out extracting resources.

Fourth, texts were examined including government and NGO reports, legal documents, historical documents and other text and media relative to RESEX and Cassurubá RESEX creation, and the area. These documents were coded and analyzed

with ATLAS.ti software as explained shortly. The results of this data collection are mainly presented in Chapters III and V of this dissertation.

Table 2.2 Adapted governance assemblage framework

Example "Elements" of the Cassurubá RESEX		
Socially situated subjects	*Objectives*	*Things*
Moradores/as *Pescadores/as* *Marisqueiros/as* Government officials NGO officials Private actors, others	Livelihoods Biodiversity Conservation Sustainability Culture Economy	Forest and marine resources Documents Discourses Institutions Knowledge
Example "Generic Practices" of the Cassurubá RESEX		
Forging alignments: Partnerships have been formed between government, NGOs, private actors and resource users to create the RESEX.		
Rendering technical: Problems have been defined such as overfishing and unsustainable land-use, and poverty, in addition to other "lacks" in the Cassurubá RESEX.		
Authorizing knowledge: Science is applied to participation and organization problems. RESEX officials deploy community, organization & participation.		
Managing failures Re-delineating the RESEX because of political-economic conflict. Redefining and reregistering RESEX beneficiaries. Managing conflict.		
Anti-politics: Setting agendas and closing debates. Deliberative council meetings and practices of power.		
Reassembling: Reassembling land, livelihoods and labor.		

Table 2.3 Example research questions drawn from the assemblage analytic

Socially situated subjects	**Interview questions**
Pescadores/a *Marisqueiros/a* *Morador/a* *Lavrador/a*	*Livelihoods* • Do you consider yourself a [one of these identities]? Why or why not? • What does it mean to be a [one of these identities]? • How long have you been a [one of these identities]? • What resources are most important to your livelihood? Why? • Did you make any agreements or sign any documents related to the Cassurubá RESEX?
	Governance • Did you participate in creation of the Cassurubá RESEX? If so, why or why not? • Do you/did you participate in meetings for Cassurubá RESEX? If so, why or why not? • Do you know the rules of the Cassurubá RESEX? • Have you seen a map of the Cassurubá RESEX? Do you know its area? • Are you a beneficiary of the Cassurubá RESEX? Why or why not?
Government officials NGO officials Private actors Other	*Governance* • Why was the Cassurubá RESEX created? • Who was involved in creation of the Cassurubá RESEX? • What was your involvement in creation of Cassurubá RESEX? • What are the major threats/issues in the area? • What are the objectives of the Cassurubá RESEX? • Who are RESEX beneficiaries?

Table 2.3 Continued

Objectives	**General questions and examination of texts and discourses**
Livelihoods Biodiversity Conservation Sustainability Culture Economy	*Governance and Livelihoods* • How are livelihoods conceptualized via the RESEX instrument and how does that compare to the actual livelihoods of resource users? • Whose objective is biodiversity conservation and sustainability? • How is culture perceived in the area? • Who is defining economic goals for the Cassurubá RESEX? • What economic processes are at work in the Cassurubá RESEX?
Things	
Resources Documents Discourses Institutions Knowledge	*Governance and Livelihoods* • What role do these "things" play in socio-political processes of the Cassurubá RESEX? • How do "situated subjects" of the Cassurubá RESEX perceive RESEX resources? • How have processes become institutionalized for RESEX? • How have institutions affected RESEX processes? • What are the dominant discourses and knowledge surrounding the Cassurubá RESEX?

2.4.3 Quantitative data collection

As stated above, a household survey was administered to 137 resource user households (15 as a pilot in 2011, and 122 in 2013). A major component of the survey was designed to collect data for statistical analysis guided by other studies adapting the livelihoods approach (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004b; Chowdhury 2010). For statistical purposes, the sample size during 2013 was determined by the estimated number of resource user households (~2000 fisherfolk and ~250 resident households) totaling ~2250, and methods used for statistical analysis. The "ratio of observations to independent variables should not fall below five," with ten being the optimum ratio (Bartlett II, Kotrlik, and Higgins 2001, 48). Therefore, with 12 independent variables, the optimum sample size is ~112 households.

However, absolute randomization was not possible because lists of resource user households were not available and residential addresses do not exist in most of the area. Therefore systematic sampling was conducted. One in every 5 fisherman/woman was approached in all fishing communities of the peri-urban areas. For the resident households of the terrestrial area of the RESEX, a Google Earth map was produced, houses were counted and numbered, and every 5th home in the terrestrial RESEX area was approached. Each community, and the terrestrial area, was sampled for four-week periods in order to capture those individuals not present the previous day/s. All community areas were sampled except for those along Rio do Jururuna, and Rio do Nova Viçosa because of access issues and loss of research time. Nevertheless, the

sample is sufficient to represent households of the *zona ribeirinha*, and the sample of 122 represents approximately 5% of the household population of resource users of the Cassurubá RESEX as recommended by Bartlett II, Kotrlik, and Higgins (2001).

Household demographic data was collected and respondents were asked; to report the top five species targeted and habitat extracted from (from most to least important); gear used and value; average monthly catch, selling price and to whom sold; boat type, ownership and value; and average percent of catch kept for consumption versus sales (of each species), for the year 2012, among other questions. They were asked to report their average monthly incomes, and the jobs and incomes of those working in the household for the year. Household incomes were then calculated, based on Brazilian minimum wage at the time of the study (R$678 monthly, ~US$340), for data analysis. Respondents were also asked; about their participation in establishment of the RESEX; their perception and knowledge of the RESEX; their involvement in RESEX meetings; of the major threats in the area; how they identify; whether or not they were content with their livelihoods; and if they were beneficiaries, among other questions. The administered household survey is listed as Appendix A, and the results of the household survey are presented Chapter V of this dissertation.

2.5 Data analysis

2.5.1 Qualitative data analysis

Qualitative data was analyzed using ATLAS.ti software and relied on the method of coding. The coding of interview transcripts, field notes, and other texts is the process

of "defining what the data is all about," as codes emerge with examination of the data, leading to theoretical categories or themes (Emerson 2001, 341). Line by line coding involves giving a "name" or code to each line in the data, and is followed by focused coding which takes reappearing line codes to create emerging themes/categories and finalizes in theory building (Emerson 2001). Data was coded based on emerging themes, and guided by the themes of the conceptual framing of this research. Specific steps include:

1) Transcribe interview data and enter into ATLAS.ti software, along with other data, documents, texts, and media;

2) Conduct focused coding of data based on conceptual framing, and emerging new categories;

3) Conduct content analysis of coded data by comparing responses and emerging categories, and reanalyzing as new categories emerge; and

4) Develop theories based on dominant categories.

Responses from key informants, household semi-structured interview questions, participant observation data, and texts were analyzed through this method.

2.5.2 Quantitative data analysis

Quantitative data analysis involved statistical tests in order to examine household variation in livelihood strategies. Household characteristics and assets act as predictors for resource dependency or specialization (Coomes and Burt 2001; Coomes 2004; McSweeney 2004b). For example, Coomes' (2004) regression model for constraints to

chambira extraction included land use, labor endowment and household age among predictor variables; and income and chambira use as dependent. McSweeney (2004b, 244) similarly used the dependent variables of sold forest products and percent total earnings from forest product sale, predicted by independent variables of "households' human, social, and physical capital endowments" to determine household dependency on selling forest products.

Specifically, three statistical analyses were conducted, using JMP, SAS Institute Inc. statistical software: K-means cluster analysis, nominal logistic regression, and chi square contingency analysis. First, K-means cluster analysis was performed to differentiate market and subsistence households using data of reported proportion of catch sold (mean % market of top five species extracted) and reported household income from fisheries. Second, nominal logistic regression was performed to investigate which independent variables determined cluster membership. The independent variables analyzed were (Table 2.4): habitat (shore, corals open sea, mangrove and river); type of boat (no boat, canoe, row boat and motor boat); location (peri-urban versus zona ribeirinha); household value of boat and gear; head of household age, education, and years extracting; number of household members; number of male workers and female workers; number of dependents; number of household members and household number of fishing arts.

Table 2.4 Variables tested for statistical analyses

Dependent variables for k-means cluster formation	
1. Percent market based extraction	
2. Household income from fisheries	
Dependent variables for regression and chi-square analysis (emerged from k-means cluster analysis)	
1. Cluster 1 (high market orientation, high income)	
2. Cluster 2 (high market orientation, low income)	
3. Cluster 3 (low market orientation, low income)	
Independent variables for regression and chi-square analysis (HH=Household Head)	
1. Age of HH 2. HH education level 3. HH years extracting 4. # Males working in fisheries 5. # Females working in fisheries 6. # Dependents	7. # Household members 8. # Household fishing arts 9. Household value of boat & gear 10. Type of boat used 11. Habitat extracted 12. Location of household

Third, chi square analysis was performed in order to examine the relationships between the clusters and independent variables in greater detail. Reasons for performing three tests include the fact that the household market sales data were skewed and log transformation of the data did not yield better results. Therefore, multivariate linear regression was not a suitable model. Also, although the logistic regression model yielded significant results ($p< 0.0001$), inference of the parameters was not possible because of the occurrence of separation in the model. Separation occurs when the model fits almost perfectly and parameter estimates are extremely large and not interpretable because of

low response levels, small data sets, and or rare occurrences[1]. Thus, independent chi-square tests yielded the clearest results.

2.6 Positionality and situating the research of the Cassurubá RESEX

2.6.1 Insider-outsider of Cassurubá

During field research I was a partial inside-outsider; part insider, part outsider. My mother was born in the *zona ribeirinha* of Cassurubá and was raised as a *marisqueira*. More specifically, both of my great-grandparents on my maternal side possessed land there. In 2013, my father spoke of a time in the early 1970s when he had visited the area with my mother and speculated on the land owned by my grandparents. He rode across the territory on horseback from the Caravelas River to the Nova Viçosa River in the south and he determined that the property was larger than his native island, Graciosa (60.65 km^2 or 6,065 ha) of the Azores. He consulted an attorney to obtain my mother's portion of the land as an heiress of the land. The attorney told him "it would not be worthwhile because there were too many heirs of the land." My mother later contemplated again about obtaining her share of land in the 1990s, but decided not to because she felt she would be taking land away from people "who did not have anything," so she left it to the other heirs. This is how the story begins, and it will end with, as you will read later, "the land was never theirs to begin with."

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[1] For more information about separation see http://support.sas.com/kb/22/599.html

That said, if I had not been a daughter of a *Caravelense*, I likely would not have achieved what I did in 2011 and 2013. Locals of Caravelas are not very welcoming or trusting of outsiders. Furthermore, resource users and other locals do not trust researchers, particularly those who attempt to interview them. They associate researchers with NGOs, and they associate NGOs with government, and they do not trust government officials. In fact, they hardly distinguish between NGOs and government, as I witnessed, and other scholars (Nicolau 2006; Mello 2007) that conducted research in the area.

When I approached resource users for interviews they were reluctant to consent because they thought I worked for ICMBio, IBAMA, or an NGO. It was difficult to convince them that the research was for my dissertation, even after handing them the Texas A&M, IRB stamped, information sheet. Many of them thought I was a spy for IBAMA and there was one *marisqueira* who thought I was the police. Before the interview she asked me, "are you the police"? I replied no, and explained who I was. When the interview was completed, she asked, "Am I in trouble now?" I reassured her that she was not in trouble as I was not there collecting information for IBAMA. In short, resource users were very skeptical of who I was, and they were untrusting.

I realized that if I did not tell resource users that I was a daughter of a *Caravelense*, they would not trust me and would not open up. Therefore, upon approaching people I would tell them I was conducting research of the RESEX and their livelihoods, but I also added that my mother and grandmother were from Caravelas. Some did not know my mother who had not lived there for many years, particularly

younger people. But most, especially older people, knew my grandmother, who passed away in Caravelas in 2006 at nearly 100 years of age. Her name is Ana Nunes da Silva and she was known as *Pixima Mole*. Most people of the area go by a nickname. *Pixima* is a tidal river mullet and the nickname means soft fish; it is not a very attractive name. Nevertheless, she sold *pixima* as she was a *pescadora* and *marisqueira* who also farmed her land in the *zona ribeirinha*. Just about everyone in Caravelas and many in Nova Viçosa knew my grandmother. It is not a surprise because many residents of the area are related, and I came to unexpectedly meet many second cousins upon interviews.

Resource users, and even key informants, opened up after knowing I was a descendant of Caravelas. I was even told by a *pescador* that I was an heir of the *zona ribeirinha* and that I should "go after my family patrimony." However, I assume the same stance as my mother. Why would I want to take something from people who need it more than I do? I am almost certain that if my parents never moved from Caravelas in the late 1960's I would have become a *marisqueira* because it is virtually the only work for women in the area, as I discuss in chapter V. And perhaps I would be one of these people whose livelihoods are changing.

2.6.2 Subjectivity

Most of my research is subjective and with a partial perspective as with other work in political ecology. As Haraway (1988, 586) posits, "Subjectivity is multidimensional; so, therefore, is vision. The knowing self is partial in all its guises, never finished, whole, simply there and original; it is always constructed and stitched

together imperfectly, and therefore able to join with another, to see together without claiming to be another." In this vein, I am not a resource user who can represent themselves and others from their own situated-ness. Yet, because I was able to "join with," and "see with" them, in a subjective way, I am able to represent them. In other words, as a human, I am never complete, yet multiple, taking on new identities with each encounter with a new individual. I was also better positioned for this as a descendant of the area, raised by my mother who maintained the same cultural values of the area, even while living in Northeastern United States. In summer we gardened, and collected rock crabs, mussels, razor clams, quahogs and periwinkles, and fished flounder, on the north shore in eastern Massachusetts. This was in the mid-1970s before the waters became polluted and it became illegal to conduct such activities. However, that is an entire different story beyond the scope of this dissertation.

I make no claims of being objective in this research because claims of objectivity and ethical neutrality are ideological (Harvey 1974). I do, however, use statistical procedures and attempt to do so without bias. While I am not so proud to reduce humans into statistical figures in part of this research, I believe that applying statistical techniques allowed me to build a stronger argument of how new RESEX institutions impact resource user livelihoods. This is because statistical analyses are highly valued in science and powerful instruments in scientific research.

2.6.3 Research licensing

My ability to conduct fieldwork in 2013 was a long and grueling process. I was also a subject of the RESEX. Research is heavily regulated and includes all research (social and biological) conducted within, or of, the RESEX territory, resources, or people. A license to conduct research on RESEX biological or human resources is required from IBAMA, which is granted only to individuals who are associated with, or employed by, Brazilian governmental and educational institutions. Furthermore, any research to be conducted in a RESEX has to be approved by the deliberative council (the decision-making body) of the RESEX.

I was able to overcome these dilemmas by collaborating with Conservation International (CI) of Brazil in Caravelas. In exchange for being linked to the institution I agreed, as a volunteer, to examine socioeconomic data they had obtained to determine if there was potential for its use in a report or publication. However, the collaboration process did not occur until April 2013. The RESEX manager and CI were hesitant to assist and it took many meetings and discussions to make things move forward for the first few months.

In the meantime I presented my research at a public deliberative council meeting in March 2013 where council members voted and approved of my research. However, there was some resistance; ironically, resistance was not from resource users, but from NGO actors and another scholar who had previously conducted research there. The NGO actor stated that plenty of research had already been conducted in the area and he doubted how my research would help anyone of the RESEX. The anthropologist

questioned my methodology, asking what field I was in, and insinuated that geographers did not know how to conduct ethnographic research. I was told I did not know the people there and I should be careful with what I was doing! Nevertheless, the majority ruled in favor of the research.

The bureaucratic process of the collaboration, as a volunteer, was not completed until May 2013. At this time I applied for the IBAMA license through an online process and I was not approved until June. Therefore, I spent the first half of 2013 unable to conduct interviews, and working on the collaboration, and obtaining the identity documents, such as identification and social security number (CPF) and voter ID card that I needed to apply for the license. For the CPF, I was sent to the next major city (Teixeira de Freitas) over an hour away because the official did not know how to handle a birthplace outside of Brazil. It took particularly long for the voter ID card as the printer in the office did not function for one month. I was being accounted for, and made "legible" as a Brazilian citizen.

During this period of my legibility, the RESEX manager told me that if I conducted interviews without the license it would be illegal and the data would be confiscated. This did not prevent me from frequenting fishing piers and fish markets. I regularly observed landings and the trucks being loaded for export to other cities. As a consumer of seafood I documented the costs of my purchases for the entire year of 2013 to examine fluctuation in pricing. I held everyday conversations with resource users and other locals about weather, tides, fisheries, corruption, history and more. I also took photographs and videos of local public activities and events. Fortunately I was patient

and followed the RESEX manager's specific orders, and I did not give up, as some people suggested. I was able to conduct the research presented in this dissertation.

2.6.4 Accessing the *zona ribeirinha*

Another challenge during fieldwork was my ability to access the *zona ribeirinha*. I had originally planned on organizing speedboats; however, I realized this could affect the way resource users perceived me and it would be costly. First, the boats were owned by IBAMA and the sailors who drive them are contracted through CEPENE or ICMBio. Having read Nicolau's case (2006) in which *moradores* associated him with government and NGOs because he traveled on their speedboats, I realized this was a bad idea. The time I did accept a ride on a speedboat, that happened to be going to the *zona ribeirinha*, was when I was asked if I was police by a *marisqueira* as mentioned above. Therefore, instead of using speedboats, I searched for *pescadores* willing to take me to the *zona ribeirinha* because I wanted to be considered more an insider than outsider, never mind police, by *moradores* and I wanted resource users to trust me.

There were still challenges, however, and this required a half-day to full day of a *pescadores* time. There were three *pescadores* that provided me with transportation. One was a contracted mason, yet still considers himself to be a *pescador* because he fished for most of his life and still shrimps on some weekends. The second is a regular shrimper, who also provided transport to schoolchildren to one of the schools in the *zona ribeirinha*. This worked out well as I could easily embark in Caravelas Center to access Rio Cupido, where the school was located. The third is also a shrimper who was also

familiar with Rio Cupido. However, there were many other areas to sample in the *zona ribeirinha*. Most challenging is that these *pescadores* I traveled with were unwilling to lose a day of shrimping profit on weekends to escort me, for a humble fee, to the *zona ribeirinha*. One often cancelled because he was too exhausted from the week and wanted to relax and take the day off on Sunday. This was completely understandable and I had to find an alternative *pescador,* or turn my attention to other things on those days.

Other elements, that enabled or constrained access, were weather and tides. We sometimes would wait for poor weather, such as the southern wind, which makes for poor and dangerous shrimping conditions, yet not dangerous for accessing the *zona ribeirinha*. On the other hand, the tides often dictated whether or not one could access certain areas of the *zona ribeirinha*. Not all homes had small docks built and required walking through muddy mangroves at low tide to access them. One cannot access Rio Largo in a motorboat during low tide or the boat with bottom-out. My alternative was to arrive in Rio do Caribé to the east and trek across the landscape to sample in Rio do Largo. Nonetheless, it worked out in the end and I was able to sample the majority of the Cassurubá RESEX with their assistance and I am thoroughly grateful for their time.

CHAPTER III

ASSEMBLING RESEX: TERRITORIAL PRACTICES OF CASSURUBÁ RESEX ESTABLISHMENT

In this chapter, I investigate the discursive and territorial practices of establishment of the Cassurubá RESEX by asking *how* and *why* the RESEX was established, or by *whom* and through *what* means. These questions were answered adapting Li's (2007a) governance assemblage analytic, which demands examination of "elements": situated subject, their objectives, and things; and "generic practices" which bring the assemblage together. The framing is heavily drawn from Foucault's thesis of governmentality which involves getting people to act in a way they believe is in their own interest, and the practice of governing "men in their relations with things…wealth, resources, means of subsistence…territory…" (Foucault 1991, 93). The assemblage then, comes together through an array of power relations and shows how power is diffuse in its capillary forms (Dean 2013), and not necessarily practiced through a centralized point or totalizing plan of the State (Scott 1998).

The framework is discussed in detail in Chapter II, as are the data collection methods, which included semi-structured interviews with key informants such as government and NGO officials (n=20); semi-structured interviews with resource users (157); and participant observation in extractive reserve (RESEX) meetings and with resource users; and examination of documents and other texts following qualitative methods.

I demonstrate that government actors operationalize RESEX in a process not representative of resource users with little political power. Specifically, Cassurubá RESEX establishment was a politicized battle between politicians and environmentalists and resource users were mere pawns wagered in the territorial game. This is contrary to what establishment of RESEX is said to be, through federal institutions and reported by actors in power (government and NGO officials); therefore, operationalization of the Cassurubá RESEX contradicts the RESEX instrument.

This chapter supports the quasi-hypothesis that marine extractive reserves (MERs) comprise a conservation agenda that curtails access to resources negatively impacting livelihoods (Neumann 2004; West and Brockington 2006; Li 2007b; Larson and Soto 2008; Lele et al. 2010; Robbins 2012). I extend this thesis to account for power relations by concluding RESEX are a territorial instrument of control over people, resources, and relationships in a geographic space.

I present the research findings within the context of the RESEX instrument. The institutional context and prescription for RESEX creation will be presented segued by the operationalization of the Cassurubá RESEX based on the prescription, and guided by an adaptation of Li's (Li 2007a) "elements" of situated subjects and objectives. A discussion adapting Li's "generic practices" in support of the argument of this chapter will follow.

3.1 Results

3.1.1 Institutional context of RESEX

The Brazilian federal government is owner of RESEX with ultimate control over the reserve territory, or geographic space, beyond physical delineation. This includes access to RESEX resources, knowledge and politics. Several implications arise from this ownership status. First, any land within the RESEX territory that was privately owned, rented, or abandoned is now federal government domain. RESEX coastal land comprised of mangroves, beaches, or islands was already under federal ownership as are marine waters and oceanic islands.

Second, in regard to knowledge, research is heavily regulated and includes all research (social and biological) conducted within, or of, the RESEX territory, resources, or people. In order to conduct research of RESEX biological or human resources, a license is required through the Chico Mendes Institute for Biodiversity (Instituto Chico Mendes de Conservação da Biodiversidade, ICMBio) which is granted only to individuals who are associated with, or employed by, Brazilian governmental and educational institutions. Thus, access to knowledge is strictly and legally controlled and enforced by the Federal Government of Brazil, as my access was discussed in Chapter II.

Third, in regard to politics, RESEX are administered by ICMBio, and ICMBio and the Brazilian Institute of Environment and Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais, IBAMA) enforce institutions. The Ministry of Fishing and Aquaculture (Ministério da Pesca e Aquicultura, MPA) regulates fisheries

and a license (Registro Geral de Pesca, RGP) is required for commercial fishing in coastal and marine environments including RESEX.

Institution building and decision-making is ultimately under the authority and administration of ICMBio. Although RESEX are intended to be a co-managed, participatory conservation unit in which resource users elaborate new institutions for rules of use, ICMBio directs all aspects of decision-making processes and acts as mediator between Federal Government and RESEX processes in place. Each RESEX has an ICMBio manager who directs and manages RESEX processes including deliberative council meetings, decision-making of rules of use, and enforcement. An ICMBio official solicits the Federal Government, through the National System of Conservation Units (Sistema Nacional de Unidades de Conservação, SNUC), for RESEX establishment but with proof that "locals" have mobilized and have requested that a RESEX be created.

RESEX establishment is intended to be (according to Federal documents) and claimed to be (by various NGO and state actors) a participatory process that involves community stakeholders. In fact, a RESEX will only be considered for establishment per the demand and mobilization of "local" actors. Yet, the establishment of a RESEX is governed by the RESEX institution and relevant legal codes of SNUC and systematically executed by government officials. Specifically, Decreto 4340, 2002 of Brazil states that the act of creating a conservation unit shall indicate: "I - the name, management category, objectives, rules, the area, and body responsible [local ICMBIO official] for its administration; and II - the traditional beneficiary population in the case

of extractive reserves and sustainable development reserves" among other information in order for the proposed RESEX to be considered for decree. Therefore, the ICMBio official and other actors must conduct socio-economic assessments of the populations in the proposed RESEX area and determine what communities, or peoples fit into the category of "traditional populations" based on their livelihood practices and the legal definition of a RESEX.

According to Decreto 9.985, 2000 for SNUC of Brazil "The Extractive Reserve is an area used by traditional extractive populations whose livelihoods are based on extraction, subsistence farming and small scale animal husbandry, and aims to protect the basic livelihood and culture of these populations, and to secure the sustainable use of the natural resources in the unit." By these acts, resource users become "beneficiaries" and therefore have a new relationship to the state when a RESEX is decreed. With the stipulations of Decreto 4340, 2002 of Brazil satisfied, a RESEX is then decreed by the President of Brazil following submission of proof, by ICMBio, that there is local demand for RESEX creation. The proof is in the form of public consultations with local community members in which the RESEX is explained, a book of attendance and petition signed by locals, requesting a RESEX be established.

Once the RESEX is decreed, the next step is formation of the deliberative council for the RESEX. This council, by law (ICMBio 2010) is comprised of 50% +1 community organization representatives and the remaining seats are government, NGO, private sector actors and civil society. The council seats are to be voted upon by RESEX community members. The deliberative council is the governing body for RESEX and is

intended to provide a democratic and participatory means for decision-making of RESEX rules of use and development of a management plan. The management plan is the final institutional device created following RESEX establishment; however, they most often fail to be devised. In the case of the Cassurubá RESEX, the deliberative council was created in June 2013 with 27 members and the management plan is yet to be developed, as most RESEX in Brazil fail to have management plans (Santos and Schiavetti 2014).

Finally, RESEX resource users are expected to identify themselves as "beneficiaries" and register with The National Institute of Agrarian Reform (*Instituto* Nacional de Colonização e Reforma Agrária, INCRA) or ICMBio. INCRA's land registry is typically involved if a RESEX covers a terrestrial area; however, ICMBio is ultimately responsible for identifying and documenting RESEX "beneficiaries." Because of the previous challenges in defining RESEX "beneficiaries" a legal Normative Instruction was created as a guideline for determining the "profile" of RESEX family "beneficiaries" (ICMBio 2013a).

Once "beneficiaries" are identified and registered with the government system they will have access to the public benefits (*Políticas Públicas*) provided by various government entities. For example, the Bolsa Verde program provides R$300 every three months (R$100 month) to households that have a monthly per capita household income of R$70 or less, for reforestation. With the National Program of Rural Housing (Programa Nacional de Habitação Rural, PNHR), "beneficiaries" will pay only 1% interest, or R$286 per year, for four years to have a new home constructed. There are

also incentives for farmers. The Company for National Food Supply (Companhia Nacional de Abastecimento, CONAB) has a program (Produto do Sociabilidade, PGMG) in which agriculturalists that sell their product for less than the national minimum economic price for agricultural products, the government pays them the difference. However, the complicated bureaucratic process requires receipts (*notas fiscais*) and the difference is allocated to a checking account; therefore it is recommended that formalized associations (with CNPJ, which connotes a sort of legal personality for an organization or firm) access this benefit. This is not the complete list of benefits available to RESEX resource users and other poverty level citizens of Brazil. The point here is that the RESEX is devised as a bureaucratic systematic prescription for actors situated in its territorial space. I now discuss these actors and their objectives, laden with controversies, in establishment of the Cassurubá RESEX.

3.1.2 MERs in practice: Establishment of the Cassurubá RESEX

3.1.2.1 RESEX versus Coopex

The main reason for creation of the Cassurubá RESEX was to stop a proposed shrimp aquaculture project in 2006, although other issues, including outsiders extracting in the area, the threat of potential petroleum extraction, and the presence of Fibria mobilized stakeholders. The processes of Cassurubá RESEX establishment constituted a political battle over resources and territory by actors in power, rather than resource users with hardly any political influence. One key actor, employed by the municipality of Caravelas stated, “You could not have the shrimp farm and the RESEX. It had to be one

or the other" (KECACE17, 8/11/2013). In the words of one *pescador* "It was a government set up. The only option was to create the RESEX. They could have stopped both the RESEX and Coopex but they did not. They made the RESEX the only option" (PEALPO02, 9/25/2013).

The original idea to create a RESEX emerged in 2002, driven by few individuals; the same year a proposed shrimp aquaculture project for the area was publicized (Nicolau 2006). An IBAMA official proposed the RESEX idea to resource users under the pretext that it would prevent outsiders from extracting mangrove crab in the area, which had been a problem. Both environmentalists (within government and NGOs) and resource users perceived a large decline in the crab populations and attributed the decline to the over exploitation by outsiders. Another individual, and former fisherman, who became employed by an NGO wanted to improve fisheries as catch had declined. He had seen the no-take fishing zone approach in the Corumbau RESEX to the north and supported the idea for the Cassurubá area. He and the IBAMA official began to propose the RESEX idea to other locals including resource users. Knowing that a collective of resource users must petition for a RESEX establishment, the IBAMA official suggested that resource users form an association to make a formal request (Nicolau 2006). Taking this advice, in January 2005, the Association of Shell-fishers of Ponta de Areia and Caravelas (Associação de Marisqueiros de Ponta de Areia e Caravelas, AMPAC) was formed, a formal request was made to create a RESEX and within months the establishment process began. In 2007, the Association of Fishermen of Caravelas (Associação de Pescadores de Caravelas, APESCA) was also formed by an elder

fisherman who allied the cause. The formal associations of resource users created more leverage for RESEX establishment. Nonetheless, these and other environmental actors, because of the potential threat of the shrimp aquaculture project, hastened the mobilization for the RESEX, because licensing for Coopex was to be approved for licensing in 2006 by the Environmental Resource Center of the State of Bahia (Centro de Recursos Ambientais, CRA).

The shrimp aquaculture project of Coopex (Cooperative of Shrimp Farmers of Southern Bahia), endorsed by Bahia Pesca (linked to the Secretaria de Agricultura, Irrigação e Reforma Agrária da Bahia, Seagri) and politicians, was to be the largest in Brazil at 1,500 hectares and was to create over 1,000 jobs. Nicolau (2006) describes the four-year Coopex versus RESEX battle as one between environmentalists and politicians. State and Municipal politicians had a financial stake (R$60 million investment) and vested interest in the project with family members of Bahia Pesca. More specifically, a former Senator of Bahia, João Batista Motta, and five of his family members were members of Coopex.

Environmentalists including Conservation International (CI), Ecomar, The Humpback Whale Institute (Instituto Baleia Jubarte, IBJ), Arte Manha, and federal agencies (ICMBio and IBAMA) opposed the Coopex project because it would potentially destroy mangroves, contaminate groundwater and displace residents. Each side therefore rallied resource users and other locals to their side in the four-year battle.

IBAMA, ICMBio and NGOs took action, backed by AMPAC and APESCA, by holding public consultations in various resource user communities of the proposed

RESEX area. They held two meetings (January and February of 2006) and gained the support of many resource users residing within the proposed terrestrial area of the RESEX, particularly those who would be physically displaced by the Coopex project. However, several communities of resource users and many other locals of the peri-urban center of Caravelas were opposed to the RESEX idea. According to key informants, they leaned toward the Coopex side which promised to create jobs, and because rumors were spread by politicians and paid henchmen that if the RESEX was created then resource users would lose their land and rights.

More insidious were the repeated attempted prosecutions by politicians to prevent establishment of the Cassurubá RESEX. In May 2006, a lawsuit was filed against IBAMA by the city councilors of Caravelas in an attempt to suspend RESEX establishment processes. In January 2007, a Federal Court ruled that a third public consultation be conducted but under the provision that technical consultants be assigned to oversee RESEX legal and regulatory provisions for the consultation process. This is because the first public consultations were annulled because of technical issues pointed out by the plaintiffs. These include arguments that the consultations did not have maximum representation of resource users, were not properly publicized and in inadequate locations (Lourenço no date).

The litigation caused delays, however, the pro-RESEX activists succeeded in lobbying the federal government for the creation of the Abrolhos Buffer Zone (Zona de Amortecimento, ZA). The buffer zone was published in the Official Gazette on May 18 2006, one day before Coopex was granted its location licensing by the State Council of

the Environment (Conselho Estadual de Meio Ambiente da Bahia, CEPRAM). The existence of the buffer zone now meant that the Coopex project, and licensing, had to be approved by IBAMA. While Coopex supporters tried to overturn IBAMA's approval of licensing, CEPENE, CI and others provided evidence of flaws in the environmental impact assessment (EIA) report for the Coopex project. Further, CI, among other NGOs, lobbied the Ministry of Environment to have the license suspended. The licensing was permanently suspended in August 2007 because of irregularities (IPS 2007). It remains unclear, however, how the licensing process was approved in the first place since according to the National Environmental Council (CONAMA), mangroves are designated as "areas of permanent preservation" (Jablonski and Filet 2008).

The third public consultation was also delayed by opponents who requested that a public meeting be held to clarify what a RESEX was. Further, the councilors of Caravelas, and now mayors of Caravelas and Nova Viçosa backed by the Governor of Bahia, Paulo Souto, had taken legal action in May 2007 and requested that the third public consultation be suspended. However, the Federal Court denied the request and the consultation took place that month.

In December 2007, the Federal Governmental announced the new Cassurubá RESEX, among other protected areas decreed. However the Cassurubá RESEX was not published in the official gazette until June 2009. Notwithstanding shrimp aquaculture was not possible now that a RESEX had been decreed. But, the Coopex versus RESEX conflict was not over.

The mayors of Caravelas and Nova Viçosa filed a third lawsuit against the Federal Government and ICMBio. The injunction request filed on November 3, 2010 reported that the plaintiffs argued that creation of the Cassurubá RESEX was riddled with irregularities that compromised its validity, and the RESEX harms the municipalities in economic and social terms. The plaintiffs specifically purported that there was "illegal formulation of the public consultations; breach of internal regulations of the Ministry of Environment (MMA); illegality in the request for creation of the RESEX; absence of traditional community in the area; potential for harm to numerous municipalities; lack of budgetary resources to expropriations; and undue expansion of the area of extractive reserve without prior consultation of interested parties" (Mendes 2010). The Minister dismissed the injunction because of lack of proof to support the claims.

3.1.2.2 Outsiders, petroleum and Fibria

As mentioned earlier, an underlying factor for creation of the Cassurubá RESEX was, first, to prevent outsiders from fishing and extracting shellfish in the area. Resource users of the Cassurubá area backed the conflict with outsiders. Apparently, *pescadores* (fishermen) and *marisqueiros* (shell-fishers) from northern areas of Bahia, such as Canavieiras and Ilhéus, were exploiting the area as their seafood stocks in their areas had been depleted. *Marisqueiros*, both men and women, of Cassurubá had regularly complained that these "outsiders" were camping in the mangroves and taking truckloads of mangrove crab (*carangejo*) and the crabs were "disappearing." ICMBio and CEPENE

capitalized on this outsider issue by promoting the RESEX as a means to prevent outsiders from exploiting Cassurubá resources. However, they failed to explain to resource users during mobilization to create the RESEX that these "outsiders" hold the federal RGP and are licensed to fish and extract anywhere in Brazil. The only way to remove them would be by physical means by local resource users. In 2013, *marisqueiros* from Canavieiras were still extracting mangrove crab from the Cassurubá RESEX.

Many *pescadores* also complained of outsiders fishing in the area, but the conflict was more localized. Shrimp *pescadores* of Caravelas and Nova Viçosa did not want Alcobaça, the neighboring municipality, to fish in their waters. Alcobaça *pescadores* were placing drum nets that obstructed the shrimping boats of the other two municipalities. Ironically, Alcobaça was originally excluded from the Cassurubá RESEX, but later included because *pescadores* fought for their right to maintain access to fishing grounds, and gained a seat on the deliberative council.

Second, the potential of petroleum extraction was another major driver for the creation of the Cassurubá RESEX. Petroleum has been discovered within the RESEX, and in the Abrolhos Bank. Environmentalists were strongly opposed to the possibility of extraction because of the large-scale damage it could cause in highly valued ecosystems, including the Abrolhos reef, and coastal mangroves and estuaries. Furthermore, the marine waters are birthing grounds for humpback whales that migrate annually between June and November. The establishment of the ZA, mentioned above, was also part of the efforts of NGOs to control the potential of petroleum extraction. Moreover, they made attempts in 2013 to expand the area of the Abrolhos National Marine Park to prevent

petroleum extraction altogether. However, they were unsuccessful since resource users would not be coerced.

In the words of one *pescador*: "They want to expand the Abrolhos Park because Petrobras wants to drill. They do not monitor in this park, how can they monitor in a bigger park? They wanted Petrobras to pay for the expansion. We spoke up and we refused to sign the document. We ripped up the document. This was in the beginning of this year. Petrobras would pay ICMBio and IBAMA for drilling in the Park. Petrobras did not drill yet but they will come" (PECABC11, 11/18/2013). Another *pescador* stated, "NGOs come here and want to create these [protected] areas. Even the Abrolhos was going to be expanded, but the people here say 'how can you tell us we can't fish where we have fished all our lives'. The people here do not let this happen" (KACACA13, 06/28/2013).

Officials of SNUC in Brasilia would not expand the Abrolhos National Marine Park without proof of resource user support and consent. But this has not stopped the NGO agenda and they are working hard to make the expansion happen. A CI Marine Biologist has a project, complete with International Campaign funded by Pew Environmental Trust, to expand the Abrolhos MPA Network to approximately 8.5 million hectares of no-take and multi-use zones. This includes an increase of no-take areas in the Abrolhos National Marine Park from 88,250 hectares to 1 million hectares (PEW 2012).

Third, Fibria, and its eucalyptus activity, had heavily altered the coastal and marine area for the proposed RESEX. If a RESEX were established then environmental

monitoring, conducted by environmental specialists of Fibria and licensed by IBAMA, would be approved by ICMBio with administrative authority of the RESEX. Environmentalists and *pescadores* perceived the dredging activity as a cause of major damage to the area; shrimping grounds were destroyed, and sediment was being displaced creating unnatural sandbars and becoming trapped in shrimp trawlers.

Furthermore, Fibria's environmental mitigation funds would become available to government (CEPENE, ICMBio), NGO (Ecomar, IBJ), and fishermen's associations (APESCA, AMPAC). Fibria, therefore, became a major partner of the RESEX and allied the cause replete with agreements. Fibria was a major sponsor of CEPENE and IBJ through stipulated compensation for continued dredging activities. Fibria also executed a program of support for fishing communities through APESCA and environmental education and communication programs through ICMBio (Galdino 2013).

3.1.2.3 Subaltern perspectives and state of knowledge

The mobilization of various actors to prevent shrimp aquaculture, outsiders from collecting resources, petroleum extraction and Fibria's impact all contributed to mobilization to establish the Cassurubá RESEX. However, "environmentalists" wanted the RESEX more than resource users. Although several resource users claimed that they supported the creation of the RESEX because of outsiders, most resource users and other locals were opposed to the RESEX since the beginning. Resource users claimed that the public consultations were phony and that they were fooled into signing the petition to create the RESEX. One *pescador* stated, "People that had nothing to do with anything

were signing the book [of attendance]" (PECACE11, 07/23/2014). Another declared, "There was a party…they had it to motivate people to sign the book [of attendance]. They served lunch snacks and juice. Anyone there could sign the book, even people who it did not affect" (PECACE27, 08/03/2013). Another claimed, "They had a party, a band, and called all the *ribeirinhos* to sign the book of attendance. I was there and I saw people drinking *cacha*ça. It was 15 days of partying. And then the RESEX exploded" (PECAPA01, 07/10/2013).

The petition was also controversial. Several respondents indicated that resource user names were stolen for the petition and individuals who had nothing to do with the RESEX signed the petition. Resource users and locals witnessed environmental actors obtaining signatures from people in restaurants in Caravelas Center. For example, in the words of one *pescador*, "We never signed anything, only if they took our names and signed our names, or put our names there" (PECACE25 07/29/2013). Another furiously stated, "They came here and took our names. I never signed anything. I do not know how to sign. This river may have 1000 people and they said they got 1,500 signatures. They came here and took our names, and used our names to sign! My name could be there and I do not know if it is!" (MOCACA05, 09/16/2014). Many resource users complained, "there was a lot of signing without knowing" (PECABC05, 10/14/2013). Only 10% of resource users interviewed (122) claimed they signed the petition, and most resources did not understand what a RESEX was.

Indeed, interviews with resource users revealed that they were not fully aware of the location, extent or objectives of the Cassurubá RESEX as determined by key actors,

legal codes and maps. Some resource users perceived the RESEX as two separate things: one RESEX involving the marine area, which they thought was yet to happen; the second involving the terrestrial area (*zona ribeirinha*) where the RESEX has happened and where people could no longer "work." As explained in Chapter II, the RESEX polygon entails terrestrial and marine spaces. One *marisqueira* exhibits this confusion: "The Cassurubá reserve, they talked a lot about it…because they were going to make it. Now I do not know if it is functioning. The reserve was [created] because they were scared of the shrimp [farm] but I do not know what's happening now. But it is over there at Cassurubá" (MACACE2011, 07/07/2011). From Caravelas Center, she pointed towards the terrestrial area of the RESEX across the Caravelas River. Another *marisqueira* declared, "I do not know anything about the RESEX. I do not go there" (MACACE05, 08/02/2013). A *pescador* stated, "For now, from what I know, it has not yet become a reserve in the sea. The places where the majority of people still fish, they are still fishing there because when it really happens there will be monitoring and oversight and everything. When it is really affirmed" (PECACE2211, 07/11/2011). In short, this statement of a *marisqueira* exemplifies resource user state of knowledge of the RESEX: "What is a RESEX? I do not know. I do not know any rules. All I know is that you cannot fish in the [Abrolhos] Park" (MACAPA02, 07/13/2013).

The majority of resource users were also unaware of the spatial extent of the RESEX, other than stating it extended between the municipalities of Caravelas and Nova Viçosa. Few claimed to have seen a map of the RESEX despite its creation being

publicized with map by ICMBio and other NGO actors as a participatory process, per requirement of the RESEX institutional prescription.

Even key actors stated that resource users were unaware of what a RESEX was or knew that it was established. The quote below espouses the state of knowledge, as perceived by an NGO actor:

> "There are many people who do not know the RESEX here exists; they do not believe that it is there. We just did some work on the process of forming the [deliberative] council and we went to the communities to see what they knew and many people did not know there was a RESEX and they did not know the limits of the RESEX. This is because when this RESEX was made it was done so in a very peculiar way. Even local people do not know what the RESEX is for and they can't learn what it is from one day to the next. This is going to take long" (KACACE11, 7/12/2011).

3.1.2.4 "Expert" perspectives and state of knowledge

Government and NGO officials perceived resource users as deficient in many areas of their livelihoods. According to a government official, resource users were over-fishing, using inappropriate gear, clear-cutting forest (considered technically illegal in a RESEX) and raising cattle (considered technically a non-traditional practice in a RESEX) in the terrestrial area of Cassurubá (KACACE07, 07/04/2011). Socioeconomic surveys (NAPMA 2005; Curado 2009) conducted in the Cassurubá area showed that most of the resource users of the Cassurubá RESEX lacked electricity, clean drinking

water, and education. Most residents of the terrestrial sector of the RESEX are illiterate; ironically, they were even stated to lack culture, yet were described as "traditional" (NAPMA 2005, 28).

According to the report (NAPMA 2005) no cultural activity was observed to be representative of the entire population of the area of Cassurubá area, even while there are several generations present, maintaining the same livelihood activities of farming and extraction of mangrove and marine resources. The report went on to indicate that the Cassurubá "island" area lacked cultural heritage and that ethnographic research should be conducted to retrieve the local knowledge. The hegemonic ideology was diffuse as even a local educator at a council meeting stated, "the *moradores* of Cassurubá were ignorant and had no desire to be educated." A government official stated in an interview that resource users were uneducated and he brazenly declared, "I cannot deal with their ignorance. I have no tolerance for the class of *pescadores*!" (KACACE15, 08/13/2013).

Resource users also lacked organization and needed to be empowered, as expressed by a government official:

> "The fundamental need of a RESEX is their self-organization. If they do not have self-organization they won't achieve anything. This is what makes it interesting because it is not paternalistic or assisted. It is not this. They do not want to be treated with pity; they need to be given voice and power. They need to participate and be protagonists. It is not a political maneuver. This is our idea and we hope that everything goes right with this idea. The area here is totally consistent with the idea to be an RESEX. The conditions are appropriate; they live life as

> extractivists but in conditions of poverty and they were never heard. This is true… we hope that with the reserve they will be heard; that they have a voice and power, this is what we are aiming for" (KACACE07, 7/4/2011).

As will be discussed later, these so called deficiencies created a perfect recipe for intervention into resource user livelihoods. Moreover, these claims of deficiencies were made despite the fact that resource users in general do not make these claims of themselves. Moreover, they are content with their livelihoods. Previous socioeconomic reports (NAPMA 2005; Curado 2009) did not attend to resource user aspirations; they only prescribed deficiencies.

Resource users of the Cassurubá RESEX enjoy their lifestyles, which are in fact historically and culturally embedded, as will be discussed in Chapter V, in more detail. A tiny minority, 2.4%, of resource users interviewed stated that fishing was their only option and they would prefer another means of income. The remainder literally declared they were "happy." For example, *moradores* stated, "I am very happy. I do not imagine anything different" (MOCALA03, 12/04/2013) and "I am very content raising cattle and fishing. I like it here. It is my place" (MOCAMA02, 08/21/2013). *Pescadores* stated, "I am happy with certainty and because of this I fight. My work pays for my son's education. This is why we have to fight for our rights, or things could get worse" (PEALPO03, 12/13/2013) and "I like this life, this work. Since I was a child I lived like this. I would never be able to live in a big city. I have a boat to fish on and I do not have anyone ordering me around" (PECABC03, 10/10/2013). *Marisqueiras* stated, "I am happy! I would rather be in the river fishing than anything else. I do not have to work

certain hours or be in a specific place" (MACACE01, 07/30/2013) and "This is our life. I do not imagine myself doing anything else. My parents, brothers, children, all fish. Those who were raised with fishing, there is no other way. This is our life" (MANVPO05, 12/05/2013).

3.1.3 Discrepancies in RESEX institutions

Following establishment of the Cassurubá RESEX many social and political challenges, conflicts and contradictions ensued. First, deliberative council meetings have low attendance. Resource user participation in meetings had been poor during four public deliberative council meetings held in 2013. The maximum attendees reached 50, hardly representing the over 2,000 resource users of the RESEX. As for the resource users interviewed, only 9% participated in meetings regularly. The 91% that do not attend stated they could not lose a day of work or were too busy, were not interested, or were not notified of the meetings. Several *pescadores* complained that ICMBio did not have a car on the street to announce the meetings. Nonetheless, Cassurubá RESEX resource users are expected to miss a full workday and provide their own transportation. As a reminder, they are said to live in poverty, particularly Cassurubá residents, suggesting that it is virtually impossible for most to attend the meetings. The Cassurubá terrestrial area extends from Caravelas in the north to Nova Viçosa in the south, encompassing approximately 20 km. Residents of the Cassurubá "islands" must arrive by boat. From Nova Viçosa to Caravelas, it is 125 km by car (~1 hour and 40 minutes), or anywhere ranging from 1 hour and 30 minutes to 4 hours by boat, depending upon the

type of motor. The meetings are held in Caravelas because ICMBio officials, who oversee the RESEX, and key NGOs are based there. Nevertheless, it is physically difficult for resource users to attend meetings.

Second, in 2013 the polygon of the Cassurubá RESEX was re-delineated because the Municipality of Nova Viçosa and the Ministry of the Environment brought the case to Brasilia and lobbied to have the RESEX boundaries changed. This is because the original polygon covered parcels of urban land, including privately owned, that were planned for development. A government official of Nova Viçosa stated that when the RESEX was originally delineated by ICMBio "they did not come and check if we had an urban plan. This is why the mayor did not want the RESEX. You have to leave an area for the city to grow, an urban area to grow, and people have rights to sell their land. There are people here that own land in urban areas. We had to fight. We went to Brasilia this year to fight for this" (KANVCE18. 12/11/2013). The political conflict essentially did not end with the gazette of the Cassurubá RESEX in 2009.

Third, many resource users were contesting the RESEX, even in 2013. One *morador* in particular was seeking attorneys to bring suit against the RESEX because he believed his land and rights had been appropriated by the RESEX. More specifically, he is carpenter and selective logger on land that was his grandfather's. His forested land in Cassurubá of the *zona ribeirinha* is intact and he selectively logged in times of need. In 2011, he had extracted $6,000 worth of timber for surgery and ICMBio apprehended the timber before it could be sold. The RESEX manager told him that it was illegal to fell trees. This *morador* was not against the RESEX or conservation, he simply stated that

"things were not being done right" (KACACE12, 07/15/2011). He could not have been more correct. According to the RESEX instrument, rules of use are to be elaborated by resource users and commercial extraction is permitted if approved by the deliberative council and incorporated into the management plan.

Fourth, ICMBio in 2013, four years after the Cassurubá RESEX was decreed, was still trying to define and document RESEX "beneficiaries" and resource users were trying to understand what a "beneficiary" was. During the *Políticas Públicas* seminar in 2013, resource users were repeatedly told they had to identify themselves, organize themselves, and register in order to access government benefits. Argument and discussion ensued episodically for two days regarding who was a RESEX "beneficiary" and what they must do. Resource users were contesting the notion of "beneficiary." The "beneficiary" issue is discussed in greater detail in Chapter V. Nevertheless, the main reason resource users had not registered with ICMBio was fear. They did not understand what a RESEX was and they were afraid to lose their rights and access to resources. Both resource users and key actors emphasized this issue during deliberative council meetings in 2013, and during interviews. One *marisqueira* asked, "I do not understand anything about it. They are registering us. Why are they doing this?!" (MACAPO01, 08/23/2013). In December 2013, a prescription for defining RESEX "beneficiaries" was created (ICMBio 2013a), over 20 years following the creation of the first RESEX in the Amazon. In July 2014, five years after Cassurubá was created, ICMBIO began conducting another registry of "beneficiaries." An announcement posted on the Cassurubá RESEX Facebook asks households to open their doors and respond to

ICMBio officials that arrive to register them. Ironically, the "illiterate" residents of the *zona ribeirinha* do not have electricity, never mind Internet access.

Fifth, establishment of the Cassurubá RESEX has reinforced conflict between *pescadores*. In April 2013 authorities of the Cassurubá RESEX established a fishery agreement (*Acordo de Pesca*) (ICMBIO 2013b) with the deliberative council in order to promote sustainable fisheries of the area. Only 11 active *pescadores* where present when the agreement was established (Nobre and Schiavetti 2013). The laws include, but are not limited to, the following: Motorized boats must fish 500 meters from the shore along the Ponta do Catoeiro to Barra de Nova Viçosa, and are not allowed to fish inside the rivers; each drum fishing boat is limited to 30 *tainheira* nets and the mesh must be at least 35 mm; each bonito fishing boat is limited to 40 bonito nets and the mesh must be at least 45mm; placement of drum nets must be parallel to the shore (rather than perpendicular as it obstructs shrimping boats); and it is illegal to fish with drum during the shrimping closures in April and November. Ironically, the very *pescadores* who participated in the agreement contested this rule only three months later and wanted it rescinded but their request was denied (Nobre and Schiavetti 2013). Moreover, the deliberative council has created a forum for conflict between *pescadores*; those of Caravelas and Nova Viçosa were still trying to exclude Alcobaça from the RESEX in 2013 as documented by Nobre and Schiavetti (2013), and witnessed in council meetings. Moreover, the 500-meter law was said, by an ICMBio official, to be created to prevent *pescadores* from Caravelas and Alcobaça from fishing along the shore near Nova Viçosa to secure the area for those who fish in canoes and rowboats. However, resource users

did not report this in 2013 (n=122), rather, there existed conflict between *pescadores* of Caravelas and Alcobaça.

Alcobaça, the municipality to the north was originally excluded from the Cassurubá RESEX despite having fishing grounds within the RESEX for decades. They were not even involved in the petition signing during Cassurubá mobilization. The vice president of the Fishermen's Colony (*Colonia de Pesca*) of Alcobaça stated, "we fought for our rights and seat on the council" (PEALPO03, 12/13/2013). Approximately thirty *pescadores* of Alcobaça shrimp and extract drum along the shore in the RESEX area and many *pescadores* of Caravelas had complained of their method of placing drum nets which obstruct shrimping boats. This was resolved in the new fishery agreement. However, during deliberative council meetings in 2013, *pescadores* of Caravelas were still attempting to exclude Alcobaça from the RESEX.

On the other hand, some *pescadores* of Alcobaça and Nova Viçosa perceived things differently. *Pescadores* of Alcobaça stated; "This is why we fight, to be partners, Nova Viçosa has more drum and [Alcobaça] gives more shrimp. Here we only get drum in August. So both communities lose if we do not unite. Our vision is to unite" (PEALPO03, 12/13/2013); and "We go south when there is less shrimp here [in Alcobaça], and when there is southern wind, Nova Viçosa comes north. Basically, the northern winds push the shrimp south so we have to go south. The southern wind is not bad here so the people from the south can fish here and to the north. There is no necessity for conflict and nature is for all of us" (KAALPO19, 12/13/2013). A *pescador* of Nova Viçosa declared, "We do not need something that separates us. The RESEX is

separating cities of *pescadores* when we should be together, fishing together, united. They are making it like a war between us. We need their area to fish and they need ours. I say this because in winter we fish in Alcobaça and in summer they fish here. The majority of us *pescadores* here think like this. Those who do not think this way do not want Alcobaça here because they do not fish in Alcobaça in winter. I fish in many places, Corumbau, Alcobaça, Nova Viçosa, Mucuri. No one tells us to leave, we get along" (PENVPO19, 12/10/2013).

In short, socio-political processes following establishment of the Cassurubá RESEX have been complex and messy, as to be expected in a territorial battle over resource access and use. I now turn to a discussion adapting Li's (2007a) "six generic practices" to show how the Cassurubá RESEX is a "practice of assemblage;" "the on-going labour of bringing disparate elements together and forging connections between them" (Li 2007a, 263) and a means to govern people, resources, and their relations, which is no easy endeavor in a territorial arena.

3.2 Discussion

The operationalization of the RESEX instrument in the case of Cassurubá is arguably the most controversial of those publicized of RESEX in coastal Brazil. The contentious conflict between politicians and environmentalists obscured the fact that the majority of resource users were but mere pawns wagered in a bigger territorial game, bought in with the idea that they could exclude outsiders from their RESEX, and access economic benefits that would improve their livelihoods. I now turn to Li's (2007a) six

"generic practices" to support my argument that establishment of RESEX are a "practice of assemblage" and means to a control people, resources and relationships in a geographic space.

3.2.1 Forging alignments

Partnerships had to be formed by various actors, and their objectives linked, in order for the Cassurubá RESEX to be established. This included partnerships between government (ICMBio, IBAMA, CEPENE) NGOs (CI, IBJ, Ecomar, SOS Abrolhos) fishermen's associations (AMPAC, APESCA) and Fibria. Therefore, with the environmental threats of the proposed shrimp aquaculture, outsider exploitation of resources, potential petroleum extraction, and dredging damages, partnerships among and between these actors were formed. However, as explained earlier, a legal prescription must be followed for RESEX establishment, which involves an evaluation of biodiversity and "local traditional populations" and proof of public consultation with resource user communities. "Local" mobilization is required in order for a proposed RESEX to be considered for decree by SNUC. Therefore, it was imperative that resources "buy into" the RESEX idea and this was achieved by promising benefits such as secured access to resources, the right to exclude outsiders, and potential economic incentives of the *Políticas Públicas* described earlier. However, as Li states, (2007a, 268) "promised benefits for [resource users] are intimately linked with attempts to govern their conduct-attempts that the targets of government often resist," as will be discussed shortly.

The main group of resource users that backed the RESEX cause was *pescadores* mainly representative of AMPAC and APESCA. There had been conflict between them and outsiders, including Alcobaça, to the point of threats with weapons, and even violence, several *pescadores* stated. There was also the issue of outsiders depleting populations of mangrove crabs. These resource users approached IBAMA and NGO officials with concerns of outsiders and these officials in turn mobilized other resource users of the area to request a RESEX be created. With the threat of the Coopex project resource users then needed to be reminded of their interest in protecting their resources and territory. This sparked the movement for creation of the Cassurubá RESEX since the main objective of *pescadores* was to ban outsiders from extracting in the area.

By contrast, the main objectives of IBAMA/ICMBio and NGOs were biodiversity conservation reinforced by the threats of shrimp aquaculture and petroleum extraction. Most significant was the plan, unknown at the time to resource users, to create the Abrolhos seascape and increase the area of the Abrolhos National Park by 10,000 square kilometers and create the 85,000 square kilometers Abrolhos MPA network area. An NGO key actor who was involved in creating the Canavieiras, Corumbau and Cassurubá MERs was awarded the Pew Environmental Fellowship in 2012 including US$150,000 for his efforts. The expansion efforts also resulted from international conservation agreements as "Brazil agreed to protect at least 10 percent of its waters by 2020" (PCT 2012). In effect, the MERs that were established along the coast of the Abrolhos Bank were part of a grander plan of conservation actors including CI and ICMBio that had access to politics and financial donors. As explained earlier, the

plan for Abrolhos expansion is still in effect but with much resistance by *pescadores* of the Cassurubá RESEX. Moreover, only a fraction of resource users supported the establishment of the RESEX. However, as Li states, "resource users have a natural interest in sustainable management, but they need to be educated and reminded of this interest. Their agreement and compliance must be invoked, and their organizations made strong and participatory. There is, in short, work to be done" (2007a, 270).

3.2.2 Rendering technical

Establishment of the Cassurubá RESEX required a great deal of work by professionals. Resource users needed to fully participate in RESEX processes as a community-based conservation mechanism but first their deficiencies needed to be addressed. Therefore, problems needed defining and interventions planned by professionals in hopes of producing desired results. In this respect, "communities must be rendered technical, their internal dynamics, customs and values examined, their interactions with land and forest assessed, their deficiencies identified and interventions devised to secure optimal arrangements" (Li 2007a, 270). The "problems" came to be defined as poor education and poverty of resource users of the Cassurubá RESEX who have substandard living conditions and unsustainable livelihood activities, particularly those of the *zona ribeirinha*.

As explained in the results, according to actors in power, resource users were over-fishing, using inappropriate gear, clear-cutting forest, and raising cattle. *Moradores* of the *zona ribeirinha* lacked electricity, clean drinking water, basic sanitation, and

education. Resource users of Cassurubá lacked culture according to a socioeconomic report (NAPMA 2005). Many government and NGO officials stated resource users were disorganized and need to be empowered. All of these deficiencies create the perfect recipe for intervention with RESEX resource users; they were uneducated, needed to be taught how to sustainably extract resources, needed to organize themselves, and their livelihoods needed improvement.

First, while it is true, in general, that the income level of many Cassurubá RESEX resources users is at the lower end of the economic spectrum, and housing conditions and educational infrastructure should be better, these prescribed deficiencies beg problematization. Ferguson (1994, 255) described improvement as a "point of entry for an intervention of a very different character." In other words, one in which resource users will be told what is best for them and livelihoods governed by RESEX authorities. Enumerators documented resource user material assets, or lack thereof, and they were then prescribed deficiencies by government officials deeming them "beneficiaries" whose livelihoods needed improvement. This is despite the fact that the majority of resource users were 'happy" and wanted to maintain their livelihood activities, a desire that previous socioeconomic surveys (NAPMA 2005; Curado 2009) failed to represent.

Second, the Cassurubá RESEX area is constituted historically by people that have resided there for several generations (Ralile 2006). The region was settled in the mid sixteenth century by Portuguese and others and fishing and farming have been their main economic and subsistence activities ever since. There is a deeply embedded custom of Saturday fair in which agricultural producers, *pescadores* and *marisqueiras* from the

Cassurubá terrestrial area transport their products to the main land of Caravelas for sales and barter. Historically, the livelihood systems of *pescadores* and agricultural producers intertwine as "everyone knows that pescadores are tired of eating fish" and agricultural producers depend on seafood as a protein source. This tradition, and the history of the area, was erased in the aforementioned socioeconomic reports and resource users of the Cassurubá RESEX were portrayed to lack a representative culture.

Third, Cassurubá RESEX "beneficiaries" were lumped into a single unit regardless of "differences in people and their interests" (Ferguson 1994; Li 2007b) and diverse incomes or livelihood assets. For example, only half of the resource users of the Cassurubá RESEX own motorboats, and those who own motorboats have significantly higher incomes than those that own non-motor boats (Curado 2009). Motorboat owners, whose standard of living is considered better than those residing in the terrestrial area of Cassurubá, reside in the urban centers of Caravelas and Nova Viçosa. This is discussed in greater detail in Chapter V.

Notwithstanding, and fourth, government officials are also drawing a fine line between "traditional" and "non-traditional" livelihood practices in the RESEX. Extracting mangrove crab with anything other than by hand or a hook is not considered "traditional" and therefore illegal. Raising cattle in RESEX also shows problems categorizing resource users as "traditional" or "non-traditional." As in other cases (Willems-Braun 1997; Li's 2007b), concepts of "traditional" are externally ascribed by RESEX institutions and authorities, which serve to limit livelihood practices. Therefore, governing the Cassurubá RESEX means that resource users who have been fishing,

farming, and raising livestock for generations need to be educated and improved, and their relationship with the environment reshaped to reflect their needs as "beneficiaries." However, the problem of defining "beneficiaries" points to technical difficulties and deep fracture in the assemblage, a topic addressed in detail in Chapter V. I now turn to discussion of knowledge.

3.2.3 Authorizing knowledge

The RESEX instrument is operationalized by government and NGO actors through a process that Rose (1999, 175) described as one in which traditional populations are "investigated, mapped, classified, documented" and made legible to the state. "Community" is therefore deployed by authorities, prescribed by the RESEX instrument as a blueprint within the arena of Cassurubá. However, RESEX processes are hardly questioned because of their charismatic origin emerging from the rubber tapper movement, made politically sacred with the assassination of Chico Mendes in 1988. However, it was a rare case, or "rare conjuncture" as Keck (1995, 276) states: "Few indigenous and rubber tapper populations in the Amazon are so well organized, and such a powerful form of international leverage is rarely present."

On the surface, it appears that community-based conservation initiatives are driven by few examples of what is considered successful by experts such as the work of Elinor Ostrom drawing upon common property theory. As Li (2007a, 273) states, "the research base to support community management programmes is sketchy." Critical scholars of "community" have argued; they begin with positive claims and end with

(un)intended consequences or negative outcomes (Creed 2006; Sumner and Tribe 2008). Further, romantic or apolitical notions of community "squeeze out" conflict or resistance (Defilippis, Fisher, and Shragge 2006). Also, (mis)application of Ostrom's common property framework by scholars tends to result in technical difficulties or behavioral issues because, inevitably, ideal "community" behavior is difficult to mold. Rather than explain why communities are not coercible, apolitical claims are made about collective action based on preconceived notions of what community should be and point toward people problems.

For example, in regard to MERs, Da Silva (2004) applied Ostrom's framework and found lack of participation, collective action, and organization of resource users. As mentioned earlier, the Corumbau MER experienced issues with participation, organization and conflict as well. It seems, at least superficially, that MERs in coastal Bahia are experiencing cooperation or people problems; they are not properly behaving as "communities" following MER implementation. It appears that the Cassurubá RESEX has the same technical and people problems as does other MERs in the State of Bahia. Government and NGO officials argued that the most problematic issue impeding progress of the Cassurubá RESEX was the lack of community, participation and organization of resource users. They were not behaving as good subjects. They needed to be autotomized, organized, made responsible, and democratized in order for the RESEX to be a success. If resource users want collective ownership of RESEX resources, access to politics (participatory decision-making through the deliberative council) and government incentives, then resource users must behave in particular ways.

Government and NGO actors stated there was the lack of participation and organization of resource users. However, these actors in place have been working hard to coerce resource users into organizing themselves. An NGO report states, "if a community desires to be part of a protected area, in particular an Extractive Reserve, *they must organize themselves to do so*" (STA 2010, emphasis added). In 2011 and 2013, many key actors repeatedly expressed that the resource users were not organized enough and this is why the delivery of benefits was delayed and it was impeding the progress of the Cassurubá RESEX. Resource user participation in meetings had been poor during the public deliberative council meetings in 2013 with decisions being made hardly representative of the resource users of the RESEX.

During one meeting in March 2013, government and NGO actors complained that the resource users were disorganized and needed to better organize themselves to represent their interests. They were told to come to the meetings prepared for constructive discussion rather than just complain or cry (*chorar*). This was particularly important for the upcoming first seminar of Public Policies (Políticas Públicas) where "beneficiaries" would be introduced to the potential government incentives available to them. Self-organization is a requirement because, first, the delivery of benefits and incentives to resource user "beneficiaries" requires that they identify themselves by registering with ICMBio, if they had not done so already through the INCRA registry in 2011. Second communities should organize themselves in the form of a formal organization registered by the National Registry of Legal Entities (CNPJ), because many

of the benefits of the Políticas Públicas and RESEX grants for small projects, are delivered to community organizations and not individuals.

Ultimately, resource users are to receive the responsibility for co-management of RESEX. The Cassurubá RESEX thus requires "government through community" (Rose 1999, 176), or in other words, the deployment of community by external actors in order to construct governable subjects and active citizens bounded to the conservation unit through co-management responsibilities (Creed 2006; Li 2007b). After all, "territorial definitions of social relations include molding people to form community" (Sack 1986, 87). Essentially, and drawing from RESEX, community-based conservation, assimilated by "experts" or what Li (2007b) refers to as "trustees," is ontologically and epistemologically fractured. Its existence is sketchy as the orphan, or foster child, (for lack of a better term) of conservation and development agendas making it difficult to measure, control, and the labor of governing difficult.

3.2.4 Managing failures and contradictions

The Cassurubá RESEX since its inception is loaded with a cornucopia of deficiencies including political ones. Moreover, RESEX authorities maintain their power by obscuring contradictions and managing failures through the focus on RESEX "beneficiaries." First, as explained in the results, the polygon of the Cassurubá RESEX was re-delineated in 2013 because RESEX authorities did not inquire of the urban plat of Nova Viçosa. The Municipality of Nova Viçosa and the Ministry of the Environment lobbied Brasilia in 2013 to have the RESEX boundaries changed and they succeeded.

However, only actors with political knowledge and power are able to accomplish such a feat of contesting the boundaries a Federal conservation unit. Resource users, such as the selective logger seeking retribution for the loss of his livelihood activity on *his* land, have little political power to contest the RESEX as such a level. The means to suppress any opposition by resource users is the dictation of Federal laws and rules by ICMBio officials at deliberative council meetings.

Second, as *pescadores* of Nova Viçosa and Alcobaça complained, the RESEX is reinforcing, and causing conflict between *pescadores*, rather than enabling them to unite. Caravelas *pescadores* were still attempting to exclude Alcobaça from the RESEX in 2013. This is in line with Sack's position that "localities will compete among themselves for scarce resources" rather than confront sources of power (Sack 1986, 164). In this case however, it is ICMBio that is not being confronted by resource users. Most *pescadores* of Cassurubá believed that they were not united enough to contest the RESEX or the RESEX manager. Nonetheless, social conflict has ensued between *pescadores* as a result of the Cassurubá RESEX, as was the case for the Corumbau and Arraial do Cabo MERs (Da Silva 2004; De Moura et al. 2009).

Third, four years after the Cassurubá RESEX was decreed, the notion of RESEX "beneficiaries" was still ambiguous to resource users. During the *Políticas Públicas* seminar in 2013 resource users were repeatedly told they had to identify themselves, organize themselves, and register in order to access government benefits. Argument and discussion ensued episodically for two days regarding who was a RESEX "beneficiary"

and what they must do. What constitutes a "beneficiary" is in perpetual reversal and what Rose (1999, 192) refers to as "switch points where an opening turns into a closure." An exemplary exchange occurred after one resource user asked, "who has priority access" to a RESEX. A representative of INCRA responded stating that the RESEX "beneficiaries" themselves determine inclusion and exclusion. A second issue brought up by a resource user was the fact that there are resource users living inside the RESEX, and those residing outside of the RESEX in urban areas, presenting a problem for the definition of "beneficiary." The representative then went on to say he was asked to enter a conversation he had no control over. He stated it was the resource users themselves who needed to identify themselves as a "beneficiary" for access to resources and economic incentives. In response, an NGO actor stated, "This is how the conversation goes…the resource users want the government to recognize them, but the government says first you have to recognize yourselves."

This was (elusive) power in the making, or, as Harvey states, the discursive moment between people: "The games played within discourses are extraordinarily complicated so that the discursive moment is indistinguishable from the exercise of power itself. But this is precisely what is meant by internalization: the discursive moment is a form of power, it is a mode of formation of beliefs and desires, it is in itself an institution, a mode of social relating, a material practice, a fundamental moment of experience" (Harvey 1996, 83). However, the insistence by resource users for clarification of who was a "beneficiary" is in fact contestation or "switches in the opposite direction" and the inability to coerce them "threatens the assemblage" (Li

2007a, 269, 279). Nevertheless, it should suffice to say the RESEX "beneficiary" is ruptured as it lumps all RESEX resource users into a category devoid of individual interests (Ferguson 1994; Li 2007b) and fails to account for the complex livelihoods of Cassurubá, as will be explored in detail in Chapters IV, and V.

3.2.5 Anti-politics: keeping the assemblage governmental

The notion of anti-politics, developed by Ferguson (1994), can be most simply stated as "encouraging citizens to engage in debate while limiting the agenda" (Li 2007a, 265). A quintessential example of practices of anti-politics is the physically and politically inaccessible deliberative council meetings of the Cassurubá RESEX. They are to occur every three months, for a full day, on the mainland in Caravelas. The council was formed in June 2012, yet as of July 2013 only four meetings had taken place. The Cassurubá RESEX resource users are expected not to work and provide their own transportation to attend meetings. It is also physically challenging for resource users to attend meetings, particularly those of the *zona ribeirinha* because of their geographic isolation. Resource user attendance to meetings has been low, yet those who do participate experience the power relations within the RESEX territory.

The council meetings themselves are a stage for power dynamics as resource users hardly have a voice in the debate and they were constantly reminded of their deficiencies, such as lack of organization. In one instance, a *pescador* thoughtfully presented an idea to create a new organization (Associação Mãe) for approximately 20 minutes with synopsis in hand, and the idea was quickly denounced. He was told by

NGO and government "experts" that the ideas were not structured enough and lacked organization, and that "he should arrive with a structured synopsis" and this was followed by mocking of the proposed association name. Even humble attempts at participation and organization are quickly corrected.

In instances of individual contestation against the RESEX, such as questions about gear restrictions, resource user comments were immediately shunned by statements such as "you can't escape the law," "we can't escape the law," "nobody can escape the law," and the ICMBio authorities would change topic. Recall from earlier that resource users are supposed to participate in RESEX rule making. Nevertheless, even mapping was a blatant instrument of knowledge as power. In one instance of limiting the agenda, and avoiding the substantive concerns of resource users, a map of the Cassurubá RESEX polygon was presented in PowerPoint for the purpose of showing boundaries and how a barrier wall had been constructed along the Airport in Nova Viçosa within the RESEX polygon without ICMBio's approval and licensing. This topic was of political concern to government officials, not resource users. The practice demonstrates how the RESEX territory is used to obscure sources of power (Sack, 1986).

More contentious were the concerns of *pescadores* regarding the dredging of the Canal do Tomba. Many *pescadores* have not approved of the dredging since its inception because it destroyed shrimping grounds, loosens heavy sediment making shrimping difficult as the mud gets trapped in the trawlers, and has reduced shrimp catch. Thirty-five percent of resource users stated the dredging was a major threat in the area. In fact, most resource users perceive the dredging as a major cause of decline in

shellfish since the dredging began in 2003. Resource users in council meetings repeatedly brought up the dredging issue; however, ICMBio officials repeatedly closed the debate. For example, one government official declared "this topic is technical and not general" and a resource user responded "this is important for the extractivists because we are impacted [by the dredging]." When several resource users requested to attend the RESEX sub-committee meetings that monitored dredging activities they were again told the issue was technical and there was no need to have resource users attend those meetings.

In October of 2013, two council meetings were held in which various federal laws were read off and dictated to resource users including forestry codes, fishery laws, and IMAMA licensing requirements for constructing improvements. Most significant is the fact that there is no RESEX law stating fallow cannot be cleared and planting is prohibited, yet the RESEX manager and an IBAMA official told resource users that they could not clear fallow and could not plant crops without the RESEX manager's permission. Most resource users contested and one *marisqueira* of the zona *ribeirinha* asked if she could have a garden, and was told she would need to ask the RESEX manager as he would have to see the area and how large it would be. In an attempt to clarify why resource users were told this, I asked the IBAMA official why fallow could not be cleared. He stated there was a law that it could not be cleared once it reached a certain height and he was unsure of the exact height, and concluded that "they must ask [the RESEX manager] permission.

In short, while RESEX resource users are told they should participate in RESEX decision-making and organize themselves, ICMBio is setting the agenda, directing conduct, and consolidating its position as the absolute holder of decisions and institutions, yet redirecting the source of power to the RESEX territory. In other words, while the conceptual apparatus of participatory decision-making "appears bathed in the shining light of day" the actual process of being governed "proceeds silently and often invisibly" (Ferguson 1994, 276).

3.2.6 Reassembling

Li (2007a, 284) refers to reassembling as "grafting new elements onto the assemblage, reworking existing elements for new purposes and transposing the meanings of key terms" In the case of the Cassurubá RESEX, processes related to land and fisheries are being reworked and crafted through the RESEX instrument. As Sack (1986, 164) states, "the sense of participation can serve to legitimate government while meeting few of its citizen's needs. It can also serve different needs of capital."

As mentioned earlier, RESEX territory is "owned" by Federal government. However, with RESEX establishment, the government also (re)grants property access rights within the territory to resource users. In other words, "traditional communities" have collective ownership and access rights to the RESEX. In the case of the Cassurubá terrestrial area, residents had previous private and usufruct rights for generations. Now, resource users have collective rights but not tenure rights, thus cannot sell their land. The land is now a conservation commodity. How did establishment of this RESEX override

previous land titles? In a technical property report of the land proposed for the Cassurubá RESEX, Miranda (2006) states that because property titling within the territory was not registered with the State of Bahia they are considered null and void. He further concludes:

> "Regarding the existence of land under the control of the State Government of Bahia in the area proposed for creation of the RESEX, we believe that there are doubts as to its impossibility, since the Federal Constitution of 1988 did not leave room for different interpretation of that considered coastal islands and marine land which are included among the assets of the Union (art. 20). This assertion follows naturally from the conviction that any domain title granted by the State Executive may be annulled in action itself, for the simple fact that only the holder of the domain can transfer it" (Miranda 2006, 71-72).

The manipulation of text justified the appropriation of land for the creation of the Cassurubá RESEX. It is interesting to note that the terrestrial area of Cassurubá is not comprised of "true" islands but tidal river courses that have carved out the land forming terrestrial islets between the rivers. Notwithstanding, the argument held that the land was never the resource users' in the first place and they were told they were maintaining rights to land with the RESEX.

Resource user households of the terrestrial area of the Cassurubá RESEX had conducted small-scale agricultural activities and had been paying the rural land tax (Imposto Territorial Rural, ITR) for generations. Now they were told the land was not really theirs and activities within the area would be regulated. As mentioned earlier, a

government official stated, "*with the RESEX their situation was being regulated.*" This could not be stated more accurately: no improvements or construction is permitted without ICMBio approval and IBAMA licensing; clear cutting and farming practices are now prohibited; and all residents must register with ICMBio. In lieu of these restrictions residents can register for the Bolsa Verde program, among other government benefits, and observe forest regrowth while being forced to purchase produce from markets in the peri-urban centers that are physically difficult to access. Resource user livelihoods and their relationship with the environment are being reconstituted under the auspices of the community-based RESEX instrument.

Furthermore, several residents of Caravelas stated that government did not really want people residing in the Cassurubá RESEX area and wanted them in the urban center of Caravelas. Since property can no longer be bought or sold, and construction and improvements limited, it is inevitable that in time residents will be "weeded out" of Cassurubá because of processes of urbanization, as had occurred in the last century (Ralile 2006). During a deliberative council meeting posters were distributed showing the urbanized design of a "trendy city." In this sense, the terrestrial area and mangroves of Cassurubá will be a conservation commodity that provides ecosystem services, while labor will be concentrated in urban centers or new neighborhoods with lower perceived conservation value.

Fisheries are also being reworked for the Cassurubá RESEX despite the fact that it has been the main source of subsistence and income for locals for half a century or more. When the RESEX was created, NGOs seemingly reported exaggerated statistics in

their press releases. For example, one CI (2009) press release stated "the creation of the Cassurubá Marine Extractive Reserve means that around 20,000 fishermen who depend on these marine species will benefit from the environmental services offered by the new reserve." And as part of the Abrolhos Seascape expansion 80,000 tourism jobs would be created (CI 2011). It is not clear how the figure of 20,000 was obtained but there are approximately 2,000 resource user households of the Cassurubá RESEX according to statements by Presidents of the Fishermen's Colony (*Colonia de Pesca*). Furthermore, RESEX authorities aim to regulate the fisheries that already exist, and not create more jobs. A socioeconomic survey (Curado 2009) conducted of the Abrolhos Bank reported that approximately 35% of fishermen interviewed were not licensed fishers. In fact, a deliberative council meeting held in October 2013, specifically addressed this issue. Officials of IBAMA and the naval officers discussed the laws and stated that any vessel caught without a fishing license would be apprehended and the owner fined.

With the Cassurubá RESEX, existing jobs are being "deployed to new ends" to reconfigure people, labor and relations (Li 2007a, 284). Rather than resource user livelihoods being improved, they are being accounted for and regulated by government under the veil of community-based conservation. By ensuring that all resident resource users and the land they possess are (re)registered, and fishers licensed, they become documented and democratized citizens with a new relation to the state (Scott 1998) and will gain the benefits the RESEX has to offer. However, it appears that government (CEPENE and ICMBio) and NGOs are gaining the most benefit from the millions of dollars from Fibria's environmental mitigation, the R$450,000 the federal government

granted for the development of the Cassurubá RESEX management plan (CE 2009), and funds from other international and national donors contributing to the RESEX and environmental conservation in general. These processes are reminiscent of the conflict between labor and capital in environmental conservation (Li 2007a; 200b; Sack 1989). Hegemonic groups (government and NGOs) increase their pocket money from large donors, while resource users do the labor of maintaining forests for a humble remittance, and co-manage the reserve gratis. The RESEX also demonstrates the practices of government which involves getting people to act in a way they believe is in their own interest, and the practice of governing "men in their relations with things…wealth, resources, means of subsistence…territory…" (Foucault 1991, 93).

3.3 Conclusion

In this Chapter, I drew from the work of theorists who examine relationships of power within contexts of environmental governance. I particularly drew from Li's (2007a, 287) governance assemblage analytic to examine an instrument "instantiated in a particular programme in a particular place," the case of the Cassurubá RESEX in Brazil. I showed *how* and *why* the RESEX, as a prescribed community-based conservation and development instrument, becomes operationalized in new spaces of coastal-marine conservation priority by actors and elements across scales.

The Cassurubá RESEX was established because of contentious territorial conflict between Bahia's political elite, the federal government's environmental officials, and environmentalists, which obscured the fact that the majority of resource users were mere

pawns wagered in the territorial game. They were "enrolled" with the erroneous idea that they could exclude outsiders from their RESEX and could access political and economic benefits that would improve their livelihoods. The case provides evidence that RESEX establishment is a "practice of assemblage" in which various actors and elements are brought together to produce a desired result: to govern people, resources, and their relationships (Li 2007a; 2007b). To accomplish this, attention must be drawn away from the sources of power (Sack 1986, Ferguson 1994) and the focus on improvement and protecting livelihoods of resource users. In other words, livelihoods can be seen as "a point of entry" for expansion of bureaucratic state power (Ferguson 1994, 255). This led to my conclusion that the RESEX is a territorial instrument of control over people, resources, and relationships in a geographic space. This extends my quasi-hypothesis; MERs comprise a conservation agenda that curtails access to resources negatively impacting livelihoods (Neumann 2004; West and Brockington 2006; Li 2007b; Larson and Soto 2008; Lele et al. 2010; Robbins 2012). The hypothesis stands correct in this case, as access to resources have been re-configured and restricted through the RESEX, yet it does not account for power relations, which are integral to territorial battles over resources.

The contradictions between the RESEX instrument and how it was deployed, the state of knowledge, the ensuing social conflict, and contestation by resource users demonstrates that the labor of governing is messy and challenging as was shown in Li's case in Indonesia (Li 2007a; 2007b). The case also demonstrates how State power flows in "local, capillary forms rather than its centralized point" (Dean 2013, 24). The ICMBio

RESEX manager and his excising of power through Federal and RESEX intuitions are a case in point. Cassurubá RESEX resource users, as is the case with other RESEX, have no choice but to assume their position of "beneficiary" in order to maintain or (re)gain access to resources, as will be elaborated in detail in Chapter V.

CHAPTER IV

LIVELIHOOD STRATEGIES IN THE CASSURUBÁ RESEX: IMPLICATIONS FOR CONSERVATION PLANNING

In this chapter I examine the livelihood practices and strategies of Cassurubá extractive reserve (RESEX) resource users and compare them to new institutions. I ask: Is there dichotomy between market oriented and subsistence based households of the Cassurubá RESEX? If so, are there differential impacts on livelihoods from establishment of the Cassurubá RESEX and new institutions? How and why do the impacts differ? I examine the quasi-hypothesis that conservation and development agendas need to consider the differential livelihood strategies of resource users or efforts will be undermined (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004b; Carr and McCusker 2009; Lansing 2009; Walker and Robinson 2009; Chowdhury 2010; King 2011; Carr 2013).

I answer these questions and test the quasi-hypothesis by adapting the capital assets and capabilities approach (Bebbington 1999; Bebbington et al. 2006) and drawing upon other livelihoods studies using statistical techniques (Coomes and Burt 2001; Coomes 2004; McSweeney 2004b; Chowdhury 2010). Specifically, the data are drawn from a household survey administered to 122 households in 2013, as discussed in Chapter II, with household demographic and asset data. Using K-means cluster analysis, household typologies emerged based on household income from fisheries and percent catch sold. These typologies were then examined using independent chi-square tests to

determine relationships between household assets and household cluster membership (the methods are elaborated in more detail in Chapter II). I then compare the household typologies with newly instated RESEX institutions. I demonstrate how new institutions of the Cassurubá RESEX have produced differential impacts on resource user livelihoods. The institutions conflict with livelihood strategies of low income households; and low income households, particularly subsistence-based households, are the most impacted by the new rules. The findings support the quasi-hypothesis stated above.

The Cassurubá RESEX is comprised of marine and terrestrial spaces, as I discussed in Chapter II. Resource users residing in the terrestrial area, or *zona ribeirinha* (riverside zone), refer to themselves as *moradores* (residents), *lavradores* (farmers), *marisquieros* (shell fish extractors), *pescadores* (fishermen), or a combination of above. They conduct(ed) small-scale farming, raise livestock, extract crustaceans (mangrove crab, blue land crab) and mollusks (clams, mussels) from the mangroves, and fish in the tidal rivers. The resource users of the peri-urban areas of Caravelas and Nova Viçosa are *pescadores* that fish; reef fishes along off-shore reefs; shrimp and drums along the shore; bonito in the open sea; and sometimes river fish in the rivers. There are also *marisquieros* and *marisqueiras* who extract crustaceans and mollusks by crossing the Caravelas River to access the mangroves in the *zona ribeirinha*. The latter include the majority of women who clean shrimp at fish markets in the peri-urban centers.

4.1 Results

4.1.1 Household demographics and assets

Households of the Cassurubá RESEX are predominately native to municipalities of the RESEX (Table 4.1), indicating that households have been established in the area and are not recent in-migrants. The head of households surveyed were comprised of 89 males and 33 females between the ages of 18 and 80 (mean age of 43.63). Sixty-one percent identified themselves as *pescadores* (fishermen), 22% as *marisqueiras* (female shellfish extractors), 3% as *lavradores* (farmers), and 2% as *marisqueiros* (male shellfish extractors). The remainder considered themselves a combination of these. The number of years extracting resources ranged from 1 to 65 years with a mean of 28.76 years and the mean time at residence was 19.21 years. Each household had between 1 and 10 residents with a mean household membership of 3.54. In terms of household extraction labor, the mean number of male and female workers was 1.07 and 0.53 respectively. The mean number of dependents was 1.30. Finally, 41 household heads (34%) had no education, 44 (37%) had not completed some primary school, 30 (25%) completed primary school and only 4 (3%) completed secondary school.

Table 4.1 Household demographic and asset data

Access (n=122)	**Yes**	**No**	**I don't know**	**Not yet**
Attend RESEX meetings	9%	91%		
Learned skill from family	92%	8%		
Access to land	55%	45%		
Beneficiary?	30%	52%	8%	10%

Table 4.1 Continued

(n=119)	**Mean**	**SD**
HH age	43.63	12.69
Years at residence	19.21	15.71
Years extracting	28.76	12.24
# Residents	3.54	1.75
# Male extractivists	1.07	0.53
# Female extractivists	0.53	0.71
# Dependents	1.30	1.59
Household extraction income	799.22	418.80
Household value of boat and gear	9595.04	14219.44
# Household extraction arts	2.92	1.57

	Frequency (*n, %)*	**n**	**%**
Identity	Pescador	75	61
	Marisqueira	27	22
	Marisqueiro	3	2
	Lavrador	4	3
	Marisqueira & pescador	5	4
	Pescador & marisqueiro	4	3
	Pescador & lavrador	2	2
	Marisqueiro & lavrador	1	1
	Marisqueira & lavrador	1	1
Formal education	None	41	34
	Some primary	44	37
	Primary complete	30	25
	Secondary complete	4	3
Boat ownership	Yes	62	52
	No	57	48
Gear ownership	Yes	76	64
	No	43	36
Boat type	No boat	57	48
	Motor boat	43	36
	Rowboat	16	13
	Canoe	3	3
Habitat fished	Shore	41	35
	Open sea	20	17
	Corals	21	18
	River	12	10
	Mangroves	23	20
Household location	Caravelas Centro	33	27
	Ponta de Areia	15	12
	Barra de Caravelas	14	11
	Nova Viçosa	29	24
	Zona Ribeirinha	28	23
	Alcobaça	3	2

Household income from RESEX extraction ranged from R$150 to $2,200 per month with a mean of R$799.22, slightly higher than the Brazilian monthly minimum wage of R$678. Household value of boat and gear ranged from R$0.00 to R$63,750 with a mean of R$9,595.04. Fifty-two percent of households own a vessel and 48% do not. Vessel-owning households primarily have motorboats (36%), rowboats (13%), and canoes (3%). Sixty-four percent of households own their own gear and 36% do not. In regard to primary fishing habitat, 35% of households fish along the shore, 17% the open sea, 18% from corals 10% in the river and 20% extract from mangroves. Finally, 24% of the households surveyed were from the *zona ribeirinha*. The households surveyed of the peri-urban fishing communities are Caravelas Centro (29%), Nova Viçosa (24%), Ponta de Areia (13%) and Barra de Caravelas (12%). In regard to access to RESEX benefits, 91% did not regularly attend RESEX council meetings, 92% learned their extraction skill from family, 55% have access to land in the *zona ribeirinha*, and 52% said they were not a beneficiary (Table 4.1).

4.1.2 Cluster analysis

Three clusters emerged from K-means cluster analysis (Table 4.2 and Figure 4.1) with considerable Euclidean distances of 926.29 (between clusters 1 and 2), 759.94 (between clusters 1 and 3) and 172.064 (between clusters 2 and 3), with the distances represent the difference between the means, or centroids in cluster analysis terms, of each cluster. The analysis yielded three clusters, rather than two, because of the high variance of income in market oriented households. Figure 4.1 shows slight overlap

between clusters, however, distances between cluster centroids, or means, were significant. Cluster 1 comprises 19% of the sample with 22 households that are market oriented with high incomes (means=93.87%, $1455.25); cluster 2 comprises 17% of the sample with 20 households that are subsistence based with low incomes (means= 44.97%, $530.25); and cluster 3 comprises 64% of the sample with 75 households that are market oriented but with low incomes (means= 93.58%, $695.30).

Table 4.2 K-means cluster analysis results

Cluster (means)	**Average % market**	**$ Household income from fisheries**	
1	93.9	1,455.3	
2	45.0	530.3	
3	93.6	695.3	
Cluster (distance)	**1**	**2**	**3**
1	0	926.29	759.94
2	926.29	0	172.06
3	759.94	172.06	0

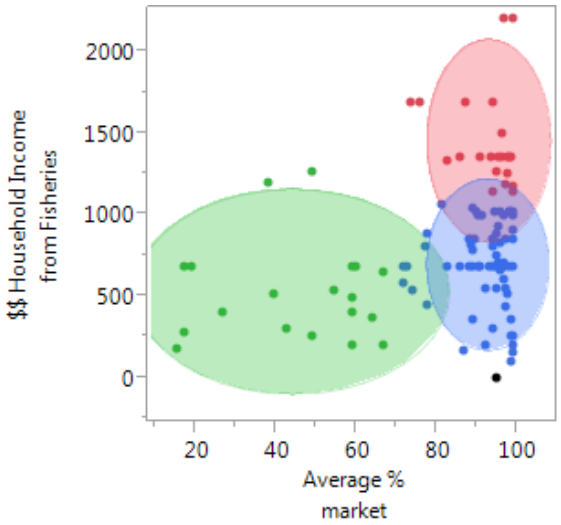

Figure 4.1 K-means cluster scatterplot matrix: JMP output of scatterplot matrix of clusters and points.

4.1.3 Pearson's chi-square analysis

Pearson's chi-square analysis clarified why market oriented households divided into high and low–income groups. There is some overlap between variables that determine cluster membership. However, significant relationships emerged between each cluster and the variables: habitat extracted, type of boat, household location (peri-urban versus *zona ribeirinha*), household head age, years extracting and education level, and number of household members (Tables 4.3, 4.4 and Figure 4.2). There was no significant difference between each cluster's household value of boat and gear, number of male and female workers, number of dependents or household number of fishing arts. In addition, qualitative data that was not fit for statistical analysis further validate the household typologies.

Table 4.3 Pearson's chi square results

Variable	**n**	**df**	**Chi Square**	**Prob> ChiSq**
Habitat	117	8	27.930	0.0005
Boat type	117	6	22.696	0.0009
Location	117	8	49.386	0.0001
Value of gear & boat	117	2	3.6557	0.1608
HH education	117	6	25.122	0.0003
HH age	117	2	7.837621	0.0199
Years extracting	117	2	14.00249	0.0009
# Household residents	117	2	6.13924	0.0464
# Male extracting	117	2	5.955915	0.0509
# Female extracting	117	2	3.748117	0.1535
# Dependents	117	2	2.449071	0.2924
Household # fishing art	117	2	1.647399	0.4388

Table 4.4 Household demographics & assets (clusters)

Continuous variables (n=117)	**Cluster** *(mean, SD, min and max)*		
	1	**2**	**3**
Head of household age	41.23	50.75	42.12
	9.08	13.85	12.76
	23.00	29.00	18.00
	59.00	80.00	75.00
Years at residence	17.55	23.55	18.28
	13.43	12.53	16.66
	1.00	3.00	0.50
	52.00	54.00	72.00
Years extracting	27.14	37.50	26.33
	10.38	13.37	10.99
	5.00	14.00	1.00
	42.00	65.00	57.00
# Dependents	1.64	1.60	1.13
	1.59	2.39	1.32
	0.00	0.00	0.00
	4.00	8.00	5.00
# Residents	4.09	4.10	3.25
	1.44	2.57	1.53
	2.00	1.00	1.00
	7.00	10.00	7.00
# Male workers	1.27	1.20	0.99
	0.63	0.70	0.45
	1.00	0.00	0.00
	3.00	3.00	3.00
# Female workers	0.77	0.85	0.55
	0.75	1.04	0.58
	0.00	0.00	0.00
	2.00	4.00	2.00
# Dependents	1.64	1.60	1.13
	1.59	2.39	1.32
	0.00	0.00	0.00
	4.00	8.00	5.00

Table 4.4 Continued

Continuous variables (n=117)	**Cluster** *(mean, SD, min and max)*		
	1	**2**	**3**
Household value of boat & gear	13306.77	5311.95	9610.96
	15021.93	6237.01	15362.66
	0.00	0.00	0.00
	53050.00	16872.0	63750.00
Household % market sales	93.88	44.98	93.58
	7.37	18.66	7.15
	74.63	16.25	72.50
	100.00	67.50	100.00
Household income from fisheries (R$)	1455.25	530.25	695.30
	297.84	300.85	247.66
	1139.00	175.00	100.00
	2200.00	1267.00	1060.00
# Household extraction arts	3.28	3.1	2.81
	1.45	1.29	1.68
	1	1	1
	7	5	11

Table 4.4 Continued

Categorical variables (n=117)		**Cluster frequencies** (*n, %)*					
		1		**2**		**3**	
Identity	Pescador	17	77	5	25	50	66
	Marisqueira	2	9	7	35	18	24
	Marisqueiro	0	0	2	10	1	1
	Lavrador	0	0	2	10	0	0
	Marisqueira & pescador	2	9	1	5	2	3
	Pescador & marisqueiro	1	5	1	5	2	3
	Pescador & lavrador	0	0	0	5	2	0
	Marisqueiro & lavrador	0	0	1	0	0	3
	Marisqueira & lavrador	0	0	1	5	0	0
Formal education	None	6	27	16	80	18	24
	Some primary	8	36	3	15	33	44
	Primary complete	6	27	1	2	22	29
	Secondary complete	2	9	0	0	2	3
Boat ownership	Yes	13	59	14	70	34	45
	No	9	41	6	30	41	55
Gear ownership	Yes	16	73	17	85	42	56
	No	6	27	3	15	33	44
Boat type	No boat	9	40	6	30	41	55
	Motor boat	12	55	6	30	24	32
	Rowboat	1	5	5	25	10	13
	Canoe	0	0	3	15	0	0
Habitat extracted	Shore	7	32	4	20	35	47
	Open sea	3	14	0	0	17	23
	Corals	8	36	0	0	8	11
	River	0	0	6	30	4	5
	Mangroves	4	18	10	50	11	15
Household location	Caravelas Centro	6	27	0	0	26	35
	Ponta de Areia	4	18	0	0	11	15
	Barra de Caravelas	4	18	1	5	9	12
	Nova Viçosa	6	27	3	15	19	25
	Zona Ribeirinha	1	5	16	80	9	12
	Alcobaça	1	5	0	0	1	1

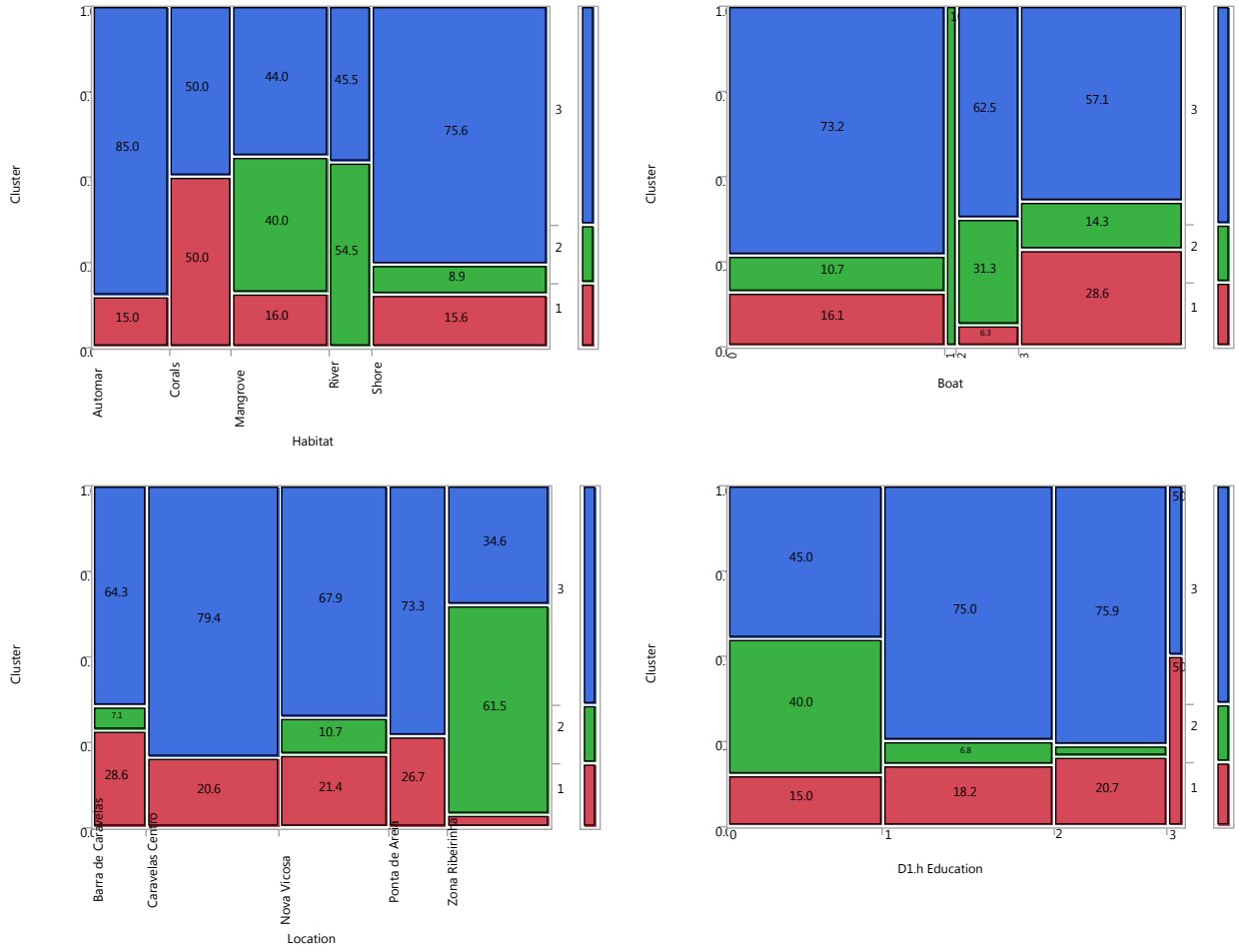

Figure 4.2 Chi-square mosaic plots of clusters. JMP output of chi square contingency analysis, for categorical variables (habitat, location, type of boat, and education level), showing percent (numbers) and counts (proportion) of cluster variables. The *y-axis* shows the response probability (0-1) with the entire axis=1 representing the total sample. For boat: 0= no boat, 1= canoe, 2= rowboat, 3= motorboat; and for education, 0= no education, 1= some primary school completed, 2= completed primary school, and 3= completed secondary school (high school).

4.1.4 Examination of clusters

4.1.4.1 Cluster 1: high income, market orientation

Cluster 1 (22 households, 19% of sample) had the highest reported incomes and fish mostly in coral areas (Figure 4.2). Of all coral fishing households, half (50%) are in this cluster. Eight households fish in corals, but these households also rely on mangroves (4), shore fishing (7), and open sea (3). No household relies on river fishing. Most households of cluster 1 own motorboats (12), nine do not own a boat, one has a rowboat and none own a canoe. Twenty-one of these households live in peri-urban communities outside of the RESEX polygon, and only one is in the *zona ribeirinha* which is inside the RESEX polygon (Figure 4.3). Low levels of formal education characterize this and other groups: 27 % of household heads have no formal education, 36% completed some primary school, 27% completed primary school, and 9% completed secondary school. Also, this cluster is comprised of the younger head of households that have been extracting for less time than cluster 2.

The reason for the high income status of cluster 1 households is that they target high value coral species such as groupers and snappers for export to larger cities. These reef fishes are rarely consumed by locals because of their high market value. Therefore, these households report higher incomes than the shrimp and bonito fishing households identified in cluster 3 (below). Despite the high value of the reef fishes, cluster 1 households have low investment in boats and gear. They have lower boat ownership, use lower value gear and spend less on fuel compared to cluster 3. These fishermen tend to go out to sea for 3-7 day periods and they fish mainly with hooked lines, harpoons, and

long lines with values of $15, $200, and $300 respectively. Therefore, there is no need to replace damaged gear, which becomes costly as in the case of shrimpers and bonito fishermen. High investment in gear and fuel is unnecessary for these households to maintain high incomes. Furthermore, reef habitats can be fished year round, weather permitting, and the only fishing restrictions are on sizes of particular species caught. Therefore, they are not impacted by fishery closures, as is the case with shrimpers and drum fishermen in cluster 3.

A representative household in this cluster is located in Caravelas Centro. The head of household is a diving *pescador* of 35 years of age. He fishes coral species, such as groupers and snappers, with harpoon and lines for three to five day trips mostly in summer when coral fishes are more active and when the southern wind is not present. In winter he line fishes a snapper (*Griacó*) species that is present in open sea, muddy bottom areas. When he dives he is able to go fifteen meters down to harpoon a fish. Although, he only began diving ten years ago, he learned to fish with nets at age twelve. He owns his own boat, which is valued at $35,000 because of its strong motor. The species he captures are highly valuable, therefore he reports an income (~R$2,025) that is triple that of the Brazilian minimum wage and much higher than most *pescadores* of shrimp and bonito. He has no children and lives with his housewife who helps him sell his fish to middlemen. He enjoys his work as he stated "*if I couldn't [fish] I would have no interest because for me its fishing* (PECACE19, 07/26/2013).

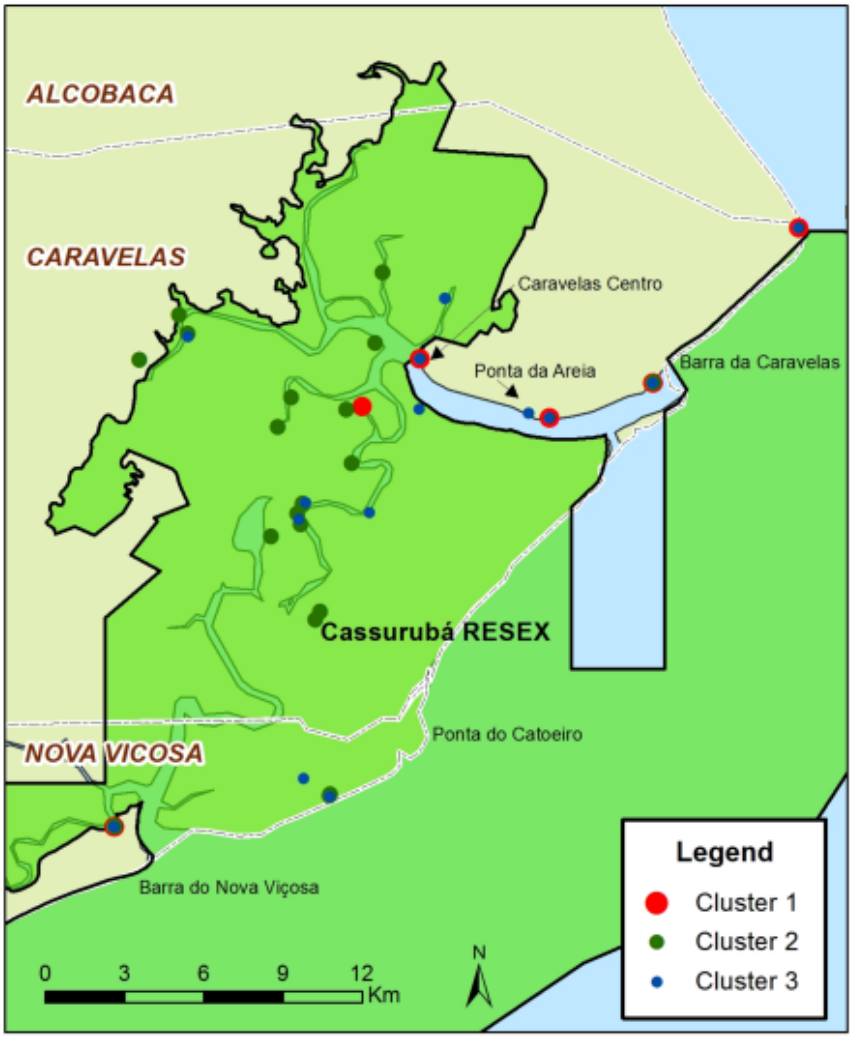

Figure 4.3 Geographic locations of households based on cluster. Not all household points are visible and many overlap.

4.1.4.2 Cluster 2: Low income, subsistence orientation

Cluster 2 (n = 20, 17%) is comprised of subsistence-based households who have low market orientation and the lowest reported incomes of the three clusters. These households mainly extract RESEX resources from near-shore habitats, which provide

relatively low value resources, or resources that cannot be processed and marketed in timely manner. This cluster comprises 54.5% of all households fishing in the river and 40% of households extracting from mangroves (Figure 4.2). None of these households extract in open sea or coral areas. Also, this is the only cluster reporting ownership of canoes, the least expensive form of water transport, but which requires use of timber. Three of the households own canoes, 5 own rowboats, 6 own motorboats and 6 do not own a boat. This cluster is also defined spatially as 16 of the households (61.5% of all cluster households) live in the *zona ribeirinha* and only 4 households live in peri-urban communities (Figure 4.3). This cluster has the lowest household head educational level of the three clusters. Eighty percent of the household heads have no education, 15% completed some primary school, 5% completed primary school and none completed secondary school. These longer-term households have more household members, and have older head of households that have been extracting longer than the other clusters. Finally, almost half of these household heads are *marisqueiras*; they are 11 men and 9 women head of household, although there was no chi-square statistical difference between clusters.

Within cluster 2 households, 50% extract from mangroves, 30% fish in the river and 20% along the shore. They have low value vessels (rowboats and canoes) and gear. Shellfish extractors of this group use machetes, hooks or their hands with the former two costing between R$10-20. Also, nets used for fishing in the river or along the shore typically cost between $100 and $600, yet few numbers of nets are used. More importantly, these households depend on the RESEX resources more for subsistence

than income. These households are in the *zona ribeirinha* that is difficult to access, with no refrigeration, no potable water and no basic sanitation. The homes have solar energy for lighting and recharging small gadgets, such as cell phones, but not enough to power large appliances. Therefore these households must regularly extract resources for consumption. They mostly eat mainly low value river fish and sometimes crustaceans and mollusks, as when they do extract for income there is a high market value for shellfish. Species such as mangrove crab, blue land crab, oysters and clams are highly valued locally and externally, and are also exported to larger cities. However, extraction for profit is dependent on several factors.

First, extraction depends on the tides; the mangroves are inaccessible during high tides when they are inundated and most shellfish extractors wait to extract until the extreme low tides that occur twice per month for a few days. Second, ice is required for preserving the product, but obtaining ice is a challenge for households in farther areas of the *zona ribeirinha*, particularly those who do not own a motorboat. It takes 2-3 hours to access the urban area through motorboat, and a canoe or rowboat takes requires twice the time. Essentially, household effort for market extraction is more sporadic in these subsistence households, which are somewhat isolated geographically, in comparison to the market oriented households of clusters 1 and 3. Finally, the lower educational level of these households is because of the historic absence of schools in the *zona ribeirinha*. Schools were not established in the *zona ribeirinha* until a decade ago, and prior to the construction of the four schools, these households did not have access to education or the daily means to reach the peri-urban areas for daily education.

As explained in Chapter II, 1,000 inhabitants farmed the fertile soils and exchanged or sold their product at the weekly market in Caravelas Centro occupied the *zona ribeirinha*. Staple foods produced include sugar cane, beans, corn, squashes, bananas, coconuts and manioc, the latter of which remains a staple food today in the form of manioc flour. However, the number of residents reduced with migration to the peri-urban areas of Caravelas and Nova Viçosa in the last century, as they were in search of better lives (young adults) and education for their children (older adults) (Ralile 2006). Those that remained continued their livelihood practices of farming, and extracting and fishing from the mangroves and river, extending to five generations.

The meshed livelihoods of the *zona ribeirinha* and peri-urban areas remain intact today as 55% (n-122) of the resource users in this study either have access to land in the *zona ribeirinha*, or family member that does, and 33% were born in the *zona ribeirinha*. The majority of households of the *zona ribeirinha* (22 of the 24 homes surveyed) have been established for generations and it is not a recently settled area (Ralile 2006).

A representative household in this cluster is located along *Rio de Largo*. The female household head is a *marisqueira* of 48 years of age. When asked how she identifies herself she stated "*I am a marisqueira, I learned from my mother and father when I was a little girl*" (MOCALA02, 09/22/2013). Her husband (age 63) is a retired farmer and they have 2 sons, 2 daughters, a daughter-in law (adults) and 2 grandchildren residing on the property. She and her children extract crustaceans and mollusks such as mangrove crab, blue land crab, oysters and clams from mangroves, during low tides, with their hands, machetes, and traps. It is a labor intensive and a "dirty" job as they

often cut their hands and feet on the sharp oyster shells buried in the mud and attached to mangrove roots. Her sons also extract river fish with artisanal nets (*camboa*, which is now prohibited to use). Their modes of extraction and transport are with a canoe and a rowboat, and they sell only 60.75% of their catch as the remainder is for consumption in the isolated area. They previously farmed manioc for consumption, but new institutions have prohibited farming in the RESEX, as explained in Chapter III.

4.1.4.3 Cluster 3: Low income, market orientation

Cluster 3 is comprised of 75 households (64% of sample) with low incomes yet high market orientation. This is the largest and most diverse of the three clusters. Although these households fish mainly along the shore (70.7% of all households) and in the open sea (85% of all households), they extract from diverse habitats. Thirty-five of these households fish along the shore, 17 in open sea, 8 in coral areas, 11 in mangroves, and 4 in the river. These households also have a large number of boat owners (45%) and non-boat owners (55%). Forty-one households do not own a boat, 24 own a boat, 10 own rowboats, and none own a canoe. Sixty-six households live in peri-urban communities surrounding the RESEX, but only 9 live in the *zona ribeirinha*. Twenty four percent of household heads have no education, 44% completed some primary school, 29% completed primary school and 3% completed secondary school. Twenty of these household heads are *marisqueiras* and 55 are *pescadores*.

Households in cluster 3 maintain lower incomes than cluster 1 despite high market orientation and high investment in boat and gear. They fish mainly shrimp and

drums along the shore, and bonito in the open sea. All three fisheries require costly gear. For example, a shrimp trawling net costs ~R$1,200, a drum net ~$250 and bonito nets cost ~$300; drum and bonito fishing require up to 50 nets. The shrimp and bonito nets tend to damage easily and require frequent repair or maintenance, as is the case with owning motorboats. Moreover, shrimping is the largest fishery in the area, yet these households report less than half the income of reef fishermen. Shrimping, drum fishing, and bonito fishing are less lucrative than coral fishing, which is shown in the data of mean household income (Tables 4.2 and 4.4). Most shrimp is also exported to larger cities but are sold by middlemen for three times the price, or more, than sold by fishermen (R$2.50 kg).

Most households with *marisqueiras* who work cleaning shrimp are included in this cluster (60.6% of female head of households of all three clusters). Women also depend on shrimping for their livelihoods because the main employment in the area for women is cleaning shrimp for R$1.00-2.50/kg. Cluster 3 households also diversify their fishing strategies; shrimpers tend to alternate to bonito fishing during shrimp closers that occur twice per year (for 45 days in April and November) or when shrimping is weak. And bonito fishers alternate to shrimping when humpback whales are in the area from June to November as the whales pose a life risk.

Shrimping and bonito fishing are the most labor intensive and physically demanding work of the three clusters. Shrimping is the most costly as more fuel is required for "dragging" the heavy net (manual trawling) which strains the motor, and the spine, and these fishermen depart anytime between midnight to 4:00am and return

the next afternoon between 2:00 and 4:00pm. Bonito fishermen also follow this daily schedule but more often make 2-3 day trips to sea. Overall, the dichotomy between clusters 1 and 3 is mainly determined by habitat extracted from, or species targeted, and income, as both clusters have high market orientation which classifies these households as market oriented as opposed to cluster 2.

A representative household in this cluster is located in Caravelas Centro. The household head (50 years of age) alters his fishing between shrimp and bonito dependent upon season and shrimp closures. His wife is a *marisqueira* that cleans shrimp for a fishery and their son who resides with them (35 years of age) is also a fisherman, on his father's boat. The household head owns a motorboat and gear (50 bonito nets and 2 shrimp nets). They fish 5-6 days per week weather permitting, and leave home between 2:00-4:00am to return 12 hours later. The household head learned to fish in 1983 from colleagues, although he was born in the *zona ribeirinha* and his father was a farmer.

4.1.5 The fishery agreement

As discussed in Chapter I, a fishery agreement (*Acordo de Pesca*) (ICMBIO 2013b), was established in April 2013 by authorities of the Cassurubá RESEX and deliberative council in order to promote sustainable fisheries of the area. Only eleven active *pescadores* where present when the agreement was established (Nobre and Schiavetti 2013). The laws include, but are not limited to, the following: Motorized boats must fish 500 meters from the shore along the Ponta do Catoeiro to Barra de Nova Viçosa, and are not allowed to fish inside the rivers; each drum fishing boat is limited to

30 *tainheira* nets and the mesh must be at least 35 mm; each bonito fishing boat is limited to 40 bonito nets and the mesh must be at least 45mm; placement of drum nets must be parallel to the shore (rather than perpendicular as it obstructs shrimping boats); and it is illegal to fish drum during the shrimping closures in April and November.

4.2 Discussion

4.2.1 Household typologies and the RESEX territory

The results provide important insight into the diverse resource extraction strategies of resource users of the Cassurubá RESEX. Three distinct household typologies emerged based on market orientation and income. Market oriented households cluster into high income (cluster 1) and low income (cluster 3) groups. The other cluster (cluster 2) is subsistence based, low income households. The market oriented, high income households mainly target high value coral fishes for export to larger cities; they also have relatively low investment in boats and gear and fish year round depending on weather. Household heads are younger and have been extracting for less time than cluster 2. This cluster has the least number of *marisqueiras* of all three clusters.

The market oriented, low income households of cluster 3, the most numerous of the clusters, have diverse extraction strategies, yet they mainly, and alternatively, target shrimp, drums and bonito for export. Despite high investment of boats and gear these are low profit fisheries with households reporting less than half the income of cluster 1 households that target coral fishes. Cluster 3 households tend to alter between shrimping,

bonito, and drum fishing dependent upon shrimp closures, low shrimp production, and or the presence of humpback whales which pose a life risk to bonito fishermen. Moreover, these households engage in the most labor intensive and demanding work, and include the low paid *marisqueiras* who clean shrimp. This cluster consists of the most number of *marisqueiras* of the three clusters.

Subsistence households of cluster 2 are based in the *zona ribeirinha* and extract mainly for consumption because of their geographic isolation and the lack of refrigeration. With longer-term residence these households have the most members and household heads are older, have been extracting longer, and have lower education than the market oriented clusters. Almost half of the head of households in this cluster are *marisqueiras.* They extract various crustaceans and mollusks from mangroves, and fish in the river or along the shore with low value gear, rowboats and canoes, or no boats at all. Although market value for mangrove species is high, market orientation is sporadic because of fluctuating tides make mangroves inaccessible and ice is difficult to obtain. With resource user households classified, I now turn to discussion of how the household typologies intersect with recently instated institutions of the Cassurubá RESEX.

4.2.2 Effects of RESEX institutions on livelihood strategies

Comparison between RESEX institutions regarding rules of use and resource user livelihood strategies indicates five contradictions that resonate well beyond the Cassurubá case study. As in other studies (Lansing 2009; Walker and Robinson 2009), new fishery institutions conflict with existing resource user extraction strategies.

However, informal rules of use for the terrestrial area of the Cassurubá RESEX add an unexpected contentious dimension to this case.

First, the rule that prohibits motorized boats to fish within 500 meters from the shore will negatively affect some of the market oriented, low income households (cluster 3), and subsistence households (cluster 2). These households with small vessels, such as small motor boats and motorized row boats, will be unable to extract along the shore as they cannot go as far out to sea as the more powerful motor boats. Drum fishing occurs along the shore and this suggests that this activity will displaced, again, restricting households with smaller vessels from this activity. Shrimping also occurs along the shore particularly during winter months as the shrimp are in the warmer and muddy near-shore areas. During summer when the muddy water gets too warm, the shrimp disperse to more open water. Therefore, this institution will greatly reduce the shrimp catch during winter months. This seasonal-institutional disparity was a major complaint by shrimpers during this study. Further, if shrimp catch is reduced because of this institution it will impact *marisqueiras* who clean shrimp.

Second, laws restricting number of bonito and drum nets and their mesh size will negatively affect cluster 3, the market oriented, low income households. The new law limits the number of bonito nets to 40 with minimum mesh size of 45mm, and number of drum nets to 30 with minimum mesh size of 35mm. Although this will have a positive effect of reducing the catch of immature fishes and promoting sustainable fisheries, *pescadores* of drum and bonito had been using smaller mesh sizes and more nets (50-60 nets). The *pescadores* were allowed until the end of 2014 to replace their nets. However,

this institution causes a net average financials loss of gear ranging from R$12,500 to R$16.500. Despite the large donations in support of the RESEX made by sponsors, such as the major eucalyptus producer Fibria discussed in Chapter II, incentives or compensation for the temporary loss is non-existent.

Third, the prohibition against drum fishing during shrimp closures contradicts the diversification strategies of shrimp and bonito *pescadores* found in cluster 3. Shrimpers tend to switch to drum or bonito fishing during the shrimp closures that occur annually in April and November in order to maintain a steady income stream and, in the words of one shrimper, "*eu não posso ficar parado*." The *pescadores* associated with the *Colonia de Pesca* (Professional Fishermen's Colony) receive payment for the 45 days of shrimp closure; however, the installments arrive after the fact and they prefer to continue working. Also, bonito *pescadores* alternatively shift to shrimping or drum fishing during the risky hump back whale season from June to November, during the winter season when shrimp are in near-shore muddy waters as previously mentioned. Therefore, the 500-meter law has also undermined bonito *pescadore's* alternative extraction strategy.

This brings me to my fourth point; fishermen/women associated with the *Colonia de Pesca* holding professional fishing licenses are unable to diversify their livelihoods beyond fisheries. The Ministry of Fishing and Aquaculture (*Ministério da Pesca e Aquicultura*) prohibits anyone holding fishing licenses to have employment other than fisheries (Instrução Normativa Nº 2, Chpt 2 Art.4, 2011). If someone is discovered to have a "job" in addition to fisheries their license will be revoked and past contributions made to the *Colonia de Pesca* are null and void. This Federal institution places RESEX

resource users in a difficult position. Many would like a means of income in addition to fisheries. Several *pescadores* stated that they had previously lost their fishing license because of having side jobs, as masons, a common secondary source of employment for men in the area. Furthermore, the Federal law undermines conservation goals to reduce pressure on fisheries through diversification of livelihoods and finding alternative streams of income for fishermen.

Fifth, a noteworthy informal institution, which emerged with the Cassurubá RESEX, is that resource users residing in the *zona ribeirinha* (*moradores*) are prohibited from clearing fallow for farming, reversing years of practice. Although the Cassurubá RESEX does not have a management plan or formal rules of use for the terrestrial area, *moradores* have been told by the ICMBio RESEX manager they cannot plant crops. Recall that these are the subsistence riverside households of cluster 2. These low income households that once depended upon farming for food security and small profit are "forced to purchase produce from external markets," as stated by one *marisqueira*, among others. Although the government provides compensation for reforestation of the RESEX terrestrial area, through the *Bolsa Verde* project mentioned in Chapter II, many former farmers have shifted to fisheries in recent years since they can no longer farm for subsistence or profit. This shift also undermines sustainability goals to reduce pressure on fisheries of the RESEX.

4.2.3 Reconfiguring livelihoods

Although new institutions of the Cassurubá RESEX may foster sustainability of resources, these institutions undermine livelihood strategies of the resource users that the RESEX model aims to protect. These findings support the argument that existing household livelihood strategies of resource users should inform conservation and development agendas (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004a, 2004b; Carr and McCusker 2009; Chowdhury 2010; Carr 2013). More specifically, RESEX institutions should be designed in consideration of the livelihood diversification strategies of resource users and better reflect their needs, including those of women, as the RESEX model suggests. The results of this research, and existing empirical evidence, suggest that data on the livelihood practices and strategies of resource user households is either non-existent, poorly obtained, or disregarded when establishing MPA institutions and management plans leading to unintended impacts on resource users.

For example, in Honduras, social capital shaped marine resource extraction that conflicted with the MPA management plan (Lansing 2009). In the case of Cassurubá, RESEX authorities overlooked extraction and diversification strategies of resource users when creating the fisheries agreement. Specifically, the 500-meter law undermines the livelihoods of shrimp, bonito and drum fishing households, particularly those that are low income with less powerful boats (cluster 3). These households are comprised of the *marisqueiras* that clean shrimp and if shrimp catch is reduced their livelihoods are undermined as well. As in Lansing's case, household social and human capital in the

Cassurubá also determine the particular form of extraction, which is learned from parents or other family members and maintained throughout their lifetime, according to over 90% of the fisherfolk interviewed. Resource extraction typically occurs with family members and extended kinship networks as indicated by the fishing communities of the Cassurubá RESEX.

The majority of bonito and shrimp fishermen are concentrated in the larger peri-urban communities of Caravelas Centro and Nova Viçosa, the few coral fishermen are mainly in the smaller communities of Barra de Caravelas and Ponta de Areia and most extractors of mangroves and the river are concentrated in the *zona ribeirinha* (Figure 4.3). The livelihoods of the resource users of the Cassurubá RESEX therefore are spatialized. As stated by King (2011, 309), resource extraction and access is "structured by social relations expressed through space." MPA institutions may reconfigure these spaces of extraction as shown in Walker and Robinson's (2009) case where the creation of an MPA impacted the younger fisherfolk, with fewer assets, who were unable to travel as far for fishing in open areas. This is similarly the case in Cassurubá, as households with fewer gear assets (smaller vessels with weaker motors) are unable to travel as far. However, these households tend to have older fisherfolk and include those of the *zona ribeirinha* (cluster 2).

However, the findings of Cassurubá were contrary to other studies that determined market specialization and wealth resulted from *more* assets in the form of financial capital (stocked assets), human capital (labor and age), and natural capital (land, resources) (Coomes and Burt 2001; Coomes 2004; McSweeney 2004b).

Specifically in this case, market oriented, high income households (cluster 1) had low investment in boat and gear and were younger, comprised mostly of fishermen of reef fishes. Market oriented, low income, households had high investment in boat and gear and were the most diversified in terms of strategies extracting shrimp, bonito, and drum alternatively (cluster 3). Subsistence based, low income households (cluster 2) were older, had low investment in boat and gear, and had more household labor. However, the reason the findings of this case differs from terrestrial studies is the context. Fishery livelihoods are complex; resource users extract diverse and mobile species. Terrestrial studies focused on extraction of one resource, such as charcoal (Coomes and Burt 2001) chambira (Coomes 2004) or mixed forest product (McSweeney 2004b). This demonstrates the challenge in cross comparison of livelihood strategies under different livelihood contexts.

Nevertheless, in Cassurubá, extraction is expressed through space and time, and actions of shrimp and whales for households of cluster 3, and the new institutions conflict with these processes. Shrimp and drum fishermen are being displaced from the 500 meter zoning and those with less powerful boats will not be able to go as far out. Those that seasonally switch to shrimping, such as bonito fishermen, in winter because of humpback whales will be impacted from the zoning because the shrimp are in the near shore muddy waters during this period. And those shrimpers that switch to drum fishing during shrimp closures can no longer do so since drum fishing is prohibited during shrimp closures.

The livelihoods of the marginalized, low income households of the *zona ribeirinha* are most compromised by institutions of the Cassurubá RESEX. These households, with mean incomes lower than the Brazil minimum wage for individuals, sell only 45% of their fisheries catch. They are currently unable to farm for subsistence, as they have for many generations, and many former farmers have turned to fisheries but will be limited to near-shore zones with their small vessels. With low educational levels, alternative incomes to fisheries or farming are hardly an option, particularly in regard to the Ministry of Fishing and Aquaculture law mentioned earlier. More ironically, *moradores* will continue to pay the rural land tax (Imposto sobre a Propriedade Territorial Rural, ITR) despite not being able to farm.

This finding that low income household livelihoods are highly compromised, the most ironic outcomes of the Cassurubá case, resonates with scholarly work that argues conservation agendas have unintended impacts on livelihoods (Neumann 2004; Brockington and Igoe 2006; Zimmerer 2006b; Zimmerer 2006a; Lele et al. 2010; Robbins 2012). As mentioned earlier, the RESEX institution states that resource users are to elaborate rules of use. Despite this fact, RESEX authorities have imposed informal rules of use, and few representatives of resource users have contributed to formal institutions that are at odds with Cassurubá RESEX resource user livelihood strategies. Although resource user representatives comprise 50% +1 seats of the Cassurubá RESEX deliberative council, there is poor representation of resource users. Most do not regularly attend meetings (91% in this study) as explained in Chapter III, and without political knowledge they are overpowered by RESEX authorities. Only eleven active fishermen

were involved in creation of the fishery agreement (Nobre and Schiavetti 2013), impacting hundreds to thousands of other resource users including *marisqueiras*. Formalized rules of use for the terrestrial area of the RESEX, in the form of a management plan, have not been created as of July 2014 and it is unclear whether or not farming practices will resume in the future. Notwithstanding, and in the short-term, livelihoods of marginalized resource users of the Cassurubá RESEX have been negatively impacted (as argued in Chapter III) and are being reconstituted as will be discussed in the next chapter.

4.3 Conclusion

Coastal-marine extractive reserves (RESEX) as a sustainable use conservation model are increasingly popular in Brazil and coastal regions of other developing countries. While RESEX establishment aims to protect resource user livelihoods in Brazil, the Cassurubá RESEX reveals diverse livelihood strategies that face unequal effects from new institutions for resource use. Where rules of use (both formal and informal) are to be elaborated by resource users, according to the RESEX model, Cassurubá RESEX authorities have established rules with disregard to livelihood strategies of certain users. The RESEX model and new institutions are unaligned with the livelihood practices and diversification strategies of resource users.

To reiterate, an analysis of household typologies based on household market orientation and income, household assets, and RESEX institutions demonstrated that the institutions of the Cassurubá RESEX will have differential impacts on resource user

households. The livelihoods of market-oriented low income households, and low income subsistence households (clusters 2 and 3) are negatively impacted by Cassurubá RESEX institutions because of loss of fishing grounds, conflict with extraction diversification strategies, and financial loss of material assets. The low income subsistence households (cluster 2) are further compromised by the imposition of informal rules regarding land use by RESEX authority. These resource users are politically and spatially marginalized with little ability to influence conservation planning; however, more well off resource users, as indicated by high market orientation and income levels (cluster 3), are unaffected by new RESEX rules. These findings supports the claim; conservation and development agendas need to consider the differential livelihood strategies of resource users or efforts will be undermined (McSweeney 2004b, 2004a; Carr and McCusker 2009; Coomes 2004). (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004b; Carr and McCusker 2009; Lansing 2009; Walker and Robinson 2009; Chowdhury 2010; King 2011).

The research suggests that to reach the goals of protecting resource user livelihoods and the resources they depend upon, RESEX authorities should (a) develop institutions and rules-of-use better aligned with the extraction strategies of resource users; (b) support food security and subsistence farming of resource users; and (c) focus on political-economic means to diversify income streams for resource users. As long as federal law prohibits resource users from obtaining alternative incomes in addition to fisheries, pressure on fisheries will not be reduced and livelihoods will not be improved, and conservation policy for fisheries in Brazil needs to consider this. Conflicts between

conservation policy and livelihoods reveal incongruities between the RESEX model and actual livelihood strategies in place, which may undermine political support necessary to sustain the RESEX. I conclude that livelihood strategies of resource users should inform design and implementation of new institutions to reach livelihood and sustainability goals of RESEX in Brazil and elsewhere. More studies are needed that investigate the livelihood strategies of RESEX resource users in order to gain a better understanding why the RESEX model may contradict with livelihoods in place so that the implementation and management of future RESEX result in more equitable outcomes.

CHAPTER V

INSTITUTIONALIZING EXTRACTIVE RESERVE BENEFICIARIES

In this chapter I problematize the notion of extractive reserve (RESEX) "beneficiary." I answer the questions: Who are RESEX beneficiaries? How and why are RESEX "beneficiaries" produced? How have resource-users contested, or adjusted to, the status of "beneficiary," or the RESEX in general? What are the social and political effects of establishment of the Cassurubá RESEX? I also examine the quasi-hypothesis that the institutions of RESEX are inconsistent with livelihood strategies of terrestrial and marine resource-users (Salisbury and Schmink 2007; Vadjunec, Schmink, and Gomes 2011). It appears obvious this claim should have been tested, and proven correct, in Chapter IV. However, the claim is tested here because the RESEX "beneficiary" is also a RESEX institution. This brings the dissertation full circle, from examination of the processes by which elites created the RESEX, to livelihood impacts, and now to the contested category of "beneficiary" that the RESEX created.

The questions above are answered using ethnographic methods and discourse analysis (Mels 2009); and the data presented here are derived from semi-structured interviews with key informants (n=20) and resource users (157), participant observation, and analysis of texts, as explained in Chapter II.

Chapter III showed that resource users of RESEX are termed "beneficiaries" who will obtain the benefits of participatory decision-making and empowerment, and gain access to the various government incentives (*Políticas Públicas*). But, the former

benefits related to RESEX governance, or decision-making, are hardly realized in practice. Here, I focus on the latter benefits of government incentives on a more normative note, yet explore the notion of "beneficiary" in detail to show how things are hardly as they appear (Robbins 2012).

I demonstrate that the discourse of "beneficiaries" is a disembodied abstraction while livelihoods are being reconstituted as resource user's relationship with the environment is changing, and they become artifacts of RESEX. The majority of resource users do not perceive themselves as "beneficiaries," but harmed by the RESEX, and they perceive NGOs as having benefitted the most. A few resource users have taken on the RESEX ideology to position themselves in power, contributing to decisions that inadvertently impact themselves and hundreds of other resource users, including women. I conclude that "beneficiaries" are an "imaginary collective subject" produced by government actors (institutions and officials) that renders the appropriation of land, and expansion of bureaucratic state power, invisible (Ferguson 1994, 280).

5.1 Results

5.1.1 Material livelihoods

5.1.1.1 Pre-RESEX livelihoods

As elaborated in Chapter II, the Cassurubá area has been established, extracted from, and farmed for centuries. Both men and women engaged in farming activities, fished in the tidal rivers, and extracted abundant shellfish, mollusks and crustaceans for generations; livelihood practices that still exist today. Also, the livelihood systems of the

zona ribeirinha and peri-urban areas have been linked for generations as *ribeirinhos* would sell and trade their product at the weekly Saturday market in the peri-urban centers, an existing practice today. In the mid twentieth century, however, the economy was thriving because of the extraction of timber and the Bahia Minas Railroad. Produce from the *zona ribeirinha* was sold to naval officers, of ships docked in the Caravelas River, and merchants of the Bahia-Minas railroad (Ralile 2006). Agricultural production was so great that "no one ever starved" and "produce was rotting on the ground" (OHCA0111, 06/20/11, OHCA1611, 07/05/11).

The exceptional abundance was also true for seafood but "the market for seafood was weak in the past" (MOCACA03, 08/27/2013) and only became prolific in the 1970's when a fishing cooperative was established in Caravelas. Shrimping was the main fishery in the area, as it still is today, and shrimp was exported to larger cities. The shrimp landings were so great that much of it could not be kept and excess was "thrown overboard into the river" (OHCA0111, 06/20/11). Nova Viçosa was also a depot for shrimp, and its waste. Shrimp was piled high in warehouses waiting for pickup by trucks. "When it rained the trucks could not access here. The roads were dirt, so when it rained, it was all mud, and the trucks could not pass. So they would throw tons of shrimp back in the river. There was so much shrimp it would fill this market to the roof, all gone back in the river" (PENVPO22, 12/11/2013).

Fish, mollusks and other crustaceans were also abundant. Many long-term *pescadores* and *marisqueiras* stated that their boats and canoes were heaping with fish and shellfish. There was so much abundance it would go to waste because you "could

not even sell a fish for R$1" (MACAPA0308142013, 08/14/2013). This lead *marisqueiras* to begin the practices of salt-curing, and sun-drying, fish and shrimp which was especially important at the time since there was no refrigeration. The practice still exists today, mainly with shrimp by-catch, for preservation purposes (see Figure 5.1). However, the salted fish is now considered a delicacy and heavily sought after by locals, and regional consumers from Salvador to the north. Fishery is the main economic activity of the area today comprised of livelihoods that have been rooted and gendered for generations.

Figure 5.1 Salted and sun dried fish and shrimp (Ponta de Areia, Caravelas, August 2013)

5.1.1.2 Gendered livelihoods, rooted identities

Resource user livelihoods of the Cassurubá RESEX are diversified and gendered, with men conducting the physically demanding fishing along the shore and open sea, and women conducting activities such as shellfish collection and cleaning. However,

livelihoods are synergistic and women play an active, and very important, role in fisheries and have for generations. The roles and identities of *pescadores* and *marisqueiras*, of the Cassurubá RESEX, are materially embedded from their social relationships and relationships with the environment, and have been for generations.

As explained in greater detail in Chapter III, the majority of men, as *pescadores*, fish shrimp and drum along the shore, bonito in the open sea, reef fishes along corals, and snook and catfish in the river. *Pescadores* of shrimp alternate to fishing drum during shrimp closures in April and November, and those who fish bonito alternate to shrimping from June to November, when humpback whales are present and pose a life risk. Many men also collect shellfish in the mangroves as *marisqueiros*. However, the majority of shellfish collectors are women (*marisqueiras*), and some fish in the river and along the shore in a *bateira*; a small rowboat, with or without a small motor attached. Yet, most *marisqueiras* of this type reside in, or have access to land, in the *zona ribeirinha* through parental decent. The bulk of *marisqueiras* residing in the urban centers do the work of cleaning shrimp caught by *pescadores* for the several fish markets in Caravelas and Nova Viçosa (Figure 5.2). This is the main source of income for women as their alternative is domestic work as a maid (*empregada*), working in small shops, or jobs with the municipality. As for the latter, most are unqualified with low educational levels, and the running mayor's constituents typically occupy clerical positions.

Figure 5.2 *Marisqueiras* cleaning shrimp at a fish market (Caravelas Centro, November 2013)

Shrimping and cleaning shrimp are demanding, dirty, and foul-smelling jobs for men and women. With shrimping being the main fishery in the area, and thousands of tons caught per year, it was inevitable that it became a woman's job. *Pescadores* already abuse their bodies by manually trawling shrimp; they embark between midnight and 3:00 am to avoid heat and sun exposure, and only return twelve to fourteen hours later to sell their catch to fish markets for R$2.50-4.00 kg. They have neither the time, nor energy, to work more than they already do. The *marisqueiras*, however, can begin work as soon as shrimp is landed and continue cleaning the catch the following day. Their work is also physically demanding as they stand at tables between 6:00 am and 6:00 pm, or until all the shrimp are cleaned, and they are paid R$1-$2.50 per kg cleaned.

Pescadores and *marisqueiras* do shrimp fishery work six days per week except during shrimp closures in April and November. They alternate to other means of extraction as mentioned above. It is no surprise that the main health issues they reported during this study and in a report (Curado 2009) are spine related.

Yet, *pescadores and marisqueiras* are happy with, and proud of, their work. Further, and contrary to one's perception of female labor exploitation in this case, *marisqueiras* do this work to support the men who are their husbands, sons, and other family members and extended kinship networks of their livelihood system. This is exemplified by one *marisqueira* who stated, "We *marisqueiras* only make money when *pescadores* make money. This is a family life. You support your family here. We all make the same amount of money in our family" (MANVPO05, 12/05/2013).

In addition to cleaning shrimp, *marisqueiras* clean the soft-shell crab (*siri*) and fish by-catch of their husbands, family members and other *pescadores*. This by-catch is kept, rather than discarded, and is sold for profit and consumed. Cleaning the soft-shell crab is tedious work because the crustaceans' appendages are small. Yet, the sweet flesh is highly valued and *marisqueiras* can sell it cleaned for R$15-18 per kg. The by-catch fish is salted and sun dried and sold for R$1-2 each. The *marisqueiras* keep the money they earn from these practices rather than deliver it to their husbands. Many save it to buy a *bateira* (small rowboat). There is also a moral economy extending beyond the household as one *pescador* stated of soft-shell crab by-catch, "*Siri* is important but not for income. I give it away to people, *marisqueiras*, who need it. We need to help each other here" (PEALPO03, 12/13/2013).

The role of *marisqueiras* and their relation to *pescadores* have been materially embedded in their livelihoods for generations, before there was a fishery market, and continues today. In fact, wives of *pescadores*, and women residing in the *zona ribeirinha* are considered *marisqueiras* by others, or identify themselves as one, even if they also farm. In regard to the former, *marisqueiras* either clean the shrimp and treat the by-catch of their husband or sons, or do this work at the fish market of a relative or kin. In regard to the latter, shellfish has been a main source of subsistence for *moradores* and most extract the resource, therefore, being a *marisqueira* is inevitable. Both men and women extract shellfish, crustaceans and mollusks from mangroves and the shore for subsistence and small profit. The point here is personified by the words of one *pescador* when asked how he identified himself: "I am a *pescador*. I was created from it. People live it. I have fished for 20 years. Who isn't a *pescador* or *marisqueira*? The Colonia de Pesca here has about 2000 members and the majority are *marisqueiras*" (PECAPA02, 07/11/2013). A *marisqueira* stated, "we are *marisqueiras* but our husbands are *pescadores.* I learned from my mother and father" (MONVBV04, 9/17/2013). Another stated, "I am *pescador.* I have been fishing for life. My mother and father are *pescadores.* All of the family is *pescadores* and *marisqueiras*" (PECAPA10, 10/21/2013).

As stated in Chapter III, over 90% (n=122) of resource users stated they learned their fishery skill from parents or other family members. Many also shared how they, among others, were born into their roles: "I am a *marisqueira.* I was born into this struggle" MACAPO01, 08/26/2013); "We are *marisqueiras.* I have been doing this since I was 12 years old. Today I am 31 years old. It is the only thing we have done our entire

lives" (MACACE04, 07/31/2013); "I am a *pescador*. I learned at eight years of age, fishing in the river. I learned from my parents. I was born and raised in *Perobas* [of the *zona ribeirinha*] and my parents are a *pescador* and *marisqueira.* They also used to work the farm in the past" (PENVPO07, 12/05/2013); "I am a *pescador*, because it is of the family, my grandfather, my father, we all fish. I would hide on the boat when I was a kid and they would find me once they were out at sea" (PECACE09, 07/23/2013); "I am a *pescador*. I was born fishing. I have fished since I was 7 years old" (PECAPA01, 07/10/2013): and "I have been a *marisqueira* since I was a girl. I used to fish soft-shell crab and collect clams in the *zona ribeirinha*. I learned from my parents. We live from this" (MACACE06, 08/3/201).

Resource user identities are also bound to the resources they extract. When discussing how they identify, many men and women referred to the resource as part of their being, as shown in previous quotes, and from the following statements by men: "I am a *marisqueiro*. It is what I live from" (MOCALA01, 07/6/2013); "I have lived from shrimp for thirty years" (PENVPO13, 12/09/2013); "I am a *pescador*, because I live from fishing. I have fished since I was 17" (PECACE20, 07/27/2013); "I am a *pescador* because we live from fishing" (PECACE01, 07/03/2013); "I am happy with shrimp. I survive from it!" (PECACE14, 7/25/2013); and "Everything I have is from fishing, even my health" (PECABC11, 11/18/2013). In essence resource user identities, and roles, have been constituted from their social relationships, and relationships with the resources they extract, or environment. This is not to suggest however that these

livelihoods are void of household labor relations of power. As one *marisqueira* stated "I did not choose it. It chose me. It called me" (MACAPA03, 08/14/2013).

Most women became *marisqueiras* because they were "born in it," as with the *pescadores*, or because they had to. Women engaged in livelihood activities of which they could easily watch their children and this included work close to home, such as collecting and cleaning shellfish, rather than going out to sea. As one *marisqueira* clarified, "I am a *marisqueira*. I learned as a child with my mother. I was cleaning shrimp at 6 years old. There was no daycare or baby sitters so kids helped their parents" (MANVPO03, 12/05/2013). Another stated, "I am a *marisqueira* with certainty. I learned as a child. I was about 10 years old when I started to clean shrimp. At the time we cleaned at home or the fish market. It was just to help my mother, so that I would not be alone without supervision" (MANVPO04, 12/5/2013). Figures 5.3 and 5.4 illustrate how children become engaged in fishery activities.

Figure 5.3 Daughters of *marisqueiras* cleaning shrimp at a fish market. Children were on school vacation and frequented the area where their parents worked (Nova Viçosa, December 2013).

Figure 5.4 Boys fishing with a *tarrafa*, an artisanal net, in the *zona ribeirinha* (September 2013).

What these quotes do not reflect, however, is that children were expected to work, to help the household, rather than attend school even if education was available. Families of previous generations tended to be large and required a good deal of labor for domestic chores, extracting shellfish, fishing, and farming. The words of one *pescador* reveal this household labor reality: "All my life I have been suffering for my family. I have 12 siblings. I had to work to help my parents" (MOCACA05, 09/16/2013). One *marisqueira*, still alive in 2013 at over 90 years of age, had 20 children all of whom are *pescadores*, *marisqueiras* and *lavradores* (PECACE07, 07/22/2013).

The hard labor of resource users is embedded over time in their physical bodies. A *marisqueira*'s role maintained her entire life is evident in the physical scars from her interactions with the resources. Hands and feet are scarred from cutting them on sharp oyster shells buried in mangrove mud; and fingers are discolored from the noxious shrimp excretion, and scarred from its spines (Figure 5.5). For example, one *marisqueira* said, "My mother was also a *marisqueira* but she stopped because of her fingers. Your fingers hurt and get scarred from cleaning the shrimp. Look at my hands, they are crippled" (MANVPO07, 12/10/2013). The *pescador*'s work is physically demanding, and debilitating. The work is revealed in their very tanned, or sunburned, muscular bodies, and wrinkled skin on their faces. The work of fishing has left many of them with spine problems as one of many complained, "The *pescador* at 60 [years of age] is dying, with back problems. I have spinal disk problems" (PECABC02, 10/02/2013).

Figure 5.5 The hands of a *marisqueira* while cleaning shrimp. Notice the discoloration of her fingers, from the noxious shrimp fluids, which is characteristic of senior *marisqueiras* (Nova Viçosa, December 2013).

Moradores' subsistence oriented life in the *zona ribeirinha* also assumed the role of *marisqueira*, or *marisqueiro*, and *pescador*. Yet these men and women also farmed because farming was a household activity that men, women and children engaged in. Those whose primary means of production was farming identify as *lavradores* who "work the land." Their bare and calloused feet with mud stained toes displays the physically demanding work of farming the land. As expressed by one *morador* "My hands were stained with red mud when I worked making stakes and I would wash my hands with salt because of the callous" (MOCACA05, 09/16/2013).

Nonetheless, having a large household supplied labor and gave a household more leverage, or power, in maintaining their property rights through both the male and female heads of household and their kin. However, their rights to land and livelihoods are being transformed with the RESEX, which does not distinguish these livelihood identities, and in the words of a one, "Our parents and grandparents worked with their sweat and blood, and hard work to give this to us, and we have no rights now! [because of the RESEX]" (MOCACA05, 09/16/2013).

5.1.2 (Re)working the land

> "We plant so that we do not have to buy food. People are now forced to buy food from Teixeira de Freitas full of chemicals" (MOCACA05, 09/16/2013).

The words above of a *morador*, and *pescador*, of the *zona ribeirinha* summarize the position that he, and all other residents residing in the terrestrial area of the RESEX, were in as of 2013. They had been "working" the land for generations, and the result of their work was literally inscribed on their bodies in ways that they were unashamed to show. Now, with the informal rules of use (the prohibition of clearing of fallow or burning for farming or pasture, and no planting without permission) imposed by the RESEX ICMBio official, or in his words, "If they want to plant they have to ask for authorization" (KACACE07, 07/04/2011), these resource users are in a difficult situation. The small-scale agricultural production was mainly for consumption but also for small profit in times of higher production. Moreover, by farming, *moradores* had a steady supply of produce in place rather than having to "buy it" as stated above from

markets in the peri-urban centers which are difficult to access because of the geographic isolation of the *zona ribeirinha*. The Cassurubá terrestrial area extends from Caravelas in the north to Nova Viçosa in the south, encompassing approximately 20 km. The only means of transportation to access the municipalities is by boat. Most residents of the *zona ribeirinha* have canoes or rowboats, and few have motorboats. From Caravelas to Nova Viçosa it takes 4 hours by motorboat. Anyone located in the center of the terrestrial area of the RESEX with a motorboat would require a two-hour trip. This is even longer by rowboat or canoe. Moreover, how can they store produce with no refrigeration? Recall, from Chapter II, homes in the *zona ribeirinha* are solar powered without capacity to power large appliances. The prohibition of farming in the *zona ribeirinha* is clearly antagonistic to its socio-economic situation. Nonetheless, *moradores* farmed out of necessity. But they also farmed as a material way of life and a choice they made for several reasons.

First, they manipulated the land to establish possession rights, in accordance with land access strategies used elsewhere in Brazil (Brannstrom 2001). Any land that was not inhabited or "worked" could easily be appropriated by local government, or anyone else who laid claim to it. Even after the RESEX was established, and despite the new land-use rules, resource users still attempted to maintain claims to their land that they had "abandoned." For example, one *pescador* from Caravelas with land in the *zona ribeirinha,* and no longer farms stated, "I only keep cattle there, to keep things going there, so the place won't be abandoned" (PECACE26, 07/31/2013). Another means to demarcating one's land was to plant coconut trees, and all "properties" within the

RESEX have them. Coconut trees have a dual purpose: they are a symbol of inhabited or owned land and they provide the much needed nutritious water in areas where freshwater is inaccessible.

Second, land was a resource to be worked that could produce and provide subsistence for *moradores*. Any land that was not manipulated by humans was considered "dirty." The actual act of burning or clearing is referred to as "cleaning" (*limpar*), or *roçar*, the act of clearing for planting of crops or creating a small farm (*roça*). Whether done for access, pasture, or farming, "cleaning" the land was a virtue. This is not to suggest that *moradores* were deforesting large areas. On the contrary, they reserved large patches of forest as habitat for small mammals they hunted. The quote of one *pescador*, with land in the *zona ribeirinha*, exemplifies this point and displays the relationship of these resource users with their environment: "This area in Cassurubá was already a natural reserve. People made little farms. They cut 200 square meters to make *roça*. But the forested area is not touched. It is untouchable. That is for the animals and when I feel like eating an animal I go in there and get one. This is how my grandparents and ancestors preserved the area. And when they cleared forest they killed one or two [animals] a year and would then return and clear the same area. It would be a *roça*. It was the management plan of theirs. It is knowledge, human knowledge" (KACACE10, 07/12/2011). Resource users also knew very well that intact forest had a cooling effect and helped maintain water in the soils. Further, most farms visited consisted of mixed agro-forestry, a practice well established before contemporary sustainability agendas. For example, these small nonlinear areas consisted of several corn stalks intermingled

with a few banana trees and squashes. Only two farms consisted of monoculture plots (50m x 50m of squash and 25m x 25m of pineapple) of agriculture.

Third, resource users who conducted small-scale farming activities considered it a way of life and a life they chose. They chose the rural life over life in the peri-urban centers of Caravelas and Nova Viçosa. Many stated that it was peaceful living in the *zona ribeirinha*, the air was fresh and the quality of life was better. Barefoot and all, this was their essence and way of life. For example, one *morador* stated, "The climate here is beautiful, I am happy" (MOCAAT01, 09/04/2013). Another asserted, "I am a *lavrador,* I was born and raised from it and learned from my parents. I like the *roça* very much and I like being a farmer" (MOCACU04, 09/25/2013). A retired *lavrador* also shared his contentment: "I am very happy. I do not imagine anything different. My main activity of my life was farming, when I was strong. I have been farming since I was ten years old, with my parents. Everyone, my parents, all my siblings, we were farming, catching shellfish and fishing. This was our life" (MOCALA03, 12/04/2013). This way of life however, is being interrupted by new rules of the RESEX, rules that resource users defy because "it hurts people with the land. It harmed a lot of people" (PECACE07, 7/22/2013).

Resource users, including non-residents of the *zona ribeirinha* strongly contested the new land-use rules. Chapter IV mentioned that 55% of resource users (n=122) either have access to land in the *zona ribeirinha*, or family member that does, and 33% were born in the *zona ribeirinha*. Resource users made many complaints regarding the inability to "clear forest" (n=37), "plant" (n=25) or "work" (n=19). More specifically, a

morador complained, "The business of the RESEX has stopped [us]. We are stopped. We can't cut. You can't cut to make a *roça.* But the *roça* is only for consumption, beans, manioc, banana" (MOCALA03, 12/04/2013). A *pescador* stated, "I had land there but now you can't have property and it [the RESEX] keeps us from working over there. That land was our grandparents' and now they prohibit you from living and working. What are we going to survive off of? People work today to eat tomorrow. Most people over there left because they can't work anymore. You can't cut a tree. You can't cut a tree to build a fence" (PECACE01, 07/03/2013). A *marisqueira* residing in the *zona ribeirinha* contested, "All the product is for consumption and we cannot do anything anymore. We can't put *roça*. Since we cannot work anymore the government should pay us. If I could live off of, or get money for the land to live somewhere else, I would. I would leave this place" (MACAPO01, 08/23/2013). A *lavrador* expressed, "I found it wrong because people born and raised there can't work anymore. They became accustomed to this life, they do not like commerce. It would be terrible to have to leave everything and do nothing" (MOCACU04, 09/25/2013). Another *marisqueira* protested, "You have to buy *farinha* from some market because you can't plant anymore. Every year you have to pay taxes [for your land] but you can't plant. *The rich can deforest, but the poor can't!*" (MACACE06, 08/03/2013, emphasis added).

These statements of resource users clearly demonstrate the impact the new land-use rules have on their material way of life and being. Moreover, they show how resource users will have a new relationship with the land, one in which they "cannot do anything" but watch forest regrow and get mediocre compensation from the Bolsa Verde

program. Each household is to receive R$300 every 3 months (see Chapter III), an amount that hardly meets the value of the land, and the livelihoods they previously maintained. One *lavrador* complained, "The land is not yours anymore, you can't sell it. The government should pay us for it. They should have purchased it from us. My entire *sitio* [farm] is worth maybe R$50,000" (MOCACA01, 08/23/2013). Another *lavrador* who raises cattle contended, "If they prohibit my cattle, then the government would have to give me money, compensate, for my land, and I would buy land somewhere else to work" (MOCAPO02, 09/19/2013). This *lavrador* has well over R$150,000 invested in cattle on his over 285 hectares (951 acres) of land that once belonged to his great grandparents. He continues the livestock raising practice of his deceased parents with great pleasure and pride as he stated, "I am more than good. I have no complaints. I am happy with the cattle. When I go out there and call them they come. I guess you could say I am a shepherd" (MOCAPO02, 09/19/2013). He also does not consider his practice destructive to the land, as only 20% of his total land is pasture and a great deal intact forest. He declared, "I protect the environment. I do not cut trees. I take fallen wood. You saw my land."

Further, livestock are more substantive than may seem superficially. As in many other places in Latin America, cattle are a secure investment, such as the case for resource users who maintain fewer heads. One rancher said, "I sell [cattle] only once in a while, when it is necessary, when we need it, when we need medicine, when we need to buy something, to change the breed. It is not a lot of profit because of the costs, the costs are more than the profit but it is enough to live. It is not to become rich. Having cattle is

like a reserve, like the bank. People put money in the bank and I have cattle. The cattle are an investment" (MOCAPO02, 09/19/2013). Another said, "We butcher in times of need. Cattle are more of a security, an investment for emergency" (MOCAMA02, 08/21/2013). Finally, another stated, "I buy my meat for consumption, but when I have a cattle butchered I keep half of the meat. I kill them out of necessity, when the southern wind arrives, for everyone, the family heirs to eat" (MOCALA03, 12/04/2013). The southern wind arrives during the winter months and prevents *pescadores* from fishing because of the danger it imposes. Therefore, resource users residing in the *zona ribeirinha* need an alternative to fish protein during winter months. Figure 5.6 shows a pasture in the *zona ribeirinha*.

Figure 5.6 A cattle owner and his apprentice approaching cattle. This is on his pasture in the *zona ribeirinha* of Caravelas (September 2013).

Although formal rules regarding the raising of livestock are yet to be established, rumors spread in the area in 2013 that there would be restrictions on the number of head of cattle, or cattle would be prohibited from the RESEX. ICMBio officials did state, on various occasions, that raising cattle should not be an activity in RESEX because it is not a "traditional" practice. Further, with the 2013 prohibition on creating pasture, cattle grazing will likely diminish in the long-term. In short, the existence of the RESEX, with new rules and meager compensation for restricted land-use practices, hardly benefits resource users whose livelihoods have been materially embedded with their environment for generations. This raises the issue of who is a RESEX "beneficiary"?

5.1.3 Who is a RESEX "beneficiary"?

When asked, "Are you a beneficiary of the RESEX," a *morador* replied, "No, I am not a beneficiary because I am not benefitting. It is not benefitting anyone here" (MOCACA04, 09/16/2013). This statement is aligned with resource users' perceptions of the new land-use rules, displayed above, and the RESEX in general. It was a typical response when resource users were asked if they were a "beneficiary." Other negative responses included; "No. I never received any benefit" (MANVPO02, 12/03/2013); "I do not understand it. They had a meeting in Tapera and I do not understand anything" (MOCACA01, 08/23/2013); "Not for me. I have not even gotten a book of matches yet. All I have seen them do is waste a lot of gas passing up river in the speedboat" (MOCACA05, 09/16/2013); and "Not yet. They tell us we are beneficiaries but we have

not seen anything yet. Everything has to be through an association to get things. We need support" (MOCACA02, 08/27/2013).

Those who replied they *were* beneficiaries stated it was because they were a *pescador*, *marisqueira*, an heir of land, or were waiting for the "benefits" of the Bolsa Verde Program or Rural Housing improvement program (PNHR). More generally, 52% said "no," 30% said "yes," 8% said "I do not know" and 10% said "not yet" (Table 4.1). The mixed responses of resource users, as identifying as a "beneficiary," demonstrates the schism of RESEX "beneficiary." To resource users, a "beneficiary" is ontologically one who benefits, and thus far, most fail to see any benefit derived from the RESEX because of restrictions on resource use, and history of empty promises.

"There are so many promises and we have not seen anything" (PECACE18, 07/26/2013), stated one *pescador* of many resource users who complained "they promise so much and nothing happens" (MOCACA01, 08/23/2013). These complaints of empty promises include: "The governor of Bahia promised that that price of gas would cost half the price for people who fish. It never happened" (PECACE1911, 07/07/2011); "There is nothing, nothing, nothing. Promises, there are a lot; houses for the *marisqueira*, houses for the *pescador*, boats for the *pescador*. There are only promises and nothing happens" (PECACE0711, 06/22/2011); "They kept talking about projects that were going to happen that would improve our lives, but nothing has happened. I have not seen a thing happen" (PECACE01, 07/03/2013); "They said there would be loans to help buy things, boats. Nothing came" (PENVPO15, 12/09/2013); "Fibria promised us radios for our boats, so many things, and nothing has come yet" (PENVPO16, 12/09/2013), and finally

"I do not go to meetings because I hear the same shit and promises!" (PECACE16, 07/25/2013)

Government and Fibria officials have been promising resource users many things for years, but these have yet to be realized, causing great skepticism of RESEX "benefits" to be received by resource users. Not surprisingly, resource users are not blinded by the notion of "beneficiary" as several were well aware of the environmental mitigation funds allocated from Fibria by NGOs such as IBJ and Ecomar. For example, one *marisqueira* declared of NGOs, "They make projects, and they eat the money, and it falls outside [of us]. Here there is Fibria, Petrobras, and these businesses make a lot of money and we do not see any of it" (MACACE2111, 07/07/11). A *pescador* stated, "Nothing has come. NGOs are just eating the money. For us little people there is nothing" (PENVPO14, 12/9/2013). More articulately, a *pescador* stated, "The government couldn't do it so they got partners, NGOs, to do the work. They are all over the place now and they make a lot of money. I see so many projects, they get all this money for these projects and then nothing happens from them. Those people are getting paid well to work on these projects but we do not see anything different" (PECACE1911, 07/07/2011). More interesting is one *pescador's* perplexed perception of NGO involvement with the RESEX. He asked, "They can't have these little meetings here, this little group of them, without money coming from the government, or maybe from outside. No one does anything for free. Tell me something, do these NGOs get money to do this?" (PECACE11, 07/23/2013). This *pescador* also asked what benefits he would derive from agreeing to the interview, as another had asserted, "They [NGOs]

win, we do not. What will your work do for us? What do we *pescadores* see?" (PECACE29, 09/03/2013). More polemic was a *pescador's* declaration after an interview:

> "If this interview was for an NGO, I would not give the interview. NGOs do not help with anything. They do not give lectures to tell us what's happening. They do not teach us what's best for the environment. They just want to receive money. ICMBio is only to bring the federal government to the *pescadores*. The RESEX meetings are between them. They do not put a car on the street to announce anything. NGOs do not talk about the projects they do. This is the city of NGOs. Alcobaça, Nova Viçosa, Prado, they do not have NGOs like here. Caravelas has more NGOs than anywhere. They want to increase the area of the Abrolhos Park. Where will we fish? Petrobras wants to go there and will be out there, so the Park will be expanded towards here" (PECACE19, 07/26/2013).

The majority of resource users perceive locally situated NGOs, rather than themselves, as deriving the most benefits from the RESEX and their other conservation initiatives in the area.

5.1.4 RESEX and "beneficiary" ideologies

The benefits gained by NGOs are perhaps why some resource users have incorporated the language and ideology of the RESEX, and conservation, to secure their interests and situate themselves in positions of power flow. While the majority of resource users are opposed to NGOs, and even consider NGOs to be government

(Nicolau 2006), some individuals have taken on the "environmentalist" and RESEX mentality. For example, one resource user when expressing concern over clearing that had occurred in the RESEX stated, "They deforested [in Cassurubá] and I got discouraged. It is opposed to ecotourism. We want this place to look nice and intact, not deforested. It was a neighbor of mine who had cleared forest for his cattle" (KACACA13, 06/28/2013). When asked if a large area was cleared, he replied, "No, it is small scale production. But he is an extractivist and he should not break the rules. It opposes the idea of a RESEX." Another example is a former *pescador* who has been employed by local government (ICMBio and CEPENE) and NGOs, and acts as intermediary between government and resource user to "soften" any conflict. When asked about the subject of RESEX benefits, his answer could not have been more glorified: "There are many benefits that can come like the houses that will come. The second benefit is guarantee of territory. The third benefit is to create the management plan. It is participatory so it will have to sustain and benefit the resource users. It is a good model. Like Chico Mendes, he is like the Jesus of the RESEX. He died to give us the RESEX" (KACACE16, 11/08/2013).

In addition to becoming environmentalized by having worked for the Humpback Whale Institute (*Instituto Baleia Jubarte, IBJ*), this individual was introduced to RESEX through CEPENE, ICMBio, and NGO officials as they had funded him to visit other RESEX to become familiar with them. They also funded him to visit shrimp farms in northeastern Brazil to become familiar with the damages of shrimp aquaculture. He became the means for coercing other resource users to buy into the RESEX idea and

oppose the Coopex shrimp aquaculture project discussed in Chapter III. The previous individual became environmentalized through an ecotourism training program administered by Ecomar in 2010. Nine resource users went through the one year training program in which they were educated of RESEX and ecotourism, and trained as trail guides and cooks, for potential tourism within the terrestrial area of the RESEX. Trails had been established in two areas of the RESEX where visitors could gaze at the landscape and "traditional" livelihood practices of *ribeirinhos*, such as manual manioc flour (*farinha*) production, and eat local cuisine. These individuals also played a role in forming the Mother Association (Associação Mãe) so that RESEX funds, derived from Fibria, could be allocated to create small projects, as other resource users have done as a response to RESEX creation. The Shell-fisher Association of Ponte de Areia and Caravelas (Associação de Marisqueiros de Ponta de Areia e Caravelas, AMPAC) and Fishermens Association of Caravelas (Associação de Pescadores de Caravelas, APESCA) were also created as a result of the RESEX as explained in Chapter III . ICMBio and NGO officials told resource users to develop associations to better access RESEX power and economic incentives. Therefore these associations are slowly being formed and led by "elites" who have the education and means to do so.

More significant is the fact that very few individuals, such as these, are seated on the RESEX deliberative council, and were involved in making the new fishery agreement in 2013 (explained in Chapter IV), along with government officials and NGOs. In fact, only eleven active fishermen were present when the fishery agreement was created (Nobre and Schiavetti 2013). Therefore, few resource users who absorbed

"environmentalist" and RESEX ideology contributed to fishery institution building that has effects on thousands of resource users. Ironically, the fishermen who participated in the agreement contested some of the rules only three months later and wanted them rescinded (Nobre and Schiavetti 2013). In turn, the fishery agreement process through the deliberative council is being passed off as having met the "the principal of good governance" (Nobre and Schiavetti 2013) elaborated by renowned Eleanor Ostrom.

A means for "environmentalizing" resource users is through communication and education projects of ICMBio and NGOs, enabled by Fibria funds, which aim to communicate what the RESEX is and educate resource users. Fibria allocates $200,000 per year to education and communication projects (pers. com. with ICMBio employee). The educational program is replete with awkward cartoon characters (Figure 5.7) that represent resource users, yet are RESEX animals. The characters are presented at RESEX meetings as cardboard stand-ups and posters. ICMBio and NGOs have created two educational booklets thus far containing the characters, one for education of the RESEX and the other of the importance of the dredging of the Canal do Tomba, discussed in Chapter II. The text of the booklets are derogatory as they emphasize the low education of resource users with text such as; "I studied until 2nd grade and I am a proud fisherman" in reference to Martin *pescador* (page 1); and "Tell me now why we are here and what we have to do to create this REZECK" (page 6). Or in exact words: "*Diz logo prá que "tamo" aqui e o que "temo" que fazer para criar essa REZECK.*" (Un)fortunately, a large majority of RESEX resource users are illiterate.

Figure 5.7 Characters used in RESEX communication and education programs. The characters represent both resource users and resources of the RESEX. Images of the cartoons are extracted from *Martin Pescador em Semhores do Conselho*, 2012, available at: http://www.icmbio.gov.br/portal/comunicacao/noticias/4-geral/3159-resex-cassuruba-lanca-cartilha-e-mapa-ilustrativo.html.

Returning to the question "who is a beneficiary," when government and NGO actors were asked, who are beneficiaries, many appeared just as perplexed as the resource users. Yet, most answers were general and technical. For example, in 2011 an NGO official said:

> "I do know that some people who are beneficiaries depend on the area and live there, and people who do not live there but use the area. If a family uses the area to survive they are a beneficiary. They do not have to live there to be a beneficiary. Now, they are beginning a registration process of the people who are beneficiaries. With this there is always going to be some conflict because the area of the RESEX is not only for people who live there. They are still beginning the registration process to determine who the beneficiaries are, who lives there and who doesn't live there but uses the area" (KACACE04, 06/27/2011).

An ICMBio official stated, "In reality, the central objective of the RESEX is to guarantee this unit to the families that live there. And so there is a group of beneficiaries, and this group of beneficiaries is who should define the norms and rules and how this unit will be" (KACACE05, 06/28/2011). The ability of resource users to define norms and rules is extremely low, as demonstrated in Chapter IV and expressed earlier. However, recall that "beneficiaries" are to receive government incentives, as expressed by an ICMBio official, "There are some policies for this. Being part of an extractive reserve, they are beneficiaries of INCRA and they have rights to lines of credit; credit to improve homes, for fishing equipment, work material, for improving conditions in

general. They do not have this yet because it is still a working story for us" (KACACE07, 07/04/2011).

"Beneficiaries" certainly are "a working story." In 2013, a Normative Instruction (No 35, 27 December), with "guidelines and administrative procedures for the preparation and ratification of the listing of the beneficiary family in RESEX," defined "tradition populations" to be "beneficiaries" as "populations that are culturally different and recognize themselves as such, who extract renewable natural resources as means of physical and social reproduction essential to their way of life, under forms sustainable to the environment, guaranteeing the conservation of ecosystems with their own forms of social organization." The "beneficiary family" is defined as "a family composed of traditional population that meets the criteria of the definition of the profile of beneficiary family of the conservation unit, recognized by the community and by the management plan with rights to the territory of the conservation unit, and access to its natural resources and public policies for these territories." The guidelines state that the procedure for creating the profile of the "beneficiary family" is directed by the RESEX manager, but resource users are to take part in the process and approve the final "profile." The process entails conducting a household survey and obtaining three identity documents, Federal Identification (RG), taxpayer identification number (CPF) and Social Benefits. Once identified and registered, "beneficiary" families are "ratified" as an artifact of RESEX. ICMBio had plans to conduct the "profile of beneficiary family" in 2013, because less than half (668) of the resource user households of the Cassurubá RESEX had previously registered themselves, and the registry did not begin until July

2014. Resource users were reluctant to register because they were afraid to lose their rights or questioned why it was necessary. They were difficult to coerce into becoming "beneficiaries" and fulfill the mandate of the RESEX model.

Further, the tension between those residing within the Cassurubá RESEX and those outside had not been resolved. One key actor stated, "In truth we are doing a filtering of the profile of the extractivist. In my vision the beneficiary is all those who live from the resources of the area, all those who directly use resource for their livelihoods. Indirect beneficiaries are those who live outside the RESEX such as *pescadores*. The politics favor the people living in the RESEX and not those living outside of it" (KACACE16, 11/08/2013). Technically speaking, and as displayed in this quote, it is clear that not all resource users will derive the same benefits of the RESEX. Resource users were well aware of this and suspected the motives for promise of improvements for many technical reasons also.

5.1.5 Technical issues of RESEX "benefits" and "beneficiaries"

There are many technical difficulties in obtaining the benefits of the *Políticas Públicas*. First, the benefits potentially available to *moradores* of the RESEX were not available to those residing outside of it, such as *pescadores* and *marisqueiras* residing in the urban area. For example, the Bolsa Verde Program is for those who will leave forest and fallow intact for reforestation. Therefore, in peri-urban areas this benefit is meaningless. Also, the PNHR program is aimed for the most needy households that tend to be located within the *zona ribeirinha*. Therefore, this benefit is also not available for

those living in the peri-urban areas where homes are made of concrete and they have potable water and basic sanitation. Notwithstanding, in 2013, fifty households within the *zona ribeirinha* were surveyed (not a formal registry) by Associação Mãe for the PNHR program and "promised" they would have new homes built. Ironically, constructions or improvements within the Cassurubá RESEX are prohibited without the RESEX manager's approval and licensed by IBAMA. Construction of 50 new homes is highly unlikely. Other programs provide support to agriculturists such as access to low credit for work materials and machinery. However, only formal associations registered with the National Registry of Legal Entities (CNPG) can access the programs and it is a costly (over R$1,000), bureaucratic process to register. Moreover, in the case of Cassurubá, agricultural options are void with the new land-use rules. As one *morador* stated, "our association just received a brand new tractor and we can't use it because they [ICMBio] tell us we can't farm!" (KACACE12, 07/15/2011).

Second, and more ironically, is the fact that most benefits of the *Políticas Públicas*, are available, and have been, to all small-scale agricultural producers in Brazil and not just RESEX "beneficiaries." The same is the case for fisheries. A program for low-credit loans for purchasing boats and fishing gear through the Bank of the Northeast (*Banco do Nordeste*) has been available for many years. Several *pescadores* of the Cassurubá RESEX were able to purchase boats because of this program, which they said was really helpful because they would not have been able to purchase one without it. What ICMBio officials, and NGOs, are doing is presenting the benefits as a result of RESEX, making it appear as if these benefits were never available before, or are

unavailable, if the RESEX did not exist. This induces a point of reflection: what would a RESEX be if "beneficiaries" did not exist?

Figuratively speaking, a RESEX encompassing terrestrial areas becomes any other conservation unit, or protected area, that happens to have people living in it. And as with any other protected area with inhabitants, there are rules of use because the area is government territory. In more concrete terms, this is exactly the case for the Cassurubá RESEX because new rules of use have been imposed for both land-use and fisheries, as discussed earlier. More provocatively, an ICMBio official professed: "Before it was a reserve there were already these laws. It is just that now, with the reserve, maybe it will facilitate them being legalized, because contact with them is easier and so they are legalized easier than before" (KACACE07, 07/04/2011). This is exactly the case. Through the RESEX, resource user activities will be "legalized" once they become "beneficiaries" according to the Normative Instruction No 35, 27 December (ICMBio 2013a).

5.2 Discussion

5.2.1 Abstract and material livelihoods

The results demonstrate that "beneficiaries" are an "imaginary collective subject," devoid of individual identities and interests, produced (by government actors, including situated subjects and RESEX institutions) that renders the appropriation of land and expansion of bureaucratic state power invisible (Ferguson 1994, 280). In other words, RESEX resource users are not "beneficiaries" but rather subjects of government

that are to be accounted for and controlled, as displayed by the words of an ICMBio official earlier: *"Contact with them is easier and so they are legalized easier than before;"* and as argued in Chapter III. Like Ferguson's case in Lesotho, the results show that the resource users of the Cassurubá RESEX "do not all share the same interests or the same circumstances, and they do not act as a single unit" (1994, 280). By constructing "beneficiaries" and promising benefits and livelihood improvement, government actors can proceed with appropriation of land and resources under the guise that it is protecting and improving the lives of "beneficiaries." This is accomplished because "individuals are the vehicles of power, not its points of application" (Foucault 1980, 98), the application is the discourse, and in this case the discourse is of "beneficiaries." In this sense, "beneficiaries" are an abstraction of resource users, yet materialized through institutions.

The simplest way to explain this point is to remove the subject of "beneficiaries" from RESEX, or pry apart its discourse from practice (Thayer 2000). The result is then a protected area, or reserve, in which new institutions "curtail access to resources" (Neumann 2004; Larson and Soto 2008). Rather than physically displace resource users, which is ethically and politically dubious because of the history of conservation evictions (Brockington and Igoe 2006; West, Igoe, and Brockington 2006; Dowie 2009; Robbins 2012), there is "economic displacement through restrictions on resource use" (Lele et al. 2010, 2). However, this diagnosis seems benign because land has been appropriated and is under ownership of the state, and as expressed by a *pescador* earlier: *"ICMBio is only to bring the federal government to the pescadores."* Moreover,

"beneficiaries" cannot be removed from the RESEX recipe and livelihoods are being more than disabled. Resource users are being reconstituted as environmental subjects, and transformed into RESEX artifacts. In other words, "protected areas are the material and discursive means by which conservation and development discourses, practices, and institutions remake the world" (West et al. 2006).

As Harvey (1996, 197) quotes Marx's thesis, "when we transform nature we transform ourselves" and our social relationships. One's relationship with "nature," or the biophysical environment, induces self-realization, which is evident with the identities of resource users of the Cassurubá RESEX. The livelihoods, and identities, of resource users have been materially embedded for generations, constituted by the roles, and embodiment of resource users: *marisqueiras* who collect shellfish and clean shrimp; the *pescadores* who fish in aquatic spaces, and *lavradores* who farm, or "work," the land.

To deem these humans as a group of "beneficiaries" necessarily disembodies them. Many resource users stated that "they lived from this," and by "this*;"* the resource they extract or land they worked, or the interaction with the resource. A *marisqueira* is culturally "born into" her role and identity constituted from the first moment she goes into the mangrove to catch a tricky blue land crab, or cleans shrimp beside her mother as a child. Her role is maintained her entire life and the physical scars are evidence of her intercourse with the resource. A *pescador* is also "born into" his roles as he began to fish, as a child, with line in the river, or as castaway on his father's boat. Many of these people are also *moradores* of the *zona ribeirinha* living subsistence oriented lives also as *lavradores* who "work the land."

Their identities are constituted from the place they live, social relations, and interaction with the environment, as is the case with rubber tappers in the Brazilian Amazon (Vadjunec, Schmink, and Gomes 2011). Even rubber-tappers who no longer tap rubber consider themselves to be rubber-tappers. However, the RESEX emerged from rubber-tappers' struggle and the RESEX was institutionalized because of rubber-tapper livelihoods. In this case "beneficiaries" are emerging from the RESEX and the RESEX instrument is institutionalizing livelihoods. This fact exhibits the contradiction in what RESEX are institutionalized to be and what they are doing over twenty years later. Notwithstanding, considering how Cassurubá livelihoods are deeply embedded (mentally and physically) from social relations and their interaction with the environment, to deem them "beneficiaries" when their land has been appropriated, and divorced from their means of production, only adds insult to injury of their status as small-scale producers.

Chapter IV demonstrated that the most marginalized, subsistence based, fishery households residing in the *zona ribeirinha* are the most compromised by the new fishery institutions of the RESEX. Specifically, the law which prohibits fishing within 500 meters from the shore will affect those who fish with small, motorized boats and shrimpers. This law has a knock-on effect; if the *pescadores* cannot catch shrimp, the *marisqueiras* have no work. As expressed earlier by one *marisqueira*, who refers to their livelihoods as family life, *"we do not make money if the pescadores do not."* The law fractures the meshed livelihoods of these households. It also harms the moral economy by affecting people in need; those that *pescadores* give their soft-shell crab and fish by-

catch. More ironic is how only eleven active *pescadores* were involved in establishing the fishery agreement which will have an impact on thousands of people, including *marisqueiras*. Meanwhile the RESEX is being publicized as having met the "principle of good governance" (Nobre and Schiavetti 2013) albeit not representing half of its constituents, being female. Most resource users do not attend meetings because they have to work to sustain themselves (Chapter III). For *marisqueiras*, they work, *and* attend to their children, making it even more challenging to attend and participate in decision-making as was the case in Di Commo's (2007) study of the Corumbau RESEX. This is a component of the "anti-politics" of the RESEX, the agenda is set, and the debate and its context are controlled (Ferguson 1994; Li 2007a: 2007b); deliberative council meetings are physically and socio-economically inaccessible to resource users, especially women. It appears that "protecting" and "improving" livelihoods is opposite of what is happening in the case of the Cassurubá RESEX.

Most of the promised benefits of the *Políticas Públic*as, which exist *in absence* of RESEX, are available only to *moradores* of the *zona ribeirinha*. Yet, the benefits are null and void with the newly imposed rules for land-use. How can anyone access government incentives for small-scale farmers when no one is permitted to farm? We may have to wait years, perhaps more than a decade, to see if fifty new homes are built in the *zona ribeirinha*. Simply put, bureaucratic IBAMA licensing for improvements is slower than snails. The only so called "benefit" that has manifested is the Bolsa Verde Program, one of which *moradores* must not cut trees, or clear fallow, and allow reforestation, a stipulation of the "green" program or the benefit will be rescinded. The

R$300 every three months, *per household*, hardly meets the value of the land that resource users once possessed, nor the value of their rooted livelihoods, or their ability to "work" as they expressed. In other words, land was not "an exchangeable and interchangeable commodity, but as the ground where body, home, community, and habitat joined in everyday experience as well as in history" (Rocheleau and Ross 2005).

With land appropriated for conservation, and divorced from their means of production, resource users become conservation artifacts, and their land a conservation commodity. As West et al. (2006, 257) argue, they are part of a conservation agenda "that needs biodiversity or nature to become commodities and natives to become labor." Unable to farm for subsistence, they must now depend on external markets to acquire produce, which can be purchased with the Bolsa Verde money they receive for doing the job of allowing vegetation regrowth. The Bolsa Verde program contributes to one of the major Brazilian environmental asset exchanges (IETA 2014). Also, their transformed labor meets the needs of conservation initiatives for the RESEX. As an environmentalized resource user expressed, intact forest is better for ecotourism and clearing goes against the idea RESEX.

Ecomar has been conducting ecotourism projects for the RESEX in the *zona ribeirinha.* "Eco-trails" have been established for tourists to gaze at and consume the biodiversity and culture of the area. Resource user' "traditional" livelihoods are then observed and consumed as artifacts of the RESEX. Resource users "may also become commodities, as their culture becomes part of the selling point for people-centered conservation initiatives or ecotourism marketing" (West, Igoe, and Brockington 2006,

257). The commodification of land and labor for conservation is possibly the case for Cassurubá considering the indirect contribution of reforestation to carbon mitigation economies, and the eco-tourism. The RESEX also provides ecosystem services, as publicized on a CI website, "The creation of the Cassurubá Marine Extractive Reserve also means that around 20,000 fishermen who depend on these marine species will benefit from the environmental services offered by the new reserve" (CI 2009). In neoliberal conservation terms Cassurubá RESEX processes are an example of "the reconstitution of the relationships between people and between people and 'nature' according to the market" and decreases "the options available for rural people to determine their own resource-based livelihoods" (Büscher and Dressler 2012, 369).

5.2.2 Ontological status of "beneficiaries"

Who are these people that the RESEX claims to protect and improve? Arguably, they are "imaginary" in abstract "beneficiary" terms as I have explained earlier what resource users were doing before the RESEX and how their livelihoods and identities have become constituted. Yet, the true "beneficiaries" of the RESEX, according to resource users, are the local NGOs who allocate funds to conduct conservation projects and create protected areas. Resource users are well aware of the funds NGOs generate from donors, such as Fibria, in order to do their jobs. This led some resource users to incorporate RESEX "environmental" mentality to secure access to natural, political, and economic resources as was with other cases in Indonesia, Guatemala and India (Sundberg 2003b; Agrawal 2005; Li 2007b). In this case, the processes of

governmentality has occurred through education and the formation of associations, as resource users have been told to organize themselves to better access RESEX power and economic incentives. As Nicolau (2006, 74) stated "AMPAC, [the Shell-fisher Association of Ponta de Areia and Caravelas] is nothing more than an extension of Projeto Manguezal." Projecto Manguezal is a component of CEPENE, an IBAMA institute that conducts scientific research in the area. In this sense power is not held but diffuse and productive (Ekers and Loftus 2008) in creating environmental subjects, as IBAMA acts as mediator between the state and resource users. Interestingly, one *pescador* perceived this relationship as he asserted that ICMBio was an extension of the state, or in his words earlier, "*ICMBio is only to bring the federal government to the pescadores.*"

The majority of resource users of the Cassurubá RESEX do not consider themselves to be a "beneficiary" of the RESEX and are resistant to becoming "beneficiaries," as the results revealed. As of 2013 less than half (668) of the resource user households of the Cassurubá RESEX have registered themselves as "beneficiaries" of the RESEX. Referring back to Chapter III, resistance and the inability to coerce "threatens the assemblage" and makes indirect means of governing, or getting people to behave in ways they think is in their best interest difficult (Li 2007a). The practices of identifying and registering RESEX resource users as "beneficiaries" in general have proved to be complicated and difficult. In Corumbau, a RESEX north of Cassurubá, RESEX authorities failed to properly define "traditional population" beneficiaries early on, which resulted in conflict between locals for rights to resources, and they had to

redefine the "beneficiaries" through a participatory process with resource users (De Moura et al. 2009). In 2013, ten years after the first maritime RESEX was created (Da Silva 2004) and twenty four years after creation the first RESEX, a legal administrative procedure for creating the profile of, and ratifying, the "beneficiary" family was created (ICMBio 2013a). Once ratified, "beneficiaries" are an institutionalized artifact of RESEX and have a new relationship with the state. Producing "beneficiaries" has been such a complicated process that a decree was created for the sole purpose of defining, identifying, and ratifying them. Clearly, governing resource users of RESEX, or getting them to behave in ways they believe is in their best interest, has not been such an easy task, as Li (2007a) described for her case in Indonesia. Nevertheless, the results support the normative quasi-hypothesis; institutions of RESEX are inconsistent with livelihood strategies of terrestrial and marine resource-users (Salisbury and Schmink 2007; Vadjunec, Schmink, and Gomes 2011). The claim was examined here, rather than Chapter IV, because "beneficiaries" are also a RESEX institution and the inconsistencies are not only in rules of use, but also in the RESEX ontology of "beneficiary."

However, RESEX "beneficiaries" are is still in the process of becoming (subjects). As Foucault wrote (1980, 93), "there are manifold relations of power which permeate, characterize and constitute the social body, and these relations of power cannot themselves be established, consolidated nor implemented without the production, accumulation, circulation and functioning of a discourse." The RESEX "beneficiary" discourse has been produced, accumulated and circulated, and on the way functioning. In more normative terms, the majority of resource users of the RESEX have not fully

assumed the position of "beneficiary." Those who have are accessing the "benefits" of being seated on deliberative council (15 individuals) to fight for rights to *maintain* their livelihoods (while unknowingly impacting themselves and others), and those receiving funds from the Bolsa Verde Program get benefits in *exchange* for their livelihoods.

Nevertheless, the results presented here clearly demonstrate that the subject-producing discourse of RESEX "beneficiary" is a construction by government actors in power and not something constituted by resource users. In other words, by focusing on "beneficiaries" and promising benefits, government proceeded with the appropriation of land, and livelihoods are being compromised and (re)constituted. RESEX "beneficiaries" then, are a prime example of what political ecologists mean with the claim "things are rarely what they appear" (Robbins 2012, 124).

5.3 Conclusion

The case of the Cassurubá RESEX demonstrates how the RESEX, a community-based conservation instrument, is a hybrid form of participatory environmental governance with antagonistic effects. Although RESEX are claimed by government institutions and actors and NGOs to protect and improve the lives of resource users through access to resources, power, and economic incentives, for Cassurubá this is hardly the case. Land has been appropriated for conservation and access to resources restricted; decision-making is not representative of the diverse livelihood strategies of resource users including women; and economic incentives are not available to most resource users. Moreover, livelihoods are being compromised and reconstituted. The

intricate and diverse livelihoods of resource users that are historically and culturally embedded with the environment are being transformed, as they become artifacts of RESEX. All of this has occurred, virtually invisible, because of the institution of RESEX "beneficiary" and promise of benefits. As resource users become "beneficiaries," they become subjects of the state, accounted for, and controlled, with a new relationship to the environment. However, most resource users of the Cassurubá RESEX have not been so easily coerced into the notion of "beneficiary" and have yet to see any benefit derived from the RESEX. They perceive NGOs as having benefitted the most. Those very few that have adopted RESEX subjectivities are in positions of power flow, and have contributed to the new fishery agreement adversely impacting hundreds to thousands of other resource users including women. The case presented here shows that RESEX do not necessarily do what they are claimed to do, such as protect and improve livelihoods, and "beneficiaries" are not what they appear to be. Rather than livelihoods being improved they are being reconstituted through the RESEX instrument and authorities. The RESEX "beneficiary" is ontologically problematic and I was able to demonstrate this by problematizing the RESEX "beneficiary" using a political ecology lens and analytics of discourse. I showed how discourse, articulated though institution and abstraction, is a powerful weapon of environmental governance which objectifies and transforms people and their relations (Agrawal 2005, 166). I conclude that "beneficiaries" are an "imaginary collective subject," devoid of individual identities and interests, produced (by government actors, including situated subjects and RESEX

institutions) that renders the appropriation of land and expansion of bureaucratic state power invisible (Ferguson 1994, 280).

CHAPTER VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this Chapter I summarize the three core chapters (III, IV, V) of this dissertation and offer recommendations for future research. Specifically, a synopsis of each chapter's findings, arguments and conclusions is presented. I then summarize the theoretical contributions of this dissertation, followed by recommendations for RESEX as a conservation policy instrument. I conclude with recommendations for future research using the adapted frameworks applied in this research.

6.1 Summary of the dissertation

Conservation territories have been expanding into coastal-marine environments because of the impetus of national-scale compliance with CBD goals. One national example is the Brazilian extractive reserve (RESEX), which originated in the 1990s in the Brazilian Amazon and is increasingly being established in the country's littoral and marine spaces. Despite the win-win claims to protect livelihoods, resources, and biodiversity, empirical evidence has shown that coastal-marine RESEX (MERs) are falling short of stated goals and resulting in social conflict (Da Silva 2004; Di Commo 2007; De Moura et al. 2009; Santos and Schiavetti 2014). However, these studies fail to demonstrate how RESEX establishment materially affects resource user livelihoods because they primarily focus on governance processes internal to place specific MERs.

This research responds to the scholarship of RESEX and broader scholarship of environmental governance in the arena of conservation and development. In particular, this dissertation aimed to advance how geographers and political ecologists study the intersection between conservation and development agendas, and livelihoods of small-scale producers. In particular, there is a good deal of literature that demonstrates how conservation agendas intersect with livelihoods of small-scale producers such as farmers (Zimmerer 2006b), yet there are few cases in coastal-marine environments.

This research focused on the establishment of a coastal-marine RESEX, the governance processes, and implications for resource user livelihoods. I demonstrated how environmental governance and resource user livelihoods intersect in the global to local arena of environmental conservation and development. Using the case of the Cassurubá RESEX in Bahia, Brazil, I showed how resource-user livelihoods were negotiated and produced through discursive and territorial practices of RESEX governance. I broadly tested the claim that discursive and territorial practices of conservation units produce differentiated impacts on livelihood strategies among affected resource-users. These territorial practices were specifically demonstrated through my investigation of the institutional (policy), material (livelihoods) and discursive (text and discourse) mechanisms of RESEX establishment as presented in chapters III, IV, and V. I specifically drew from three analytics in my investigation; "governance assemblage" (Li 2007b, 2007a), an adapted capital assets livelihood approach (Bebbington 1999; Bebbington et al. 2006) and discourse analysis (Mels 2009) using a political ecology lens. The intersection of these analytics allowed me to show

how, and why, resource user livelihoods are (re)produced in the context of Brazilian RESEX and conservation in general.

First, I aimed to answer *how* and *why* the Cassurubá RESEX was established. In Chapter III, I drew from Li's (2007a, 287) governance assemblage analytic to examine an instrument "instantiated in a particular programme in a particular place" at a particular time. The framework demands examination of actors and their objectives; and "six generic" practices that bring the assemblage together. Li based her scaffold on Foucault's analytic of governmentality, or the means by which people are governed through diffuse and capillary means and not necessarily through direct control, or what would be considered obvious practices of power (Dean 2013). This is best understood in Foucault's terms as "any more or less calculated and rational activity, undertaken by a multiplicity of authorities and agencies, employing a variety of techniques and forms of knowledge, that seeks to shape conduct by working through our desires, aspirations, interests and beliefs, for definite and shifting ends and with a diverse set of relatively unpredictable consequences, effects and outcomes" (Carr 2013, 81). The framework enabled me to demonstrate that RESEX are operationalized by state actors, as a prescribed community-based conservation and development instrument with "unpredictable consequences, effects, and outcomes" (ibid 2013).

As explained in Chapter IV, RESEX are to be established per demand by locals, particularly resource users who are most directly impacted from the conservation unit. However, Cassurubá RESEX establishment was a highly politicized battle between elites, whose objective was to establish shrimp aquaculture in the area, and

environmentalists (ICMBio, CEPENE, IBAMA, and NGOs) who opposed the shrimp aquaculture project and became RESEX protagonists. The majority of resource users were hardly engaged in mobilization to create the RESEX. They were mere pawns wagered in the territorial arena of RESEX establishment, which was barely representative of the legal RESEX prescription. Further, resource user conduct was to be shaped through notions of participatory decision-making and organization. However, resource users were not so easily coerced and processes following establishment of the Cassurubá RESEX were laden with a cornucopia of deficiencies.

Deliberative council meeting attendance was low, and hardly representative of the over 2,000 resource users of the RESEX, because of socio-political and physical inaccessibility; the RESEX was re-delineated in 2013, a case brought to Brasilia by the municipality of Nova Viçosa, demonstrating politicized unrest; the RESEX has reinforced social conflict between fishermen; resource users have contested the RESEX and new institutions, and are reluctant to register with government as "beneficiaries" (a requirement of RESEX); and "beneficiaries" were still being identified, defined, and registered by ICMBio as of 2014, over five years after Cassurubá creation, and over twenty years after the first RESEX in the Amazon.

Establishment of the Cassurubá RESEX and its subsequent governance processes were essentially comprised of the "six generic practices" as proposed by Li (Li 2007a). These are discussed in detail in Chapter III; one particular practice, "anti-politics" or "encouraging citizens to engage in debate while limiting the agenda" (Li 2007a, 265), deserves additional attention.

The practice of anti-politics was obvious during Cassurubá RESEX deliberative council meetings. These meetings were held as a participatory decision-making forum for RESEX processes and institution building. However, the RESEX manager was the absolute holder of decisions who opened and closed the agenda. Any contestation, by resource users, regarding new rules of use (both formal and informal), or other concerns such as Fibria's dredging activity, were closed to debate. Resource users were presented with federal forestry and fishery institutions that contradicted the RESEX instrument, which stated that extractive rules of use must be elaborated by resource users. In the case of Cassurubá, therefore, citizens were encouraged to engage in the meetings, yet the ICMBio RESEX manager and his officials control the agenda. These findings support the quasi-hypothesis; MERs comprise a conservation agenda that curtails access to resources negatively impacting livelihoods (Neumann 2004; West and Brockington 2006; Li 2007b; Larson and Soto 2008; Lele et al. 2010; Robbins 2012). However, I extend this thesis, to account for power relations by concluding; RESEX are a territorial instrument of control over people, resources, and relationships in a geographic space.

Establishment of RESEX is a "practice of assemblage," or means of bringing different elements together to produce a desired outcome, and controlling men and their relations to things (Foucault 1991; Ferguson 1994; Li 2007b). Establishment of Cassurubá by environmentalists enabled the expansion of bureaucratic state power of which resource users are accounted for, legitimized and have a new relation with the state. In this case, resource users must be registered with ICMBio as RESEX "beneficiaries" who are to receive benefits (political and economic) from the RESEX,

and their livelihoods reconstituted through RESEX institutions. As in Li's (2007b) case in Indonesia, MERs will shape livelihoods, identities and landscapes.

These conclusions support arguments of how humans and non-humans are governed through processes of power, and how specifically planned interventions such as conservation and development, have a depoliticizing effect (Ferguson 1994; Li 2007b). Although the RESEX claims to protect livelihoods, it has appropriated access and rights to land and resources. The focus on intervening in livelihoods with goals of improvement is necessarily a process by which resource users are to have a new relationship with the state, the environment, and be accounted for as citizens (Scott 1998; Li 2007b). However, the resistance of resource users demonstrates that governing is not such an easy task, particularly in a territorial battle over resources, as was the case for Li (2007a) in Indonesia. Yet, for the Cassurubá RESEX, resource users must assume the position of "beneficiary" in order to (re)gain and maintain access to resources.

Second, I aimed to examine resource user livelihood strategies. In Chapter IV, I asked whether there was dichotomy between market oriented and subsistence based households of the Cassurubá RESEX. If a difference existed, were there also differential impacts on livelihoods from establishment of the Cassurubá RESEX and new institutions? To answer these questions I relied on an adapted capital assets and capabilities framework, or "the ways in which people transform several types of household capital assets (natural, human, financial, physical, cultural, and social) into livelihood outcomes" (Bebbington 1999; Bebbington et al. 2006, 1962). To account for social relations, including those of power, and not simply material outcomes of the

capital assets approach (Carr 2013), I cross examined household livelihood institutions and newly instated RESEX institutions.

Using K-means cluster analysis, I determined the existence of high-income market oriented, low-income market oriented, and low-income subsistence based household typologies. Chi-square analysis verified that these typologies are primarily determined by natural capital (species and habitat targeted), and human (skills and knowledge) and social capital, or in other words, the species and habitats targeted, and the location of households, determined by embedded social relations. The findings are consistent with studies that showed how marine extraction strategies were based upon social capital and spatial relations (Lansing 2009; King 2011).

However, the findings were contrary to other studies that determined market specialization and wealth resulted from *more* assets in the form of financial capital (stocked assets), human capital (labor and age), and natural capital (land, resources) (Coomes and Burt 2001; Coomes 2004; McSweeney 2004b). Specifically in this case, market oriented, high income households had low investment in boat and gear and were younger; market oriented, low income, households had high investment in boat and gear and were the most diversified in terms of strategies; subsistence based, low income households were older, had low investment in boat and gear, and more household labor. The latter two typologies are comprised of the most women. However, the reason the findings of this case differs from the literature is the context. Fishery livelihoods are complex with resource users extracting diverse and mobile species to prevent shocks to their livelihoods. The terrestrial studies focused on extraction of one resource, such as

charcoal (Coomes and Burt 2001) chambira (Coomes 2004) or mixed forest product (McSweeney 2004b). This exhibits the challenge in making cross comparison of livelihood strategies under different livelihood contexts. Also in this case, I was unable to examine forest extraction or farming activities as resource users have been prohibited to conduct these practices because of RESEX new rules of use. Nonetheless, the capital assets and capabilities framework was key to understanding resource user livelihood strategies of the Cassurubá RESEX.

More importantly, I showed how new RESEX institutions have differentially affected households, and particularly low income households have been the most compromised by new rules of use. *Pescadores* have experienced financial loss because of new rules for nets used, and have lost access to fishing grounds because of new zoning rules. The new zoning institution prohibits fishing with motorized boats within 500 meters from the shore, along a segment of the shore in Nova Viçosa. Shrimpers have lost access to these grounds and low-income households with smaller boats cannot travel as far out from the shore, as those with stronger motors, and will be impacted by this new law. The new zoning rule also conflicts with the diversification strategies of shrimpers and bonito *pescadores* and behavior of shrimp and whales. Shrimp are in the near shore, muddy, warm waters in winter and disperse to more open water in summer when the water gets too warm. *Pescadores* of bonito alternate to shrimping in winter when humpback whales are present because of potential danger the whales impose. Therefore bonito *pescadores* have also lost access to fishing grounds in winter. These findings contribute to evidence of how conservation agendas and the creation of marine

protected areas are conflicting with livelihood strategies of fisherfolk which are spatialized (Lansing 2009; Walker and Robinson 2009; King 2011) In this case the new fishery institutions did not account for the behavioral patterns of shrimp and humpback whales, nor the livelihood strategies of fishermen.

The majority of shrimpers and bonito *pescadores* are from market-oriented low-income households. *Pescadores* of reef fishes are mainly market oriented, high-income and are unaffected by the new laws. Therefore, the most marginalized households are most impacted by new fishery institutions of the Cassurubá RESEX. Further, the new informal rules regarding land use negatively impact the subsistence-based, low-income households of the *zona ribeirinha*. The findings in Chapter IV support the broad argument that the RESEX has differential impacts on affected resource users and support the quasi-hypothesis that conservation and development agendas need to consider the differential livelihood strategies of resource users or efforts will be undermined (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004b; Carr and McCusker 2009; Lansing 2009; Walker and Robinson 2009; Chowdhury 2010; King 2011; Carr 2013). In other words, conservation and "development projects need to incorporate social science expertise much earlier in the project design stage than is common at present" (Carr and McCusker 2009, 569), because failure to do so can lead to unintended consequences on livelihoods. I conclude that livelihood strategies of resource users should inform design and implementation of new institutions to reach livelihood and sustainability goals of RESEX in Brazil and elsewhere.

Third, I aimed to determine how resource users were adjusting to or contesting the RESEX. Specifically, I asked *how* and *why* are RESEX "beneficiaries" produced? How have resource-users contested or adjusted to the status of "beneficiary"? What are the specific social and political effects of establishment of the Cassurubá RESEX? I answered these questions by problematizing the RESEX "beneficiary" in Chapter V using a political ecology lens (Robbins 2012) and analysis of discourse (Mels 2009). For scholars of environmental governance and political ecology, influenced by Foucault, discourse is a powerful weapon used to subjugate, objectify, and control humans and their relations, and shape the environment (Willems–Braun 1997; Agrawal 2005; West, Igoe, and Brockington 2006; Li 2007b; Mels 2009; Robbins 2012). Marxist approaches perceive discourses as "devises of abstraction vital to capitalism's production of nature" (Mels 2009, 391) and scholars recognize that discourses produce material effects (Harvey 1996; West, Igoe, and Brockington 2006). By fusing Foucaultian and Marxist approaches to discourse, political ecologists demonstrate how discourse are "institutionally based, materially constrained, experientially grounded manifestations of social and power relations" (Harvey 1996, 80) and shapes humans, their relations, and the biophysical environment (Mels 2009). By adapting this lens, and analytic of discourse, I demonstrated that the notion, and materiality, of RESEX "beneficiaries" is contentious.

In RESEX terms, "beneficiaries" are the identified and registered resource users who will have access to government political and economic incentives, or the *Políticas Públicas* explained in Chapter III. The definition of, identification of, and registering of

RESEX "beneficiaries" are ongoing processes of RESEX. In December 2013, over twenty years after the creation of the first RESEX, a legal prescription to define "beneficiaries" was created (ICMBio 2013a). As of 2014, five years after Cassurubá establishment, RESEX "beneficiaries" were still being (re)registered with ICMBio.

For Cassurubá the notion of "beneficiaries" is in "perpetual reversal" (Dean 2013) as resource users repeatedly asked who RESEX beneficiaries were, during RESEX meetings, and government authorities told them to identify and register themselves. Resource user questioning of "beneficiary" is contestation to the notion of "beneficiary," which is closed off and reversed by authorities. The abstraction of resource users as "beneficiaries" by RESEX actors further erases the culturally and historically embedded livelihoods of resource users and assumes they are one entity with the same interests (Ferguson 1994; Li 2007b). As elaborated in Chapter V, resource user livelihoods have been socially and culturally embedded for generations, with women playing a major role in fisheries, who are hardly represented in RESEX decision-making.

Moreover, the notion of "beneficiary" is ontologically problematic because the majority of resource users did not perceive themselves as having benefitted from the RESEX. Most feel as though their livelihoods have been disturbed from RESEX establishment. Perhaps more ironic is that many of the benefits of the government incentives (*Políticas Públicas*) are not accessible to resource users of Cassurubá, particularly those for agriculturists, because of the new informal land use rules. The only "benefit" that has manifested is the Bolsa Verde where resource users are paid a nominal

amount (R$300 every three months per household) for allowing forest regrowth. They can then use the funds to purchase produce, in the difficult to access peri-urban centers, since they are prohibited from farming activities. Abstracted from their livelihoods, resource users are being reconstituted as "beneficiaries" and they become artifacts of the RESEX and their land and labor become conservation commodities. As West et al. (2006) argue of natives, they "may also become commodities, as their culture becomes part of the selling point for people-centered conservation initiatives or ecotourism marketing."

As Ferguson states, "ideas and discourses have important and very real social consequences" (1994, xv) and "power relations are ubiquitous and subjectivity is both enabled and contrained by relations of power" (Cruikshank 1999, 2). On the one hand, there is the art of statecraft and the construction of subjects and identities to control resource use and subjects (Goldman 2004; Agrawal 2005; Goldman 2005). On the other hand, marginalized resource users construct or modify identities to gain rights and access to resources and become subjects of the state (Sundberg 2003a; Agrawal 2005; Li Murray 2007; Vadjunec, Schmink, and Gomes 2011).

In the case of Cassurubá, some resource users have internally enrolled as "beneficiaries" and taken on environmental and RESEX mentalities. They have placed themselves in positions to access political power and are accessing financial benefits of the RESEX designated for communication and education projects through associations they have formed. These few individuals also contributed to the new fishery agreement, which is affecting hundreds to thousands of resource users including women. This has

occurred through a RESEX ideology, reproduced by local government and NGO officials, adopted from the RESEX model originating in the Amazon. As Foucault states, "it is already one of the prime effects of power that certain bodies, certain gestures, certain discourses, certain desires, come to be identified and constituted as individuals" (Foucault 1980, 98). While few individuals are gaining benefits from the RESEX because of their "elite" status, the majority of resource user's livelihoods are being negotiated and (re)produced through the RESEX instrument. Land has been appropriated, livelihoods restricted and reconstituted, under the veil of improving livelihoods and the discourse of RESEX "beneficiary." These findings support the argument that discourse is a weapon of power that may objectify people and constitute them subjects of actors in power (Ferguson 1994; Willems–Braun 1997; Escobar 1998; Goldman 2004; Agrawal 2005; Robbins 2012); and is the practice of governing "men in their relations with things…wealth, resources, means of subsistence…territory…" (Foucault 1991, 93). This led to my argument that "beneficiaries" are an "imaginary collective subject" devoid of individual identities and interests, produced (by government actors, including situated subjects and RESEX institutions) that renders the appropriation of land and expansion of bureaucratic state power invisible (Ferguson 1994, 280).

Finally, the findings of Chapter V support the quasi-hypothesis that the institutions of RESEX are inconsistent with livelihood strategies of terrestrial and marine resource-users (Salisbury and Schmink 2007; Vadjunec, Schmink, and Gomes 2011). This hypothesis was presented in Chapter V, rather than Chapter IV because it is not

only institutions in place, such as the fishery agreement and new land use rules, that are inconsistent with livelihoods but also the inherent RESEX institution, and the institution of RESEX "beneficiary." The original RESEX institution was designed to safeguard the livelihoods of extractivists, and be flexible and accommodate the livelihood strategies of resource users as they elaborate rules of use (Allegretti 1990). Unfortunately, this is not the case for Cassurubá.

6.2 Conclusions

With these conclusions, I aim to have brought the three core chapters of this dissertation into dialog. In Chapter V, I concluded that the RESEX is a territorial instrument of control over people, resources and relations because of the practices of Cassurubá RESEX establishment and governance. This argument became more evident in Chapter V, as new formal and informal institutions ironically contradict with resource user livelihood strategies. The "practices of government," therefore, through the RESEX instrument is veiled through the focus on RESEX "beneficiaries" as demonstrated in Chapter V. This is an example of "how the control of…livelihoods was framed through development discourses" (Carr 2013, 82), in this case the focus on "beneficiaries" and benefits of the RESEX.

These outcomes are surprising because the RESEX is renowned as a charismatic community-based conservation instrument, because of the legacy of Chico Mendes, and aimed at safeguarding the livelihoods of extractivists. However, several other studies of RESEX demonstrate the imperfections of the model and inability to meet the economic

and social needs of extractivists in terrestrial (Hecht 2007; Salisbury and Schmink 2007; Maciel et al. 2010; Vadjunec, Schmink, and Gomes 2011) and coastal-marine environments (Da Silva 2004; De Moura et al. 2009; Di Commo 2007; Glaser and Oliveira 2004). Taken together, in normative terms, these studies and this research demonstrate that RESEX do not produce general "win-win" outcomes. There are trade-offs between protecting livelihoods and protecting biodiversity, and there are trade-offs between resource user "winners" and resource user "losers." Certain resource users are able to access political (decision-making) and economic benefits (government incentives) while others cannot because of a variety of socio-political-economic reasons as the case of Cassurubá demonstrated. RESEX produce differential livelihood impacts on affected resource users that cannot be ignored. The outcomes arise not only from disregard of livelihood strategies and institutions in place by RESEX authorities, but also from the practices of power, by various actors, through RESEX institutions. RESEX livelihoods and RESEX governance, therefore, cannot be investigated as discrete elements as this renders each "apolitical," as would be the case for any community-based conservation instrument. In other words, any conservation instrument inscribed with "livelihoods" or goals of improvement, demands examination of both livelihoods and governance as they are entangled.

6.3 Theoretical contributions

This research contributes to the overlapping bodies of literature concerning environmental governance and small-scale producer livelihoods in human-environment

studies in geography. First, the three core chapters (III, IV, V) of this dissertation support an argument that political ecologists have previously made: livelihoods are often compromised, as opposed to improved, from conservation and development agendas (Neumann 2004; Peet and Watts 2004; Robbins 2004; West and Brockington 2006; West, Igoe, and Brockington 2006; Zimmerer 2006b; Li 2007b; Larson and Soto 2008; Lele et al. 2010; Goldman, Nadasdy, and Turner 2011; Robbins 2012). In Chapter III, I tested the normative claim that MERs comprise a conservation agenda that curtails access to resources negatively impacting livelihoods (Neumann 2004; West and Brockington 2006; Li 2007b; Larson and Soto 2008; Lele et al. 2010; Robbins 2012). I extended this argument, to account for power relations by concluding that RESEX are a territorial instrument of control over people, resources, and relationships in a geographic space, drawing from scholars concerned with power in conservation and development agendas (Sack 1989; Ferguson 1995; West, Igoe, and Brockington 2006; Li 2007b; 2007a).

This also contributes to Robbins (2012, 21) thesis of conservation and control: "Control of resource and landscapes has been wrested from producers, or producer groups (associated by class, gender, or ethnicity) through the implementation of efforts to preserve 'sustainability', 'community', or 'nature''. In the process, local systems of livelihood production, and socio-political organization have been disabled by officials and global interests seeking to preserve the environment," which is particularly evident in the case of Cassurubá. Although intentions of these global and national agendas are considered good, nuances are often overlooked and unintended consequences occur.

Geographers and political ecologists have been concerned with the ways in which conservation and develop agendas undermine the livelihoods of small-scale producers. A major component of Zimmerer's (2006b) work on environmental globalization has been to point out how global conservation agendas intersect with small scale producers. This research contributes to this literature in Geography showing how global environmental agendas, such as the Convention on Biological Diversity (CBD) and World Parks Congress (WPC) transcends scales, through the national level through agreements, and to the local through government and NGO actors in place, as occurred in coastal Brazil. The case of the Cassurubá RESEX contributes to geographic scholarship of the interface between conservation and livelihoods. There has been a good deal of literature showing how conservation intersects with livelihoods of small-scale farmers (Zimmerer 2006b), yet there are few examples in coastal-marine environments: Mexico (Young 1999; Young 2001), the Pacific Coast, USA (Mansfield 2007), Honduras (Lansing 2009), French Polynesia (Walker and Robinson 2009) and South Africa (King 2011).

Second, this research advances the analytical methods used to examine the interface between conservation and livelihoods. By converging Li's governance assemblage analytic (2007a) and the capital assets livelihoods approach (Bebbington 1999; Bebbington et al. 2006), I was able to demonstrate the cross-scalar relationship between environmental governance (or conservation) and livelihoods. As stated in the conclusion, livelihoods and environmental governance cannot be cannot be investigated as discrete elements in community-cased conservation as this renders each "apolitical."

Power relations must be addressed in human-environment studies of governance and livelihoods, as Carr (2013) and Li (2007b) would argue.

This research contributes to environmental governance and livelihoods literatures that draw from Foucault's notion of governmentality and the "practices of government" (Agrawal 2005; Li 2007a, 2007b; Carr 2013, Robbins 2013) advancing the way government power is perceived as diffuse, capillary, and productive rather than centralized (Dean 2013). Furthermore, this is the first study to examine "practices of government" of a RESEX through Li's (2007a) assemblage, and how practices, institutions, and discourse specifically intersect with the everyday material livelihood practices and strategies of resource users. The lens and analytical methods employed in this research enabled this.

Third, and on a more normative note, this research contributes to literatures that argue that livelihood institutions should inform conservation and development agendas must consider the differential livelihood strategies of resource users or efforts will be undermined (Coomes, Grimard, and Burt 2000; Coomes and Burt 2001; Coomes 2004; McSweeney 2004b; Carr and McCusker 2009; Lansing 2009; Walker and Robinson 2009; Chowdhury 2010; King 2011; Carr 2013). This aspect of the research also advances the livelihoods approach because there are few examples in marine environments as argued by Allison and Ellis (2001) and particularly those using quantitative, or mixed methods for examining household livelihood strategies are virtually non-existent.

Lastly, this research advances scholarship of the Brazilian extractive reserve (Browder 1992; Da Silva 2004; Glaser and Oliveira 2004; Di Commo 2007; Hecht 2007; Salisbury and Schmink 2007; De Moura et al. 2009; Maciel et al. 2010; Vadjunec, Schmink, and Gomes 2011). These scholars question the social, political, and economic feasibility of the RESEX model, and my claim; the RESEX institution is inconsistent with livelihood strategies of terrestrial and marine resource-users, confirms the ambiguity between the model and RESEX processes in place that these scholars address. This research also advances this scholarship through its analytical method, as described above, as is the first to examine the intersection between RESEX institutions and the material livelihood strategies of coastal-marine RESEX (MERs) resource users.

6.4 Evaluation of RESEX

Is the RESEX doomed to reproduce socio-economic inequality in areas outside sites or cases of high social mobilization? This brief section specifically focuses on the MER/RESEX as a conservation and development instrument (Da Silva 2004; Glaser and Oliveira 2004; Di Commo 2007; De Moura et al. 2009) questioning its effectiveness in sustaining livelihoods (Browder 1992; Salisbury and Schmink 2007; Maciel et al. 2010; Vadjunec, Schmink, and Gomes 2011) and provides potential solutions to RESEX governance problems. The focus of this dissertation has been on socio-political processes of RESEX and not ecological or biodiversity. However, recommendations for moving forward with examining effects on biodiversity are also proposed.

Establishment of RESEX is a complicated, and often controversial process. This should be expected in arenas of territorial conflict over resource access and use. Most RESEX have been established as a result of social and political processes triggered by conflicts. As with other coastal-marine RESEX (MERs) (Da Silva 2004; Glaser and Oliveira 2004; Di Commo 2007; De Moura et al. 2009), establishment of the Cassurubá RESEX was laden with issues. Specifically, there has been damage to social capital, as in Da Silva's case (2004), from new institutions. The Cassurubá RESEX has reinforced conflict between *pescadores* of Alcobaça, Nova Viçosa and Caravelas. There will be financial loss because of gear restrictions without compensation. The new fishery law that prevents motorized boats from shrimping along a portion of the shore has undermined extraction diversification strategies, and social capital. The laws affect entire households, including women who clean shrimp, and those in need whom *pescadores* share their by-catch with. The RESEX manager has imposed informal land-use rules undermining subsistence based livelihoods and local food security. There have been issues in determining who the RESEX "beneficiaries" are, as was the case for de Moura et al. (2009) in the nearby Corumbau RESEX. The case of Cassurubá and other studies of RESEX demonstrate that despite the RESEX "blueprint" operationalization is a controversial endeavor.

The flaw of the RESEX may not necessarily be the instrument itself, as it originated as a cause to protect resource users access to land and resources. The establishment of RESEX in both terrestrial and marine spaces, such as Cassurubá, necessarily complicates socio-political processes. With complex and diverse livelihood

systems, it is no surprise that processes have turned out so messy, particularly with the livelihoods of resource users. The Cassurubá case here demonstrates that the main issues are in the operationalization by certain actors in power and in institution building. Specifically, RESEX are designed to cater to the needs of resource users and it is they who determine rules of use, whether on land or for marine resources. This did not occur in Cassurubá. The fishery agreement was barely representative of resource users and the RESEX manager has imposed land use rules that contradict with the subsistence farming practices of resource users. A flaw of the Cassurubá RESEX originates in power relations, particularly the practice of power by the RESEX manager of Cassurubá.

Claims regarding decentralization (Ribot and Larson 2005; Larson and Soto 2008) are relevant here. Rather than power being devolved to resource users, as defined in the practice of democratic decentralization, the RESEX manager, who makes the ultimate decisions, exercises power. This is of no surprise since decentralized resource governance often falls short of its stated goals (Zimmerer 2006b) and has been referred to as a "pipedream" (Capistrano and Colfer 2005). A discussion of decentralization is beyond the scope of this dissertation yet it should suffice to say in decentralization terms, that costal-marine RESEX are not reaching stated goals. Zimmer (2006) emphasizes the importance of the state and multi-scale institutions in environmental governance. Yet, although the state plays a role in RESEX as the administrator with RESEX federal institutions, it is local power relations that determine whether goals are being met.

Because of this issue of power relations and conflict resulting from RESEX, I suggest that the RESEX appoint an ombudsperson, perhaps regional for financial feasibility, who can represent the rights of resource users, and address when their rights are violated. Also worth considering is an institution that allows resource users to impeach, or expel, the RESEX manager. RESEX managers play a large role in institution building affecting hundreds to thousands of resource users and if they lack training in the social sciences, as in the case of Cassurubá, they hardly sympathize with the needs of resource users. Finally, because of the socio-political nature of RESEX, each RESEX should also be staffed with a social scientist with equal standing to the RESEX manager. This last recommendation could be said to be unfeasible because of costs, however, with the large amounts of money being donated to conservation by major donors such as the Walton Family Foundation, and the Gordon and Betty Moore Foundation, particularly in coastal-marine environments, it is possible.

In regard to protecting biodiversity and livelihoods of MERs in coastal Brazil, there is an imbalance as was this dissertation that examined the livelihoods aspect. Livelihoods cannot be so easily improved in strict economic terms as this dissertation demonstrated. Livelihoods are complex as are the socio-political-economic processes underlying them. RESEX authorities have used "cut and dry" solutions to ameliorating the impact of RESEX establishment on resource users.

As for biodiversity, or specifically fisheries, data is scarce for the Cassurubá RESEX and decisions for sustaining fisheries have been made without thorough, or thoughtful collaboration with resource users. This is a case where the fishery data that

was collected from resource users was used against, rather than with them (REF Camboa study). As resource users of Cassurubá RESEX explained, they were tired of being studied, interviewed, and examined by NGOs and government. They did not see themselves as deriving any benefit from research (Chapter V).

Education and communication programs in place should not focus on teaching resource users what a RESEX is but work with resource users to enable sustainable fisheries from within, or build local capacity. For example, if fishing boats were given GPS, as promised (Chapter III), they could spatially document their outings, location, and frequency. If a new institution involved teaching fishermen to record their daily catch, and if this became a formal institution as with fisheries in the Northeast of North America, they would not only perceive but also record increases and declines in catch. Simply put, this is collaborative and sustainable data collection. Again, with funding for communication and education available from Fibria, this is possible.

6.5 Recommendations for future research

First, my initial application of Li's (2007b) governance assemblage analytic was to examine who was determining the means and outcomes of RESEX establishment, and power relations, surrounding the Cassurubá RESEX. The discovery of the actual processes of RESEX establishment, and governance in the following years, led me to my argument that RESEX are a territorial instrument of control over people, resources and their relations. Had it been the case that the majority of resource users had indeed mobilized for RESEX establishment, and been more representative of decision-making

in subsequent years, my argument would not hold and the analytic would not follow through. In other words, Cassurubá processes would not fit well into the "six generic practices" proposed by Li (2007a). This was not the case however, as resource users of Cassurubá have little political power and the "practices of assemblage" are practices by actors in power (Li2007b).

It is important to note the "six generic practices" are not necessarily sequential but may occur and reoccur simultaneously, and overlap, as environmental governance is an ongoing complex process. The framework is hardly flawed, yet a seventh generic practice could be included, one which better reflects the role and influence of non-human actors in the assemblage, particularly of the biophysical environment. For example, resource users of Cassurubá are geographically isolated, yet spread out, in the *zona ribeirinha* where the land was appropriated, and tides determine accessibility to the eleven "island" areas. Therefore, their geographic isolation in space, and the tides, made it easier for pro-RESEX mobilizers. It minimized contact with the majority of resource users to inform them of the RESEX and what was happening. If the terrestrial area of the RESEX had been intact (not separated by tidal rivers) and closer to the peri-urban areas, the outcomes would have been conceivably different. Perhaps an additional element should be *the biophysical*; and the seventh practice should be referred to as *advantages and disadvantages of space and the biophysical environment.*

Second, in adapting the "capital assets and capabilities" approach (Bebbington 1999; Bebbington et al. 2006), I aimed to not downplay social relations of power by accounting for institutions at the household and across scales as recommended by

various scholars (Bebbington et al. 2006; King 2011; Carr 2013). By examining the livelihood strategies of resource users and comparing them with new institutions of the Cassurubá RESEX I was able to specifically demonstrate how new institutions and livelihoods intersect. This supports the demand for more studies at the household scale (Zimmerer 2004; Carr 2013).

However, the capital assets approach and this research was not short of its flaws. I was unable to account for specific farming practices of resource users, as I could not analyze the farming practices because resource users were no longer farming. Therefore, the livelihood strategies of Cassurubá resource users are more complex than presented in Chapter IV. Had I been able to document farming practices, there would have been pitfalls in statistical analysis and standardizing data across fishery and farming practices. As previously mentioned other scholars who applied statistical methods tended to focus on one type of resource or a few forest products (Coomes and Burt 2001; Coomes 2004; McSweeney 2004b). It was also challenging, as explained earlier, to compare the case of Cassurubá with terrestrial cases that had adapted the livelihoods household capital assets approach. However, examples of applying inferential statistics to livelihoods approach are virtually non-existent for fisheries and the few studies that do exist use ethnographic methods and, or, basic descriptive statistics (Lansing 2009; Walker and Robinson 2009; King 2011). More studies are needed, that apply the livelihoods approach in coastal-marine environments, to inform conservation policy as suggested by Allison and Ellis (2001). This case, however, demonstrates the value in mixed qualitative and quantitative methods for examining and understanding small-scale producer livelihoods.

Third, a political ecology approach (Robbins 2012) and discourse analysis (Foucault 1980; Thayer 2000; Li 2007b; Mels 2009) aided in bringing this research, and dissertation, together. By specifically examining the discourses of various actors, including written texts and discourses spoken as practice by various actors, I was able to demonstrate how discourse is a weapon of power in environmental governance. In this case I examined the discourse surrounding RESEX "beneficiaries" or how officials articulated "beneficiary" in RESEX texts, and how resource users perceived it themselves. I analyzed discourse in abstract and material terms. This analysis was key in determining how resource users contest or adjust to the RESEX. I was able to specifically demonstrate how resource users have contested theirs status, as "beneficiaries," by asking them the simple question; "are you a RESEX "beneficiary?"

However, it was more challenging to explain how the few resource users assumed the position of "beneficiary" and RESEX and environmental mentality. This is perhaps because this finding was unanticipated and there were few individuals who emerged late during field research. Further, an explicit environmentality (Agrawal 2005) framework was not applied at the onset of this research. With that said, Agrawal's framing (2005) would not work very well in this case as he posits the notion of examining individual "subjectivities" and opposes categories such as gender. In this case, at this point in time, female resource users of the Cassurubá RESEX perceive themselves as *marisqueiras*, a gendered self-identity that could not be avoided in examining RESEX discourses, nor livelihoods. Nonetheless, the discourse analysis achieved the goal of comparing how actors in power execute RESEX discourses, and

how RESEX subjects adapt to, or contest the discourse. The Cassurubá RESEX and its beneficiaries are still in the making and only time will tell how governance practices and livelihoods evolve. This is a case where longitudinal research would be worthwhile to examine how subjectivities change and evolve.

Fourth, this research focused on livelihoods, or the socio-political-economic processes surrounding RESEX and not specific ecological processes and biodiversity. Assessing biodiversity from an ecological perspective was not an objective of this research as demonstrated by the research hypotheses examined and questions posed in Chapter I. This was a shortcoming in this dissertation because RESEX aim to protect both livelihoods and biodiversity and scholars interested in socio-ecological systems may be dissatisfied.

Finally, a cross-comparison study, adapting the analytical methods of this research, of MERs in eastern Brazil would be very valuable in understanding the specific livelihood outcomes from MER establishment and contribute to building a stronger scholarship of RESEX, and community-based conservation in general, to better inform conservation policy.

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APPENDIX A

HOUSEHOLD SURVEY INSTRUMENT

Determinants of Livelihood Strategies in a Marine Extractive Reserve
Household Livelihoods Survey

Enumerator	Respondent ID	Date	Time (start-finish)

Section A: Knowledge of the Cassurubá RESEX

First I will ask you what you know about the Cassurubá RESEX

A1. What do you know about the Cassurubá RESEX? Do you know the boundaries and or rules? If yes what are they? Have you see a map of the RESEX? [Show map]

A2. Have you participated in Cassurubá RESEX planning, meetings or management? If so, please explain.

A3. Has resource access changed since the Cassurubá RESEX was established? If so, how?

A4. Are you a RESEX beneficiary? Why or why not?

A5. Do you find the RESEX as something positive, negative, or neutral? Why?

Section B: Livelihoods Card Sorting Activity

I will ask you to sort cards with pictures that represent your livelihood income for 2012 and your idealized livelihood income.

B1. Please choose the cards that best represent your household livelihood activities for 2012 and rank them in order of most important to least important for your livelihood. [List other]

Card	Fish	Shrimp	Shellfish	Livestock	Agriculture	Coco	Tourism	Office	Fibria	Retirement	CCTs	Other
#												

B2. Now please rank the cards you chose in order of most important to least important for your household income (market-based).

Card	Fish	Shrimp	Shellfish	Livestock	Agriculture	Coco	Tourism	Office	Fibria	Retirement	CCTs	Other
#												

B3. Now please rank the cards you chose in order of most important to least important for household subsistence (consumption).

Card	Fish	Shrimp	Shellfish	Livestock	Agriculture	Coco	Other
#							

B4. Please place on each month the card/s that best represent your household livelihood income for that month. [Give respondent duplicates of the cards chosen in B1 to draw from]

B5. Now please choose the cards that represent the ideal livelihood activities for your household.

Card	Fish	Shrimp	Shellfish	Livestock	Agriculture	Coco	Tourism	Office	Fibria	Retirement	CCTs	Other
#												

Section C: Livelihood Activities and Assets

Now I will ask you about your livelihood activities and assets.

C1. Land Holding & Livestock (Type= Crop/Pasture/Fallow): (Ownership= Own/Rent/Other): (Inputs= Machinery, Fertilizer, Pesticides, Seeds, Livestock, Animal feed)

Parcel	Type	Area	Ownership	Years	# Pers	Inputs	Product	Harvest Month	Kg	Home %	Market %	Sell $

Livestock	#	Ownership	Years	# Pers	Inputs	Sale Month	Kg	Home %	Market %	Sell $
Cattle										
Poultry										
Pig										
Other										

C2. Marine Extraction (FG=Fiberglass)

Marine Species Extracted	Month/Season	Monthly Catch (Kg)	Home %	Market %	Sell Price	#Pers	Gear used	Habitat

Gear		Gear Ownership				Boat		Boat Ownership				Boat Material			Size	Speed
Type	*#*	*Own*	*Rent*	*Borrow*	*Value*	*Type*	*#*	*Own*	*Rent*	*Borrow*	*Value*	*Wood*	*FG*	*Other*	*meters*	*Km/h*
Seine						Canoe										
Gill Net						Motor										
Rod						Other										
Line																
Trap																
Hook						*# of Additional Items on Boat*						*Other Notes*				
Freezer						Bunks						[price paid for gas/oil in one outing]				
Ice box						Freezer										
Other						GPS										
						Other										

C2a. Who do you sell your catch to?
C2b. How is the profit divided?

C3. Do you identify yourself as a fisher/shell-fisher/farmer? Please explain.

C4. If you were not able to extract marine resources, practice agriculture, or raise livestock what would happen? [Open response]

Section D: Household Demographics and Assets

Now I will ask you about your household members and assets.

D1. Demographics and Assets

Household Age (Years in Residence)	Address/Location & Birthplace	Fisherman's Colony	Fishery closure security (seguro defeso)

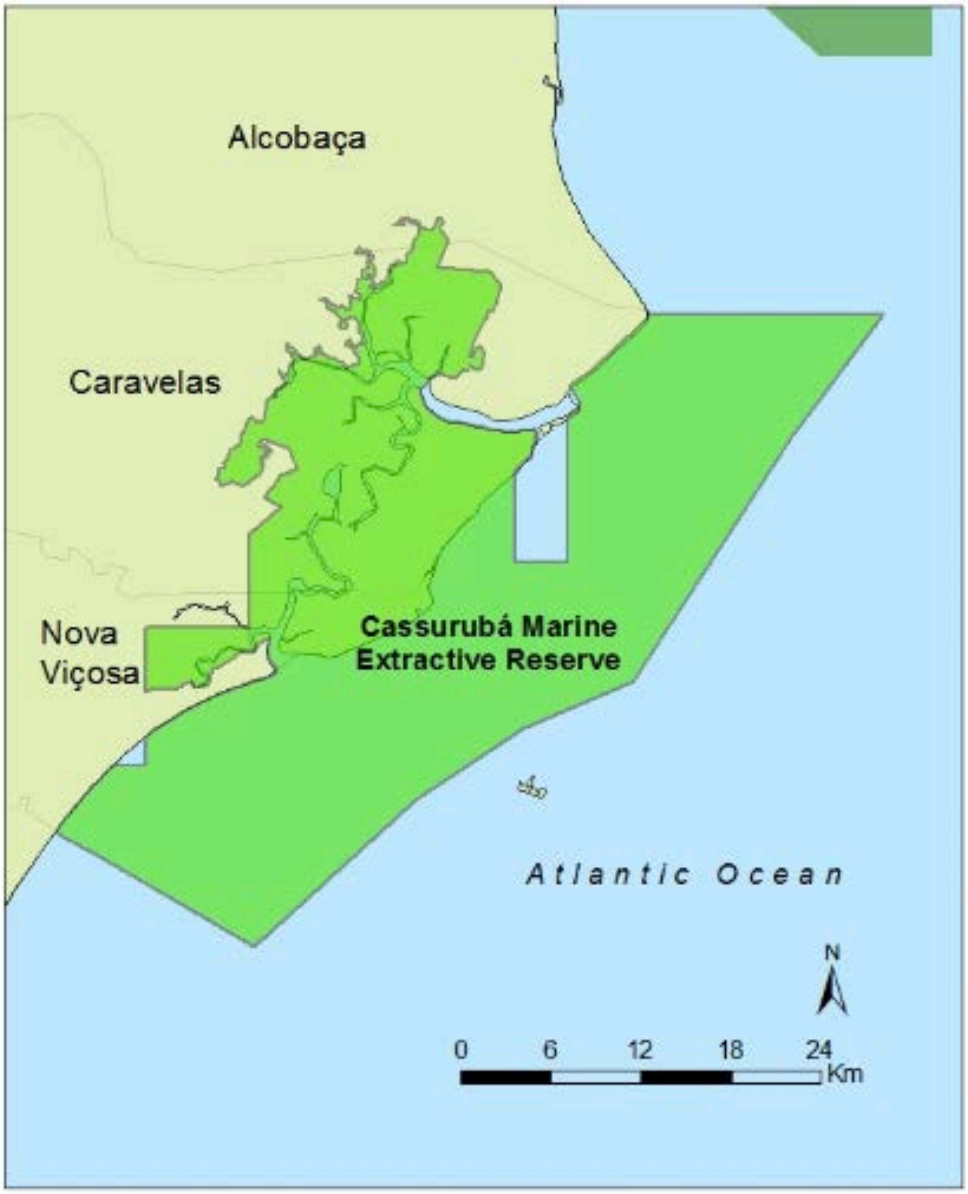
Name of Household Member (Begin with heads of household)	Relation to HH	Age	Sex	Education Level	Occupation 2012: Monthly Income					
					Marine	*Agriculture*	*Tourism*	*CCTs*	*Retire*	*Other*

Est. Household Monthly Income	
Member Association	
Receives Credit?	

Dwelling	#Rooms	*Roof*	*Floors*	*Walls*	*Plumbing*	*Electricity*
Own		Tin	Concrete	Brick	Running water	Grid
Rent		Tile	Tile	Concrete	Cistern	Solar
Squat		Other	None	Painted	Sewerage	
Other			Other	Tile	$/Month	$/Month

Vehicles	#	*Own/Rent/Borrow/Other*	*Other notes*

Section A: Map utilized



Section B: Cards used in survey instrument