PARTICIPATION, SOCIAL CAPITAL AND GENDER IN SEA TURTLE CONSERVATION, NORTHEAST BRAZIL

By

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ABSTRACT

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Increasing participation in conservation programs is viewed as necessary in today's world; however, more knowledge is needed regarding how to engage communities. This dissertation aims to deconstruct participation by exploring community-level social capital, gender differences, and their potential influence on attitudes and participation in conservation programs. Instead of solely evaluating current participation and participants in conservation programs, this study employs the conceptualization of social capital (networks, trust, and norms) to examine both conservation and non-conservation related participation in four communities along the northern coast of Bahia, Brazil. The dissertation is organized into three chapters, with the first presenting five considerations for improving our understanding, application, and assessment of participation in conservation. I propose that the conceptualization of participation held by conservation scholars and practitioners needs to mirror already-established ideals of participation at the community level, bringing clarity and specificity to participation in theory and practice, and addressing issues of space and context. The second chapter examines the influence of social capital and conservation attitudes on participation in sea turtle conservation in northeast Brazil by employing confirmatory factor analysis and structural equation modeling. Findings suggest that social capital

could be just as influential as conservation attitudes when working to engage communities in conservation. The third chapter uses a mixed methods approach to explore gender differences in conservation participation by investigating gender differences in access, attitudes and agency in participation. Questionnaires and focus groups indicate greater gender differences in access and agency than attitudes toward sea turtle conservation. In addition, my findings provide new information on how people want to participate based on motivations and activities that better match their needs, responsibilities, interests and desired benefits. Social capital provides a framework for understanding how the structural and cognitive aspects of participation interact, providing a more complete picture of community dynamics and individual interests. By deconstructing non-conservation related participation at the community level to understand how and why people participate, as well as the underlying influences, this research can be used to better the design and target of conservation programs resulting in greater and more meaningful participation by a more diverse representation of the community.

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KEY TO ABBREVIATIONS

APA	Area Protegida (Protected Area)
CBC	Community-based Conservation
CBNRM	Community-based Natural Resource Management
CFA	Confirmatory Factor Analysis
CNRM	Community Natural Resource Management
EFA	Exploratory Factor Analysis
Fundação Pró TAMAR	Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas
IAC	Inter-American Convention for the Protection and Conservation of Sea Turtles
ICDP	Integrated Conservation and Development Programs
IBGE	Instituto Brasileiro de Geografia e Estatística
IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis
ICMBIO	Instituto Chico Mendes de Conservação da Biodiversidade
IUCN	International Union for the Conservation of Nature
MTSG/IUCN	Marine Turtle Specialist Group/World Conservation Union
PRM	Participatory Resource Management
SEM	Structural Equation Model
SEMA	Secretária do Meio Ambiente, Bahia
SOCAT	Social Capital Assessment Tool
TAMAR	Brazilian National Sea Turtle Conservation Program
WCS	World Conservation Strategy

INTRODUCTION

Participation in conservation often falls short in meeting social and conservation goals, with the majority of research focusing on the co-management of natural resources often referred to as community-based conservation (CBC) or community-based natural resource management (CBNRM). However, co-management is not always possible in species or biodiversity conservation where planning and decision-making is made at the national or international level, particularly in the case of endangered species such as sea turtles. Even in most CBC and CBNRM cases, planning and decision-making at the community level occurs only to come to consensus about how the conservation effort will be carried out (e.g. predefined goals and objectives, with the local actors not involved in conservation decision-making). Unfortunately, CBC and CBNRM have become synonymous with community participation or involvement of any kind from education and awareness to employment, ignoring the various forms of participation and their individual and collective value in meeting conservation and social goals. By not embracing the continuum of participation at all levels and distinguishing our work accordingly, we are leaving out a significant number of conservation efforts that are not fit for co-management without any real guidance or research on how to work with and engage communities in conservation.

Similar to participation, social capital is also viewed as a silver bullet to accomplishing things that individuals, governments, and markets have been unable to achieve. However neither of these concepts have held up to the expectations. I argue that it is a result of the way they have been employed, conceptualized and researched,

and that they are still useful concepts for conservation. Social capital (norms, networks and trust) is influenced by social structure, institutions, and gender, race, class, and age; all of which can't be overlooked when examining participation. Instead of solely evaluating current participation and participants in conservation programs, this study employs the conceptualization of social capital to examine both conservation and non-conservation related participation in four communities along the northern coast of Bahia, Brazil. Social capital provides a framework for understanding how the structural and cognitive aspects of participation interact, providing a more complete picture of community dynamics and individual interests. By deconstructing non-conservation related participation at the community level to understand how and why people participate, as well as the underlying influences of social structure, this research can be used to better the design and target of sea turtle conservation programs, resulting in greater and more meaningful participation by a more diverse representation of the community.

The aims of this dissertation are to examine the role of gender and social capital in conservation participation and to provide information that can assist sea turtle conservation managers in working with area communities in the municipality of Conde, state of Bahia, Brazil. The broader intent is for the findings from this study to serve as a framework for informing conservation participation. Situated within the literature on conservation and development, the following research questions directed my research:

1) How do social capital and attitudes toward sea turtle conservation affect conservation participation?

2) Can gender differences in sea turtle conservation participation be explained by gender differences in access, attitudes and agency?
3) How can understanding community social structure (including issues of social capital and gender) be used to better engage communities in conservation?

Drawing from feminist political ecology and feminist methodological perspectives within various disciplines, a mixed methods research design was developed. The use of feminist methodology (and gendered methods) works to address the limitations of science as related to objectivity, power differentials, dualisms, and other exclusionary or biased attributes of positivist science (Haraway 2001; Harding 1987, 1991, and 2001; Collins, 1991; Ramazanoglu, 2002). Because many "axes of difference" exist and help form people's experience and understanding of the environment (Rocheleau et al., 1996, p. 10), a mixed methods approach allows for various ways of knowing to be brought together. Furthermore, the collection of quantitative data can draw attention to "issues of need," with qualitative data bringing "voice to these issues" (Hodgkin, 2008), while also alleviating some of the fundamental drawbacks of quantitative and qualitative research (Creswell, 2011). Other principles of feminist research considered include: using a collaborative and interactive approach with participants; analyzing the social, historical and cultural factors influencing the research site; acknowledging the researcher's identity and how that shapes the agenda and findings; taking responsibility for the representation of others in research reports; affecting social change, working across disciplinary boundaries and remaining aware of the limitations and contradictions inherent in research data (Kirsch, 1999; Reinharz, 1992).

The first phase (March–June 2011) involved interviews with key informants and community leaders to identify community assets and services, positive and negative characteristics of the community, formal and informal institutions, and individuals or organizations that are perceived as important. This information was utilized in the development of the household questionnaires and focus groups based on the World Bank Social Capital Assessment Tool (SOCAT) (Krishna & Shrader, 1999). Quantitative data was collected using a household questionnaire to assess the structural (participation and collective action) and cognitive (trust, attitudes, perceptions) aspects of social capital, in addition to attitudes toward conservation in general and sea turtle conservation specifically. Focus group discussions served to clarify and explain results found in the household questionnaire and understand from the participant's perspective motivations, obstacles and attitudes toward participation in both conservation- and non-conservation related activities and groups. All female and all male focus groups highlight gender differences in participation. Feminist political ecology specifically highlights gender as a critical variable that influences resource access and control, interacting with class, race, culture, and ethnicity to shape processes of ecological knowledge, discourse, everyday life, etc. (Rocheleau et al., 1996). Moreover, gendered analysis can increase understanding of community dynamics, social and economic structures and systems, and the values surrounding these (Slocum et al., 1995).

0.0 Organization of the dissertation

The dissertation is presented in three papers. The first, *(Re) Examining Participation: Considerations for improving community engagement in conservation*, reviews the literature on participation and discusses recommendations for reforming the

conceptualization of participation in conservation. Although public participation is increasingly used as a tool for conservation programs, it often remains ill-defined with unclear goals and objectives. Furthermore, when managers and communities have adopted different operational understandings of “participation,” attempts to foster participation are likely to fail at the communication and engagement level. Currently the literature offers insight primarily for co-management situations (see Ostrom et al., 2002; Blaikie, 2006; Brosius et al., 2005; Zulu, 2008); here I present considerations for improving our understanding, application, and assessment of participation in conservation at any level. These include: participant-centered vs. planner-centered participation, clarity and specificity in theory and practice, issues of space, and understanding context. The considerations introduced are derived from my research of sea turtle conservation in four coastal communities in northeastern Brazil and conversations with colleagues that study participation in conservation or work in this area. Portions of the discussion are more applicable to small developing communities that are sites of species conservation and where little to no conflict over harvesting is occurring. However, the overarching ideas could be broadly applied to conservation-related participation throughout the world in order to create more meaningful and inclusive long-term engagement.

The second paper, *Informing community engagement in sea turtle conservation by examining non-conservation participation at the community level: A case study of four coastal communities in northeast Brazil*, analyzes the role of social capital in conservation participation. Community participation in conservation programs is often viewed as a necessity for compliance, management, and awareness; however, our

understanding of participation is limited and long-term engagement remains a challenge. This research takes a different approach to understanding participation in conservation by also examining community participation in non-conservation related activities. Household questionnaires (N=339) were administered in four coastal communities in northeastern Brazil where the national sea turtle conservation project conducts monitoring and outreach. Employing social capital as a conceptual framework, non-conservation community-level participation was measured with five factors, including frequency of participation in civic, community and social activities, group participation, and norms of collective action and cooperation. Confirmatory factor analysis was used to create a second order factor for social capital as well as a factor for measuring attitudes toward sea turtle conservation. Structural equation modeling indicates that both social capital and attitudes toward sea turtle conservation have a positive effect on participation in sea turtle conservation. This finding suggests that general levels of participation and community norms of participation could be just as influential as conservation attitudes when working to engage communities in conservation and requires further examination. By deconstructing participation at the community level this information can be used to better the design and target of conservation programs resulting in greater and more long-term participation.

The third paper, *Beyond fishermen: Gendered aspects of participation in community life and sea turtle conservation*, examines gender differences in conservation and non-conservation participation. This paper aims to contribute to the understanding of gender differences in conservation participation by examining issues of access, attitudes and agency. Using a mixed methods approach, comprised of

questionnaires and focus groups, presents both breadth and depth of gender differences in participation in community life and sea turtle conservation. My findings indicate that gender differences in conservation participation can be partially explained by gender differences in access, attitudes and agency. In contrast, while women face greater structural and agency barriers than men, I found little gender difference in attitudes toward sea turtle conservation. In addition, overall participation (conservation and non-conservation) was low among both men and women, and gender segregated. Low and gender-segregated participation may result from close knit and gendered social networks that decrease an individual's chance at being invited to participate. By deconstructing the motivations behind both conservation and non-conservation participation I provide further insight into how this information can be used to improve conservation participation.

My research contributes to the literature on participation in conservation by conducting a systemic analysis of the social dimensions that directly or indirectly affect participation in sea turtle conservation and presenting a new perspective for conservation that takes into account how people want to participate. The mixed methods approach to understanding participation in conservation emphasizes the equal importance of conservation attitudes and capacity for conservation participation, while also bringing attention to gendered issues of access, attitudes, and agency. Most social science research regarding sea turtle conservation has focused on fishers' (primarily men) attitudes and participation, often ignoring the role that women play in community life. This study provides insight on the role of gender in coastal conservation while also analyzing social capital as a mechanism of conservation participation. Greater

understanding of the human dimensions of sea turtle conservation is needed to evaluate the impacts of conservation projects on conservation and communities (Tambiah, 1999). Furthermore, the findings presented offer important insight regarding considerations for the planning, development and implementation of conservation participation, especially for species conservation.

0.1 Study context

0.1.1 Sea turtle conservation

Known to inhabit primarily tropical and sub-tropical waters, sea turtles can be found in every major ocean in the world. Sea turtles are typically slow growing, with maturity occurring at between 15–50 years or more, highly migratory and cover a wide range of territory. Hatchlings of three species (green, loggerhead and hawksbill) passively drift for possibly several years in what is known as an open ocean (pelagic) stage (Meylan & Meylan, 1999). Most species spend the majority of their adult lives in foraging grounds, often separate from nesting grounds. These characteristics make population estimates challenging, relying primarily on information collected at nesting sites (number of adult females tagged and number of eggs laid) that is later extrapolated (Gerrodette & Taylor, 1999). In addition to the uncertainty involved in estimating sea turtle populations, some researchers have questioned the effectiveness of hatcheries used in many conservation efforts, as well as identified possible negative effects on gene pools (Mrosovsky, 2006). Recent calls for regional assessments of sea turtle populations could help to refine these designations by identifying declining subpopulations, something that could be more useful to conservation managers and the prioritization of funds (Seminoff, 2004). However, this point of view is not widely

accepted because of concerns over increasing and varied anthropogenic pressures throughout the vast migratory ranges of sea turtles, lending support to a more precautionary approach to listing and protection.

The International Union for the Conservation of Nature (IUCN) Red List classifies the leatherback, hawksbill, and green sea turtles as critically endangered and the Kemp's ridley, loggerhead, and olive ridley as endangered owing to five main hazards: (1) fisheries impacts, (2) direct take, (3) coastal development, (4) pollution and pathogens, and (5) global warming (IUCN, 2013; MTSG/IUCN, n.d.).[1] Sea turtles are also protected under the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC),[2] which has 12 signatory states with Brazil as one of nine countries that have ratified the treaty.[3] Campbell and Godfrey (2002) assert that international treaties such as the IAC represent a scalar mismatch that contradicts current conservation thinking related to community-based conservation and sustainable use at the local level. While the IAC may present an opportunity to address global threats to sea turtles like commercial fishing and global warming, it may create additional power differentials and further marginalize local communities in the decision-making process regarding sea turtle conservation.

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[1] http://www.iucn-mtsg.org/about.shtml

[2] The objective of the IAC is "to promote the protection, conservation and recovery of sea turtle populations and of the habitats on which they depend, based on the best available scientific evidence, taking into account the environmental, socioeconomic and cultural characteristics of the Parties." http://www.seaturtle.org/iac/convention.shtml

[3] Signatories of the IAC: United States, Venezuela, Costa Rica, Nicaragua, Brazil, Peru, Mexico, the Netherlands, Honduras, Ecuador, Uruguay, and Belize. Only nine countries have ratified the IAC: Venezuela, Peru, Brazil, Costa Rica, Ecuador, Mexico, the United States, Honduras, and the Netherlands.

Despite legislation banning the capture of certain species of sea turtles and the regulation of harvests dating back to 1967, little was known (scientifically) regarding the extent of sea turtle habitation in Brazil until the early 1980s when a two-year survey of the coastline discovered that five[4] of the seven known species of marine turtles nest or forage along the Brazilian coastline (Marcovaldi & Marcovaldi, 1999). This discovery led to the founding of Projeto-TAMAR[5] (from here forward referred to as TAMAR), the Brazilian national sea turtle conservation program, and full legal protection for all five species making it illegal to hunt sea turtles for their meat, shell or eggs (Marcovaldi & Marcovaldi, 1999). Today the project manages twenty-two research stations in nine states along the Brazilian coastline, with one seasonal and four year-round bases in the state of Bahia. TAMAR is jointly administered by the Government of Brazil (IBAMA, Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis and ICMBIO, Instituto Chico Mendes de Conservação da Biodiversidade) and Fundação Pró-TAMAR (a non-governmental organization, NGO) (Marcovaldi & Marcovaldi, 1999). The program is officially sponsored by Petrobras, the petroleum company in Brazil, and has partnered with other Brazilian NGOs including Fundação Brasiliera para a Conservação da Natureza (Brazilian Foundation for Nature Conservation) and the Fundação Garcia D'Avila. The foundation Pró-TAMAR contributes approximately 60% of the budget and manages contributions from private and public organizations in Brazil,

[4] These species are: green sea turtle (*tartaruga-verde* or *tartaruga-aruanã*), loggerhead (*tartaruga-cabeçuda*), hawksbill (*tartaruga-de-pente*), olive ridley (*tartaruga-pequena* or *tartaruga-comum*), and the leatherback (*tartaruga-de-couro* or *tartaruga-gigante*).

[5] TAMAR is an acronym for sea turtle in Portuguese, created using the first two letters of the Portuguese word for turtle, *TArtaruga*, and the first three letters of the Portuguese word for marine, *MARinha*.

financing from the European Economic Union and the Inter-American Bank for Development, as well as the income generated through tourism, merchandise sales, visitor center fees, and other activities (Marcovaldi et al., 2005; Marcovaldi & Marcovaldi, 1999). The government arm (IBAMA) of TAMAR is primarily responsible for biological research and regulation enforcement, while the NGO arm (Fundação Pró-TAMAR) manages community-based programs, education and outreach, and tourism-related activities. However, many employees see these lines as blurred and often work simultaneously on elements from both.[6]

Sea turtles are also charismatic creatures that can serve as powerful symbols for fostering conservation awareness independent of biological information (Frazier, 2005). Since their inception in 1980, TAMAR has released more than 15 million turtle hatchlings into the ocean, with 1,287,265 hatchlings in 2009-2010 and 1,008,706 in 2010-2011—37% and 49%, respectively, came from the state of Bahia (Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas [Fundação Pró TAMAR], 2010 & 2011). An analysis of 15 years of monitoring data from 1991-2006 revealed an increase of 7 times the number of hawksbill nests, a species that primarily nests along the northern coast of Bahia (TAMAR website, 2013). Other species also showed an increase of 5 to 10 times the number of nests over a 10- or 15-year period depending on the species. TAMAR attributes this success to increased monitoring, support from communities, and heightened awareness of sea turtle conservation by fishers and beachgoers. A select number of local fishers and community members receive a salary to monitor and survey turtle nests, as well as transport eggs to be

[6] Information acquired through personal communication with TAMAR staff in Praia do Forte, BA July 2009.

incubated in one of the open-air hatcheries. TAMAR also engages the public nationwide through their various visitor's centers, website, DVDs, books, music CDs, and expositions in malls, schools, and other venues. At the community level, TAMAR conducts various activities surrounding: *sensibilização* and environmental education, presentations and expositions, income and employment generation programs, activities to promote social and cultural valorization, and providing financial or other support to community associations or activities. In 2010 and 2011, TAMAR staff conducted or participated in 287/385 presentations and 128/126 expositions reaching 13,014/19,847 and 260,404/275,039 people respectively (Fundação Pró TAMAR, 2010 & 2011).[7]

0.1.2 Socio-demographics of Bahia and Northeastern Brazil

By land area Bahia is the largest (564,692,669 km^2) of the nine states[8] that comprise the Northeastern region of Brazil, accounting for 27% of the region's population (14,080,654). Together, the region constitutes roughly one-third of the total population of Brazil and less than 20% of the total land area (Instituto Brasileiro de Geografia e Estatística [IBGE], n.d.). Originally populated by indigenous peoples, this region was the first point of contact for the Portuguese and where colonization began in the 1500s. The city of Salvador, Bahia, became the first colonial seat of government and a major seaport at the core of the African slave trade and sugar industry. Although it was once at the center of economic activity, today the Northeast region contains some of the poorest areas in the country (Thomas, 2006). Livestock and fishing in Bahia

[7] The increase from 2010 to 2011 is most likely due to celebrations in conjunction with TAMAR's 30th anniversary.

[8] Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe

account for 26% of the region's economy, while tourism is the top contributor at 34% (IBGE, n.d.). Literacy rates in Bahia are among the lowest in the region, 18.5%, despite the fact that 58% of women and 41.2% of men have completed 12 or more years of schooling. The interior is primarily rural, plagued by water scarcity, environmental degradation, deep inequalities in political power and patterns of landholding, and lacks basic infrastructure and services in many places (Thomas, 2006). Many of the region's inhabitants migrate to major metropolitan areas such as São Paulo or Rio de Janeiro, or others within the region. The majority of the population in the Northeast (71%) lives in metropolitan areas located on the coast, such as Salvador, Recife, and Fortaleza (IGBE, n.d.).

In terms of conservation, Brazil is well known for its rich biodiversity in areas such as the Amazon, Pantanal, Caatinga, Cerrado and Atlantic Forest. Classified as one of the world's most threatened ecosystems and a UNESCO Biosphere Reserve, the highly fragmented Atlantic Forest (Mata Atlântica) extends along the Brazilian coastline across a variety of landscapes including large urban areas (Thomas, 2006). Remnants of the Atlantic Forest in Bahia are more concentrated along the southern coastline of the state than in the north. During the 80s and 90s several protected areas were created; today there are 478 federal and state protected areas (37,019,697 ha) and 436 sustainable-use areas (74,592,691 ha) (Rylands & Brandon, 2005). With 4,491 km of coastline, Brazil also manages 62 marine and coastal federally protected areas and an unknown number of state and municipal areas (Gerhardinger et al., 2010). Protected areas have many distinctions based on the level of protection and use (scientific use only, sustainable-use, extraction, etc.). The state of Bahia has 41 state-managed

protected areas, including sustainable-use protected areas (APAs) that are meant to protect biological and cultural diversity, quality of life for current human inhabitants, and manage the sustainable use of natural resources (Secretaria do Meio Ambiente da Bahia, 2000). Although Brazil has numerous protected areas, the effectiveness, management, and resources of these areas have been found to be lacking or even non-existent (Gerhardinger et al., 2010; Rylands & Brandon, 2005; Silva, 2005).

Figure 0.1 Map of Brazil with state of Bahia highlighted and municipality of Conde enlarged.
(Adapted from Open Clip Art Library[9] and Wikimedia Commons[10] images)

[9] http://flagartist.com/art/svg/flags/brazil-labelled-map-black-white-line-flag-flagartist-com-flag-svg-youtube-facebook-linkedin-twitter-google/
[10] http://commons.wikimedia.org/wiki/File:Brazil_Bahia_location_map.svg

0.1.3 Description of study area

Data was collected between April and November 2011 in the towns of Sítio do Conde, Poças, Siribinha and Barra do Itariri, located in the state of Bahia (BA) on Brazil's northeastern coast (Figure 0.1). Sítio do Conde is less frequented by tourists than other TAMAR sites such as Praia do Forte, but is expanding to attract tourism and other economic investments. TAMAR established a research station for sea turtle conservation in Sítio do Conde in October of 1991, monitoring 45 km of beaches.[11] The area provides nesting for hawksbill, loggerhead, and olive ridley sea turtles (TAMAR, n.d.); 70% of all turtle nests along the Brazilian coast occur on the beaches of the state of Bahia (2003-2004 TAMAR annual report). In addition, the northern coast of Bahia is one of the main feeding areas for green sea (*chelonia mydas*) turtles along the Brazilian coast. Other communities in Bahia that have TAMAR stations were excluded as possible research sites based on the following: Praia do Forte and Arembepe have been heavily studied and previous studies indicate that fishing only occurs recreationally with tourism supporting the local economy; Costa do Sauípe is the site of the largest tourism complex in Latin America including several all-inclusive resorts, making it an expensive research site; and finally the research station in Mangue Seco is only open

[11] The TAMAR research base in Sítio do Conde also manages what is considered a 'sub-base' in Mangue Seco which is only staffed by TAMAR during the reproductive season (October–March). This adds an additional 41 km of beach, resulting in a total of 85 km for the TAMAR research station in Sítio do Conde.

during the nesting season, is the least urbanized of all the locations, and has the shortest history of TAMAR presence.[12]

Located in the municipality of Conde (population 23,600), the four communities in this study are situated along the northeastern coast of Bahia, an area known as the 'coconut coast' where sugar cane and coconut plantations still exist in large landholdings (IGBE, 2010). Farming and fishing still provide a significant source of income for many residents. The majority of fishing that occurs today is considered artisanal, or small scale, through the use of small craft of 10 to 15 meters, and focuses on lobster, shrimp and pelagic and demersal[13] fish (TAMAR, 2004). Crab, in particular, is heavily harvested during the summer months and is a favorite among beach tourists. While fishing is not the primary source of income for the majority of people, it can often be an important food source with many families supplementing their income or diets by fishing throughout the year.

The region's extensive beaches, tropical climate and accessibility from urban areas make it a common tourist destination for weekend and seasonal tourists. With the construction of the Linha Verde highway in 1990 the region is easily reached and is 180 km north of Salvador, the state capital of Bahia, with a population of 2.7 million (IBGE, 2010). This northern coastal area of Bahia maintains a tropical climate year-round with temperatures varying from 23°C and 36°C. Surrounded by water and sweeping sand

[12] TAMAR also stations interns there in the summer to coordinate educational activities with the local school and work with the local monitoring staff. One of the long-standing TAMAR beach monitors is from this town.

[13] Demersal fish are those that live and feed close to or on the bottom of the ocean or lakes, such as grouper and catfish, while pelagic fish are those that live and feed in the water column, including tuna and sharks.

dunes, the communities are bounded to the east by the ocean, the north and south by rivers, and the west by what is known by locals as the *lagoa*, or lagoon. The region is also part of a sustainable-use protected area (APA do Litoral Norte) that engages local, state and federal governments to address increasing urbanization and development, and protect the coastal ecosystem (Secretaria do Meio Ambiente da Bahia, 1992).[14]

For the area monitored by the Sítio do Conde base, the number of nests was on the rise with 1510 nests in 2009-2010 and 1753 nests in 2010-2011, a 16% increase (Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas [Fundação Pró TAMAR], 2010 & 2011). Seasonally, TAMAR employs one person each in the communities of Barra do Itarirí, Poças, and Siribinha for monitoring, and two people in Sítio do Conde to conduct year-round monitoring for the beaches of all four communities. The primary forms of community engagement employed by the research base in Sítio do Conde include informational presentations with schools and local fishers' groups, public release of sea turtle hatchlings on local beaches, and the distribution of informational posters, magazines and other materials to local restaurants and hotels. Table 0.1 presents information compiled from reporting documents representing the number of activities and participants over a five-year period from 2008 to 2012. For example, staff conducted or organized[15] 36 school presentations for approximately 2511 primary and secondary local school children. More people were

[14] http://www.meioambiente.ba.gov.br/conteudo.aspx?s=APALITOR&p=APAAPA

[15] Some presentations to schools were organized through an educational non-profit organization in Brazil, Passa Tempo, that travels the country presenting educational skits on various themes to school children. TAMAR solicited their services to conduct environmentally themed skits and activities.

reached through the release of hatchlings or rehabilitated sea turtles on the beach, with over 10,000 people participating in these events. However, it is important to note that these occur primarily throughout the reproductive season, also the tourist season, meaning that participants in this type of activity are more likely to be tourists than local residents. In comparison to the national data presented above, activities conducted by the research base in Sítio do Conde represent 4% of all participants nationally.

Table 0.1 Number of activities and participants for the region monitored by Sítio do Conde

	2008	2009	2010	2011	2012	Total # by activity
# Hatchling or rehabilitated sea turtle released	67 (1924)	104 (3050)	28 (1129)	32 (2275)	16 (2306)	247 (10684)
# School Presentations	8 (810)	6 (326)	4 (189)	11 (919)	7 (267)	36 (2511)
# Special Presentations	14 (322)	18 (83)	2 (71)	5 (178)	4 (730)	43 (1384)
# Expositions	4 (2800)	1 (600)	1 (11)	2 (330)	2 (280)	10 (4021)
# Base Visits	15 (35)	9 (30)	1 (4)	3 (12)	0 (0)	28 (81)
# Beach Clean-ups	1 (60)	1 (40)	1 (30)	1 (60)	4 (210)	8 (400)
Total by year	109 (5951)	139 (4129)	37 (1434)	55 (3774)	33 (3793)	

# of activities (# of participants)
**Information compiled from reporting documents supplied by TAMAR base staff. Because of discrepancies within the documents, these numbers represent approximations only.

REFERENCES

REFERENCES

Blaikie, P. (2006). Is small really beautiful? Community-based natural resource management in Malawi and Botswana. *World Development*. *34*(11), 1942–1957.

Brosius, J. P., Tsing Lowenhaupt, A., & Zerner, C. (2005). *Communities and conservation: Histories and politics of community-based natural resource management*. AltaMira Press: Walnut Creek, CA.

Campbell, J., & Godfrey, M. (2002). Community-based conservation via global legislation? Limitations of the Inter-American Convention for the Protection and Conservation of Sea Turtles. *Journal of International Wildlife Law and Policy. 5,* 121–143.

Collins, P. H. (1991). Learning from the outsider within: The sociological significance of black feminist thought. In M. M. Fonow and J. A. Cook (eds.), *Beyond Methodology: Feminist Scholarship as Lived Research.* pp. 35–59. Bloomington and Indianapolis, IN: Indiana University Press.

Creswell, J. W. (2011). *Designing and conducting mixed methods research* (2nd ed.). Los Angeles: SAGE Publications.

Frazier, J. (2005). Marine turtles: The role of flagship species in interactions between people and sea. *MAST 41.* (3), 5–38.

Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas, (Pró TAMAR). (2011). *Relatório de Atividades 2011*.

Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas, (Pró TAMAR). (2010). *Relatório de Atividades 2010*.

Gerhardinger, L. C., Godoy, E. A. S., Jones, P. J. S., Sales, G., & Ferreira, B. P. (2011). Marine Protected Dramas: The Flaws of the Brazilian National System of Marine Protected Areas. *Environmental Management*. *47*(4), 630–643. doi:10.1007/s00267-010-9554-7

Gerrodette, T., Taylor, B., Eckert, K., Bjorndal, F., & Washington, D. (1999). Estimating population size. In K. L. Abreu Grobois and M. Donnelly (eds.), *Research and management techniques for the conservation of sea turtles.* pp. 67–71, IUCNTurtle Specialist Group.

Haraway, D. (2001). Situated knowledges: The science question in feminism and the privilege of partial perspective. In M. Lederman and I. Bartsch (eds.), *The Gender and Science Reader*. pp. 169-188. London and New York: Routledge.

Harding, S. (2001). Feminist standpoint epistemology. In M. Lederman and I. Bartsch (eds.), *The Gender and Science Reader*. pp. 145-168. London and New York: Routledge.

Harding, S. (1991). Feminist Empiricism. In *Whose Science, Whose Knowledge*. pp. 111-118. Ithaca, NY: Cornell University Press.

Harding, S. (1987). Introduction: Is there a feminist method? In S. Harding (ed.), *Feminism & Methodology*. Bloomington, IN: Indiana University Press.

Hodgkin, S. (2008). Telling It All: A Story of Women's Social Capital Using a Mixed Methods Approach. *Journal of Mixed Methods Research*. *2*(4), 296–316.

Instituto Brasileiro de Geografia e Estatística (IBGE). (n.d.). Retrieved from www.igbegovbrestadosat

Instituto Brasileiro de Geografia e Estatística (IBGE), (2010). Censo Demográfico 2010. Website http://www.ibge.gov.br/cidadesat/topwindow.htm?1, last accessed 03 June 2013.

Kirsch, Gesa E. (1999). *Ethical dilemmas in feminist research*. pp. 4-5. Albany, NY: State University of New York Press.

Krishna, A., & Shrader, E. (1999). Social capital assessment tool. *Prepared for the Conference on Social Capital and Poverty Bank, June 22–24.*

Marcovaldi, M. & Marcovaldi, G. (1999). Marine turtles of Brazil: The history and structure of IBAMA. *Biological Conservation*. 91, 35–41.

Marcovaldi, M., Patiri, V., & Thomé, J. (2005). IBAMA: Twenty-five years protecting Brazilian sea turtles through a community-based conservation programme. *MAST.* 3(2) and 4(1): 39–62.

Marine Turtle Specialist Group/World Conservation Union (MTSG/IUCN), (n.d.). website, www.iucn-mtsg.org , last accessed 05 August 2013.

Meylan, A., Meylan, P., Eckert, K., Bjorndal, F., & Washington, D. (1999). Introduction to the evolution, life history, and biology of sea turtles. In K. L. Abreu Grobois and M. Donnelly (eds.), *Research and management techniques for the conservation of sea turtles.* pp. 3–5. IUCN Turtle Specialist Group.

Mrosovsky, N. (2006). Distorting gene pools by conservation: Assessing the case of doomed turtle eggs. *Environmental management*. *38*(4), 523–31.

Ostrom, E., Dietz, T., Nives, D., Stern, P. Stonich, S. & Weber, E. U. (Eds.) (2002) *The drama of the commons*. Committee on the Human Dimensions of Global Change, National Research Council (U.S.), Washington, DC: National Academy Press.

Projeto, T. (n.d.). IBAMA. Retrieved from www.projetotamar.org.br

Projeto TAMAR-IBAMA. (2004). Reporte annual 2004, Base de Sítio do Conde, Bahia, Brazil.

Ramazanoglu, C. & Holland, J. (2002). *Feminist methodology: Challenges and choices*. Thousand Oaks, CA: Sage Publications.

Reinharz, S. (1992). *Feminist methods In social research.* pp. 76-94, pp.197-213, and 240-269. London & New York: Oxford University Press.

Rocheleau, D., Thomas-Slayter, B., & Wangari, E. (1996). *Feminist Political Ecology: Global Issues and Local Experiences.* New York: Routledge.

Rylands, A. B., & Brandon, K. (2005). Brazilian Protected Areas. *Conservation Biology*. *19*(3), 612–618. doi:10.1111/j.1523-1739.2005.00711.x

Secretaria do Meio Ambiente, Estado da Bahia, Brazil. (1992). APA Litoral Norte do Estado da Bahia, Decreto Estadual n° 1.046/92 de 17 de Março de 1992, http://www.meioambiente.ba.gov.br/conteudo.aspx?s=APALITOR&p=APAAPA, last accessed 03 June 2013.

Secretaria do Meio Ambiente, Estado da Bahia, Brazil. (2000). Website http://www.meioambiente.ba.gov.br/conteudo.aspx?s=APALITOR&p=APAAPA, last accessed 05 August 2013.

Silva, M. (2005). The Brazilian Protected Areas Program. *Conservation Biology*. *19*(3), 608–611. doi:10.1111/j.1523-1739.2005.00707.x

Slocum, R., Wichhart, L., Rocheleau, D., & Thomas-Slayter, B. (1995). *Power, process and participation: Tools for change.* London: Intermediate Technology Publications.

Tambiah, C., Kalb, H., & Wibbels, T. (1999). Community participation in sea turtle conservation: Moving beyond buzzwords to implementation. In *Compilers Proceedings of the Nineteenth Annual Symposium on Sea Turtle Biology and Conservation.* pp. 59–61. *US Dept. of Commerce Memo NMFS-SEFSC-443*.

Thomas, V. (2006). From inside Brazil: Development in a land of contrasts. The International Bank for Reconstruction and Development / The World Bank: Washington, DC and Stanford University Press: Palo Alto, CA.

World Conservation Union (IUCN). IUCN 2013. *The IUCN Red List of Threatened Species. Version 2013.1*. http://www.iucnredlist.org, last accessed 05 August 2013.

Zulu, L. C. (2008). Community forest management in Southern Malawi: Solution or part of the problem? *Society and Natural Resources*. *21*(8), 687–703.

CHAPTER 1

(RE) EXAMINING PARTICIPATION: CONSIDERATIONS FOR IMPROVING COMMUNITY ENGAGEMENT IN CONSERVATION

1. Introduction

Participation is considered a key component in addressing many of the problems in today's world. However, participation means many different things to many different people, and it is easy to be confused by the extensive terminology that is often used interchangeably without providing any clear distinction. Participation in conservation can range from outreach and awareness programs to co-management, and everything in between. While the common-pool resource literature offers insight for co-management situations (see Blaikie, 2006; Brosius et al., 2005; Ostrom et al., 2002; Zulu, 2008), many conservation issues do not lend themselves to a co-management arrangement where decision-making will be decentralized and shared among local institutions and actors. Indeed, participation has come to be synonymous with anything that involves people (Cornwall, 2011). A further examination is needed of what constitutes participation and who decides. What counts as participation, what doesn't, and how is it counted? Most importantly, why does this matter? This article contributes to the discussion by presenting considerations for improving our understanding and application of participation in conservation outside of the co-management realm, allowing for the inclusion of a broader array of conservation issues. The considerations introduced here are derived from my experiences conducting research on sea turtle conservation (managed by the national sea turtle conservation program, Projeto

TAMAR) in four coastal communities in northeastern Brazil and conversations with colleagues that study participation in conservation or work in this area. As a result, portions of the discussion are more applicable to small developing communities that are sites of species conservation and where little to no conflict or over harvesting is occurring. Nonetheless, the theoretical implications may be broadly transferrable to conservation-related participation throughout the world.

1.1 Participation in conservation: Past to present

Participatory conservation in the developing world has been heavily influenced by Western ideologies and the evolution of development theory and praxis (Midgley, 2011). Proponents of the community development movement of the 1950s and 1960s viewed participation as a requirement of citizenship or popular agency, with the level of engagement at the community-level rooted in the idea of a small, cohesive, egalitarian, and self-sufficient group (Hickey & Mohan, 2004; Midgley, 2011). This conceptualization of a people-managed development paralleled that of decentralization, or the reversal of power or management from hierarchical bureaucracies (often industrialized countries) to local communities in the developing world (Brosius et al., 2005; Martinussen, 1997). The introduction of participatory or community-based development as a means of reaching project goals, building capacity and empowering local people to help themselves spread quickly throughout the development community and was adopted by the United Nations and the American aid program (Midgley, 2011). It was also readily adopted by the conservation community with several international conferences and documents placing participation in both conservation and development at the top of priority lists, including the 1980 World Conservation Strategy (WCS), 1982 World Parks

Congress, 1991 Second World Conservation Strategy, and 1992 'Earth Summit' in Rio (United Nations Conference on Environment and Development) (Adams, 2001; Oates, 1999; Brosius et al., 2005).

One result has been a plethora of terms including, but not limited to, community-based conservation (CBC), community-based natural resource management (CBNRM), participatory resource management (PRM), and community natural resource management (CNRM). Although a few general definitions exist, these terms are often used interchangeably. Campbell and Vainio-Mattila (2003) provide a distinction between CBC and CBNRM based on the resource involved, with CBC primarily involving wildlife or biodiversity conservation (often within parks or protected areas) and CBNRM involving the management of resources such as water, forests, and soils (see Brosius et al., 2005; Campbell & Vainio-Mattila, 2003; Kellert et al., 2000; Zulu, 2008). However, regardless of the resource in question, CBC and CBNRM are supposed to represent contextually relevant small-scale solutions established by the communities themselves (Brosius et al., 2005). Although many of these projects are considered 'bottom up,' they are often influenced or directed by international or national policy, funding, and scientific findings—as is the case in sea turtle and other endangered species conservation (Adams, 2001; Brosius et al., 2005; Campbell, 2007; Martinussen, 1997; Ribot, 2002). This contradicts the fundamental principle of participation in the development literature that focuses on grassroots collective action and empowerment in order to increase involvement in decision-making.

Although community-based projects theoretically have the potential to increase transparency, promote democracy, empowerment, and equity, and even reduce conflict

and corruption, they often fall short by failing to address, among other issues, power and politics (Agrawal & Gibson, 1999; Campbell & Vainio-Marttila, 2003; Kellert et al., 2000; Martinussen, 1997; Ribot, 2002; Zulu, 2008). Instead, participation has become more of a technical approach to development and conservation, attempting to depoliticize an explicitly political process (Hickey & Mohan, 2004; Cornwall, 2008). Studies show a myriad of unintended consequences that can favor certain members of a community over others as a result of power dynamics, gender, politics, and economics at the local level (Agrawal & Gibson, 1999; Campbell & Vainio-Marttila, 2003; Cooke & Kothari, 2001; Kellert et al., 2000; Martinussen, 1997; Ribot, 2002). Part of the problem is the variable definition of community, based on geographical proximity, territorial, cultural or religious affiliation—all of which assume homogeneity (Agrawal & Gibson, 1999). This assumption ignores the social dynamics in society that may favor certain members of a community over another based on gender, religious affiliation, familial ties, etc. Even famous CBCs such as Zimbabwe's CAMPFIRE, and other similar projects in Africa, have been plagued by corruption benefiting primarily local elites (Chan et al., 2007). Moreover, some feel that biodiversity needs to be protected for its own intrinsic value without regard to the needs of those dependent on the resource in question (Oates, 1999). Therefore, it is important to acknowledge that participation is not a panacea and that in order for it to be successful all parties involved should have some vested interest in meeting the ideals and objectives put forth.

Nonetheless, participation in conservation has provided an opportunity for conservation programs to make up for past mistakes that marginalized local peoples and often led to conflict. In North America participation has become a regular

component of policy making in natural resources, focusing primarily on civic engagement, with efforts to involve stakeholders in planning and management often encouraged by state and national regulatory agencies (Chase et al., 2004; Reed, 2008; Wagenet & Pfeffer, 2007). While there are some similarities to participation around the world, the inclusion of social development objectives in conservation initiatives appears to occur more frequently in developing countries. Commonly referred to as integrated conservation and development programs (ICDP), or *projetos socioambientais* (socio-environmental projects) in Brazil, these programs go "beyond conservation to include health, literacy, skills training, and other projects that attempt to improve the social conditions of community members" (Tambiah, 1999, p. 60). Although it may be difficult for conservation programs, especially those dealing with endangered species, to involve communities in conservation decision-making, it is still possible for programs to address issues related to social development in addition to conservation. The spectrum of participation, as I will discuss, offers opportunities for community engagement at many levels and under various circumstances as long as practitioners are careful to take into account the context (social, political, historical and ecological) and are clear about the goals and objectives of the form of participation being used.

1.2 Participation typologies

Participation can be categorized in several different ways based on who is involved (stakeholders or general public), how they are involved (education, consultation, planning, monitoring, decision-making, research, management and enforcement), and why (normative or pragmatic). However, these categorizations are often mixed together, and participation is commonly considered to exist on a continuum

from passive education imparted by an expert authority to the complete devolution of decision-making power to communities. Across disciplines this largely originated with Arnstein's 1969 *Ladder of Citizen Participation*, providing the backbone for the majority of the participation literature even today. However, this hierarchical view of participation, also considered as means vs. ends (Campbell & Vainio-Marttila, 2003), dismisses the importance of context, which can influence the way in which people participate and their capacity for participation (Reed, 2008).

The International Association for Public Participation (http://iap2.org) categorizes participation into five simple forms: inform, consult, involve, collaborate, and empower. These forms range from pragmatic to normative based on how people are involved. In the development literature, Pretty (1995) expands upon these categories and addresses some of the rationale for participation on the side of both the participants and the implementing agency (Figure 1.1). Bina Agarwal (2001) presents a very similar typology of participation including: nominal, passive, consultative, activity-specific, active, and interactive. The addition of 'activity-specific participation,' which she describes as "being asked to (or volunteering to) undertake specific tasks" (p. 1624), represents a common form of participation available in species conservation along with passive participation. These typologies from the development literature are very similar to contemporary conceptualizations of stakeholder engagement in wildlife management in the United States. Figure 1.2, adapted from Chase et al. (2000), depicts a continuum of participation indicating the amount of responsibility and decision-making power of the two main actors, in this case stakeholders and wildlife managers, who can also be viewed as community members and conservation managers. All of these typologies

indicate the various levels and forms of participation but do not highlight the fact that these may occur concurrently or at different stages of a program. Participation in conservation is not limited to only one form or level of participation, nor does it always occur in a simple progression.

Typology	Characteristics of each type
(1) Passive participation:	people participate by being told what has been decided or has already happened *(such as education and outreach)*
(2) Consultative participation:	people participate by being asked and answering questions, with no sharing in decision-making
(3) Bought participation:	people participate in return for food, cash, or other material incentives *(sometimes known as T-shirt conservation)*
(4) Functional participation:	participation is a means to meet external goals and people form groups to meet predetermined objectives
(5) Interactive participation:	people participate in joint analysis, development of action plans and formation or strengthening of local groups or institutions
(6) Self-mobilization:	people participate by taking initiative independently and retain control over how resources are used

Table 1.1 A typology of participation: How people participate in development programs and projects

(recreated from Pretty (1995) - italics indicates my addition to the original.)

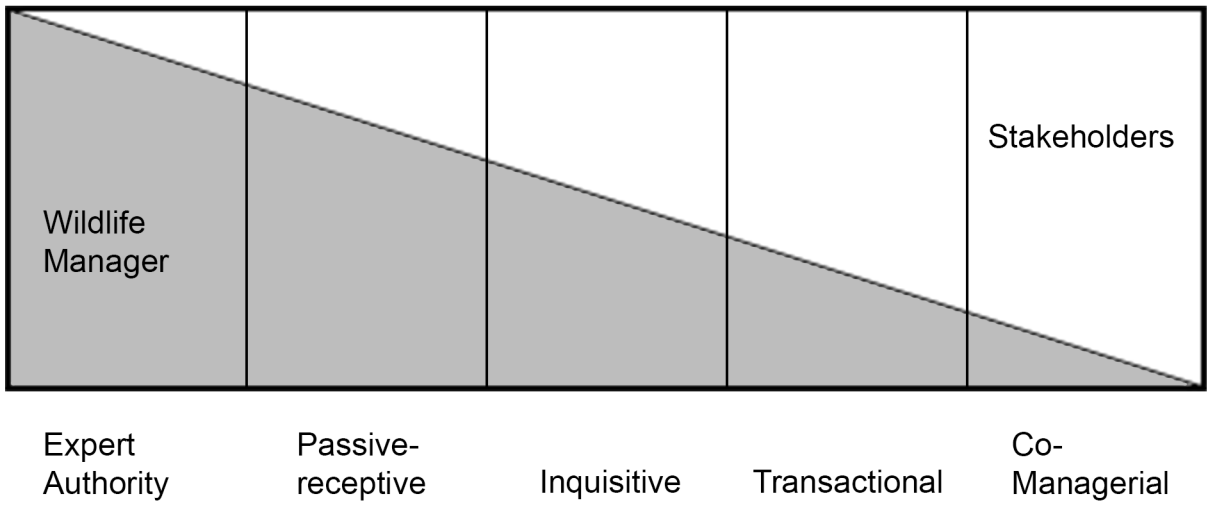


Figure 1.1 Approaches to stakeholder engagement (Chase et al., 2000)

In the case of species conservation, the types of participation most often employed fall within the realm of passive and functional, or expert authority and inquisitive (based on the typologies presented). This is often the result of international or national policy, funding, and scientific findings that direct conservation actions, limiting the level of involvement in decision-making by local residents (Adams, 2001; Brosius et al., 2005; Campbell, 2007; Martinussen, 1997; Ribot, 2002). In these situations, conservation efforts to involve local communities may rely on education and economics, commonly in the form of presentations at schools or to community groups, employment in monitoring or ecotourism, or other financial incentives. All of these can be considered passive forms of participation (Pretty & Smith, 2004) owing to the fact that they are one-way exchanges that don't require significant dialogue between conservation managers and local communities that might affect conservation-related decisions or the way in which communities are participating. While passive, consultative, bought, and functional participation may conjure a negative image, they represent the reality for many

conservation programs (see Agarwal, 2001; Blaikie, 2006; Kellert et al., 2000; Michener, 1998). However, participation that is not co-managerial does not need to be passive, bought, or simply functional. The following paragraphs provide considerations that, if taken into account, could help reform the ways in which we think about participation and thus improve the ways in which the conservation community engages people in conservation in more meaningful and lasting ways.

1.3 Considerations for improving community engagement in species conservation

1.3.1 Participant-centered vs. planner-centered participation

People-oriented approaches to conservation simultaneously view local communities as both problem and solution to natural resource issues. However, people are often not at the center of conservation-related participation. Despite the fact that conservation inherently involves people, participatory programs are sometimes planned with the conservation goal in mind with no input from potential participants on what they feel are vital conservation issues or how they want to participate. Because conservation projects already have established goals and objectives based on their governmental or organizational mandate, the type of participation strategy or activities may also already be established. The conceptualization of participation as a means to project implementation, instead of as a means to achieving long-term meaningful engagement presents a significant problem for the future of conservation (Blaikie, 2006; Zulu, 2008). Participation could be more successful if the participants themselves were more involved in deciding how they wanted to participate, leading to a more participant-

centered form of participation than planner-centered (Michener, 1998; Russell & Dobson, 2011; Walker et al., 2006).

The typologies of participation demonstrate the varying conceptualization of participation, even among academics. It should be no surprise then that participation is often also defined and understood differently among participants and conservation managers.[16] This fact was made plain to me during the pre-testing of questionnaires as respondents were asked whether or not they had ever participated in sea turtle conservation. Some people were not sure whether they had or had not and were quick to say no until some examples of typical activities offered were mentioned.[17] The question was then split into a series of questions that first asked about their familiarity with the sea turtle conservation project (Projeto TAMAR, hereafter referred to only as TAMAR), then their participation, and finally what type of activity. Even still, some people would respond that they hadn't ever participated but attended a release of hatchlings, or that they were temporarily employed by the project, or had stopped by the office once to notify them of a dead turtle on the beach. Respondents perceived all of these activities as forms of participation, but not all of them fell under the categories used to quantify community engagement by the sea turtle conservation project.

[16] To be clear, I am referring to what these actors consider to be participation or how they see themselves participating, as opposed to how they perceive their own participation or the process (see…Cheng & Mattor, 2006; Gelcich et al., 2005; Pita et al., 2010; Robertson & Lawes, 2005).

[17] This also could have been a language issue, as I used the direct translation for the word participation from English to Portuguese. However, further discussions did not reveal another word that would have been more suitable.

The definition of participation was even further expanded during a focus group of local fishers. The general consensus at first was that *palestras* or informational presentations were how they wanted to participate, until one fisher asserted that being a good steward by following the rules, not polluting, and encouraging others to do the same was how he thought fishers should participate.[18] This challenges many ideas about participation, especially when it comes to reporting participation in grant reports and newsletters. If a person at sea doesn't litter and no one is there to see it, does it count? In addition, this raises issues of individual responsibility and collective action. In reality, collective action does not exist without individual responsibility. However, individual responsibility can exist without collective action while still contributing to the collective good. How does participation fit into this equation? Does participation need to involve some element of collective action? How do we evaluate individual responsibility such as stewardship when it occurs outside of a sponsored conservation activity? Reaching that level leads us back to the ladder of participation and toward the concepts of empowerment and transformation.

These examples illustrate the difference in perception of participation between conservation managers (or participation planners) and potential participants. This disparity not only limits what counts as participation, but also considers how people engage in conservation as an important component. Understanding how people in a community perceive participation and how they want to participate (i.e., participant-

[18] Research in Australia demonstrated a similar reaction from fishers who, although were not complying with go-slow areas, felt they were already minimizing their interactions with marine wildlife in other ways and therefore participating in conservation efforts. Non-published research presented by Steve Sutton and Renae Tobin at the Human Dimensions of Wildlife Conference September 2012.

centered) could be very useful in planning conservation-related participation. In any community people participate in various groups and activities, including religious services, birthday parties, cultural and sporting events, trade associations, etc. Through my research in four small coastal communities, I learned that participation in these groups is also an extremely social process. Members of groups were often related or have known each other for years. Even the fishers' association held barbecues and other social events for its membership, separate from or in conjunction with business meetings. Information collected from focus groups indicated an interest in conservation programs that have more of a social emphasis to them, especially family oriented. Women in particular lack opportunities to get out of the house and saw conservation programming that was family oriented as a way to do that while also entertaining their family at little or no cost. Both men and women valued programs that engaged youth and felt that more programs were needed to "keep them off the streets" and from getting involved in drugs or crime. Understanding how people want to participate, what types of participation they value, and what they expect to receive through participation could be very valuable information for conservation managers and is the first step to a more participant-centered participation.

1.3.2 Bringing clarity and specificity to participation in theory and practice

Both research and practice have been plagued by ambiguity in regards to conservation-related participation. This is particularly evident with passive or nominal forms of participation such as education, outreach, and awareness. In order to achieve the goals set out for participation, you first need to understand your long-term goals and short-term objectives. Most importantly you need to be realistic. Conservation

managers/planners need to communicate more clearly what participants are being asked to participate in, what is expected of them, the intended outcome, and who is being included or excluded from such participation (Cornwall, 2008). Ultimately, this should help to tie participation more closely to conservation objectives, the community, and ideally lead to more long-lasting results.

A common goal among conservation projects is to increase awareness of the conservation issue at hand or what Heberlein (2012) calls the 'cognitive fix.' This approach often involves educational programs, materials, messaging, etc. aimed at children and particular stakeholders (fishers, hunters, etc.). However, giving a presentation is a nominal form of participation that is very limited and will result in the realization of nothing without clarity, specificity, and continued follow-up. While raising awareness is important, it often does not lead to any sort of behavior change, and may only temporarily change attitudes (Heberlein, 2012). Education alone does not yield action unless community members are presented with opportunities to implement the information or skills gained, including management, research, or alternatives to resource utilization (Tambiah, 1999). Many presentations I observed during data collection discussed the problem of litter on the beaches and the resulting impacts on sea turtle health. While the children were chastised for littering and told not to litter, to use garbage cans and recycle when possible—there are virtually no places to dispose of trash on the beach, very few on the streets and no opportunities for recycling. What is the impact, if any, of educational programs that advocate for behavioral actions that are not possible within the institutional or social structure present? Increasing awareness

and knowledge without also providing a ‘structural fix’ (Heberlein, 2012) jeopardizes achieving conversation goals in the short and long-term.

In addition, general education presentations are often not specific enough about what the recipients of the information are expected to do or offer too many behavioral changes. People may be confused about whether or not they are even being asked to change a behavior and the consequences, if any, involved. This can be important when there is little follow-up or enforcement. If, as a conservation manager, the outreach and awareness objective is to change a behavior then it is necessary to be explicit about the desired behavior change and be consistent in future interactions. Without this, educational programs may lead to the simple memorization of conservation messages with little meaning attached to them and no action. During data collection I observed many respondents who were confused by a question that asked whether throwing garbage on the street harmed sea turtles. Half of all respondents indicated that they weren’t sure and frequently retorted, “garbage on the beach does, but not on the street,” as if I was asking a trick question that they were not going to be fooled by. Even among members of the community that were employed by the sea turtle conservation project there was little knowledge and understanding of how other environmental issues were connected to sea turtle conservation. While the conservation program may not see it as their mandate to educate the public on issues outside of sea turtle conservation it seems as if not doing so may incur unintended consequences that could jeopardize conservation goals.

Finally, while clarity and specificity can help improve many forms of participation, passive forms of participation do not allow for much interaction between community

members and conservation managers. Lack of dialogue that involves the exchange of information and knowledge can further reinforce power differentials between expert authority (biologists or project staff) and community members, endangering relationship and trust building. Gaining trust among community members and winning their support is especially important in small developing country communities. Furthermore, much could be learned about how people understand conservation issues if a more open dialogue that allowed people to openly question the information presented was supported and local knowledge was respected and encouraged (Berkes, 2004). Bringing clarity and specificity to participation has the potential to improve conservation outcomes by being explicit about conservation and participation goals, while also reforming passive forms of participation to better achieve such goals.

1.3.3 Issues of space and participation

Issues of space are often neglected when discussing participation, especially outside of co-management situations; however, social, political and even physical spaces can be very important to consider for conservation-related participation. Spaces are socially constructed through daily practice and are often a reflection of power dynamics in society (Cornwall, 2004). This can influence agency and voice—in other words, who participates and who doesn't. The public sphere has often been a place for political and social networking, dominated by men or people with higher social standing (Shields et al., 1996). The majority of conservation programs occur within the public sphere, not the private sphere or household, making it difficult for women and other marginalized people to participate. Considering the impact of the social, physical, and political aspects of space provides insight into who participates, who doesn't and why or

why not.

Conservation programs can constitute an institutionalized space within the public sphere that is infused with power based on enforcement control[19] through the national government or financial support from international organizations. This can deter people from participating for fear that they do not know enough or are not welcome, believing that their knowledge is inferior. I have often heard conservation managers complain that the people in the community didn't care about conservation or weren't interested, when in fact I believe it is more likely a result of power differentials that lead people to perceive that whatever they have to offer isn't good enough or wouldn't be of interest to the conservation program staff. I experienced this first hand when trying to encourage my research assistants to interact with the biologists at TAMAR. It was difficult for them to even enter the grounds outside the building, and they would often wait for me outside the gate even when it was open. They did not feel it was a space in which they were welcome, despite several conversations that stated otherwise, and were intimidated by the higher education levels of the biologists. Even though community members they knew also worked there, they were still reluctant to enter until I arrived. While there may have been other social dynamics at play regarding the local staff members, they were not the main deterrent. The TAMAR office and presence of the TAMAR staff (both non-local and local), at the office or in the community, created an institutionalized space that

[19] Much of the perceived power of TAMAR does not exist since they are not responsible for enforcement and cannot issue fines, only IBAMA can. Many people perceive TAMAR and IBAMA as one and the same, which is reinforced by signs on the beach that notify people of the laws, using both logos from TAMAR and IBAMA. However, TAMAR can only report infractions (such as motorcycles on the beach) to IBAMA and remind people of the law.

presented a barrier to local residents becoming more involved in and feeling a part of sea turtle conservation. At two other nearby TAMAR research bases, which both have visitor centers, local residents are allowed free admission and children sometimes 'hang out' at the center. These visitor centers may have created a neutral space for community members and conservation staff to interact, and possibly a space that helped the community feel closer to sea turtle conservation.

Sea turtle conservation occurs mainly on the beach and near shore areas, making the beach an important space to examine. The beach is a very public space where a lot of activity, particularly during the summer tourist season, occurs both by locals and outsiders. The beach physically transforms daily, as well as throughout the year depending on weather patterns. High tides can reduce the amount of sand beach available, sometimes only a sliver, while low tide can create a vast expanse of sand and rock. These changes influence how the beach is used and by whom, as well as where turtles make their nests and whether or not those nests are moved to an enclosure in order to keep the surf from washing them away or beach goers from disturbing the nest. In addition to natural oscillations, this space is significantly transformed during the summer season when it is teeming with people, motorcycles and dune buggies. Space can also be a part of what defines the community, giving a sense of identity. In many coastal communities in Brazil, the beach is an integral part of day-to-day life from providing sustenance through fishing, jobs from the tourism, and recreation. I found that the beach was a defining characteristic for many locals in my study communities, most likely a result of their dependence on fishing. Despite this, sea turtles were not

mentioned frequently and therefore did not seem to be a large part of their cultural identity.

The majority of participation programs occur in 'invited spaces' (Cornwall, 2008), meaning that they are organized and implemented by the conservation managers and community members are 'invited' to participate instead of the participation activities being created or co-created by the community members themselves. The idea of invited spaces is interesting due to the fact that most respondents indicated that the reason they hadn't participated in sea turtle conservation was that they weren't 'invited' or didn't know that they 'could.' While this is a literal translation, it does relate to issues of power and space in participation and who is included or excluded. Although some people may self-exclude for various reasons (Cornwall, 2008), the space or activity itself could unintentionally exclude people. Further discussion led me to believe the programs, particularly those on the beach where newly hatched sea turtles are released in the ocean, were perceived to be primarily for tourists and not locals. These *solturas*, or releases, occur mainly during the tourist season, which coincides with sea turtle nesting. Occasionally TAMAR invites local school children to attend releases that occur outside of the tourist season, as well as anyone on the beach at the time. The conversion of the beach from community to tourist space affects not only sea turtle conservation, but also local residents' perception of their role and connection to sea turtles and conservation. Other invited spaces for participation in sea turtle conservation include classroom presentations at local schools and presentations to the local fishers association. At times these groups invite a representative from TAMAR to present or participate in a specific activity, but often the process is the reverse and the group usually does not

decide what information is presented or how. Although these programs occur in community or public spaces, they are still invited spaces over which TAMAR has control.

Issues of space have not been fully addressed in conservation participation; yet present many obstacles to successful participation. Although sea turtle conservation may represent a unique example that incorporates aspects of physical space (e.g., the beach) in conjunction with the institutionalized and invited spaces created by TAMAR, these concepts can easily be applied to other conservation efforts. Conservation programs are often contending with issues of space and power in dealing with resource management issues, whether it is a protected area or other management area designation (Adams & Hutton, 2007). Such issues are likely more obvious than those related to participation, and the consequences can be just as damaging to conservation that depends on the cooperation and involvement of local residents. Considering the social construction of space could be very useful in analyzing the barriers to participation among community members and how to better and more appropriately use the relationship to space in planning participation.

1.3.4 Group involvement vs. participation in one-time activities

Participation, particularly when used merely as a technical tool, can become a series of one-time activities or events. Maybe these are yearly events such as beach clean-ups or presentations to schools on Earth Day. No matter what they are, there is often little connection between the events and the people that participate in the activities. At the same time, research has shown that there are definite advantages to being part of a group, including collaboration, social learning, and compliance (Gray,

1985; Pretty & Ward, 2001; Wondolleck & Yaffee, 2000); all of which can manifest through group involvement. Groups are not a panacea however, and they can be difficult to manage. Nonetheless, group involvement may be important to creating and maintaining positive attitudes, support and eventually behavior change for conservation.

Taking part in a long-term project or group as part of the conservation program may also help to create a sense of belonging or sense of community that includes the conservation program.[20] During a focus group with members of a men's soccer association, participants expressed their desire to be part of something—to belong. This may be especially important as urbanization continues to reach further and further into rural or remote areas. In coastal communities that are inundated with summer tourists and second home development, a sense of belonging and community may be waning. Long-time community members, those who have spent the majority of their life in the community, I spoke with mentioned how the area used to be different, not just physically but socially. Even residents in their 30s and 40s reminisced about the conservation program having an open door policy and being more integrated into the community in various ways, even those not conservation related. Older residents noted that they didn't used to lock their doors and slept with their windows open on hot nights without any fear of being robbed. Focus group participants also perceived the community to be less united than it was in the past and that there had been greater involvement in the church, sports, and cultural events—all of which has decreased over the years.

[20] TAMAR has been involved in what they call a 'resgate cultural' or cultural rescue, reintroducing cultural events, dances, songs, etc. and integrating conservation messages into them in other communities where they work such as Praia do Forte, Bahia and Pirambu, Sergipe.

Research regarding group involvement within conservation is primarily limited to studies of co-management. Projeto TAMAR manages many projects out of its headquarters in Praia do Forte, Bahia, including a “mini-guides” program for children 8–13 years of age (Vietas et al., 1999). The children participate in a 2-week summer course that teaches them about sea turtle conservation and trains them how to guide tourists through the exhibits. A select group of the children receive a stipend to work throughout the year as guides, during which they are also able to interact with the biologists and other staff, often helping with various tasks. Although the project was deemed a success, this evaluation was based on the positive remarks of the tourists regarding their experience with the mini-guide. Therefore the long-term impacts on the children of the group involvement are not known, nor can we compare it to children who have only participated in a one-time activity, such as a school presentation. Further research on the effect of group involvement vs. participation in one-time activities on support for and continued participation in conservation could prove valuable in the creation, planning and implementation of conservation participation.

1.3.5 Understanding context

The persistent myth of universality of participatory programs hinders the potential for participation in conservation. What works well in one area may or may not work well in another area, depending on the context. This requires knowledge and understanding of the underlying social and political structure, in addition to people’s perception of and relationship to the conservation issue (Painter & Krester, 2012). While this may seem overwhelming or even impossible, Machlis (2012) argues that we need to know enough about context in order to know what can be left out or what doesn’t need to be factored

into conservation planning. Painter and Krester (2012) further argue that contextual awareness can provide better social-ecological fit and lead to more appropriate conservation actions, as well as being able to better anticipate potential outcomes and local reactions. Context can also help in understanding why certain people participate and others don't, and under what conditions people may be inclined to participate.

Understanding the history of community engagement with external agencies (government, non-government, or other) can be important to gauging the potential for participation in conservation and managing expectations. Costa, Kottak and Prado's study (1997) demonstrates how historical sociopolitical context in northeastern Brazil has inhibited attempts at participatory development by contradicting the pervasive patron-client mentality that has persisted since colonialism. While the mutual dependency that characterizes the patron-client relationship could be seen as useful to conservation programs, it also places conservation program managers in a difficult position.[21] In an interview with a local resident once employed on a plantation, TAMAR was referred to as a "father figure" that now took care of them like the plantation once did (Stronza & Pêgas, 2008, p. 271). Robben's (1987) economic ethnography of a town on the southern coast of Bahia demonstrates how the patron-client relationship has been recreated between fishers and boat owners, restricting the ability of fishers to prosper on their own or as a collective. Although TAMAR does not enter into financial relationships of this nature, the mutual dependency that is created between the

[21] Patron-client mentality can be a barrier to horizontal or collective organizing within one class.

conservation project and the community may suppress individual initiative, responsibility and collective action.

Under the patron-client relationship, the parties involved have very specific responsibilities. For example, the sea turtle conservation project is seen as being responsible for conservation (including enforcement, monitoring, and protection) and employs a small number of community members to help in these endeavors. These employees do their job, during work hours, while they are getting paid—nothing more. When they are wearing their uniform (TAMAR t-shirt) they complete the required tasks and serve as conservation ambassadors; however, when they are not working it would be tough to find them practicing what they preach. Conversely, TAMAR is obligated to assist in personal affairs—money for medicine, rides to the doctor or to the city to complete paperwork, etc. While the latter is very positive, the expectations are not equal. TAMAR expects more from their employees and community members than they receive, which can lead to poor relations and negative perceptions about local community members.[22]

While historical patterns of participation and engagement can present barriers to participation, many current social, cultural and institutional factors can also prevent or hinder participation among particular groups of people. Community members that are

[22] In a patron-client relationship, a client's loyalty is based on the ability of the patron to provide favors. In these communities (and other parts of Northeastern Brazil) there is a strong belief that the government has certain responsibilities (e.g., providing employment, healthcare, safety and security, etc.). This affects the environment and participation in environmental efforts in many ways. For example, people don't pick up garbage because that would take away a job from someone since the government employs poor people to pick up garbage on the street.

not involved in fishing or the fishers' association can often be unintentionally excluded from sea turtle conservation, since fishers are seen as the main stakeholder. This can particularly exclude women who may not be open-water fishers or who do not belong to the fishers' association for a variety of reasons. A few women expressed their lack of voice in the fishers' association, as well as the fact that the association often does not address issues of concern to them that relate to mangrove and lagoon fishing. Women's time for attending meetings or other activities is also limited due to their household responsibilities. Households with more financial resources may be able to employ others to help with cooking, cleaning, and child rearing. However, households without such resources often stand to benefit more from participation in conservation programs or the fishers' association.

1.4 Conclusion

The considerations presented reflect issues at the micro and macro scale that may help refine theory and be used to guide evidence-based practice. However, understanding people's perceptions and attitudes toward conservation and participation, strategically planning participation in conjunction with conservation goals and with participant needs in mind, as well as assessing community social structure and historical patterns of participation, is no small task. Ideally it would require trained staff familiar with concepts and methodologies used in human dimensions of wildlife and the social sciences. This appears to be a rarity in conservation programs, where biologists with little training and/or interest are tasked with creating and implementing a community engagement program. Smaller programs without the resources to hire staff to work on participation should consider partnering with other organizations that can

more effectively and efficiently address education or even social issues. Conservation themes can also be integrated into other community events and activities, and long-term relationships with community organizations can provide opportunities for continued follow-up, as well as increase trust and cooperation. Finally, trained biologists should not be expected to be educators or facilitate community participation without proper training, tools, time, and interest.

Aside from enlisting or training the appropriate person, there is the issue of how information regarding attitudes, participation preferences, social structure and other issues related to context would be collected and interpreted. Social capital,[23] comprised of networks, norms and trust, can serve as a conceptual framework for understanding context, including: community social structure, perceptions and definitions of participation, individual and organizational capacity for involvement, and the location of the conservation program within the community's social and institutional structure (Head, 2007; Krishna & Shrader, 1999; Moore et al., 2006; Thuy et al., 2011). Interviews, questionnaires, focus groups and institutional analysis are a few of the methodological tools that can be used to collect the necessary data. The following chapters illustrate how this information can be collected and analyzed, as well as how it can be used to inform participation in conservation programs.

Most of what is studied sits at one end of the spectrum of participation or the other; however, there are many strategies that can be used and often a combination of strategies are required. Participation has the potential to be more than just a technical

[23] Chapter 2 provides a more thorough introduction to social capital and the concepts presented here.

tool and should be viewed as part of the larger conservation strategy that requires just as much time and effort as the biological aspects. When viewed solely as a technical tool, it is too easy to attempt the same sort of participation in every place with every type of person for every issue. This requires more than simply knowing your audience, but understanding their perception of the issue, their social, political and economic situation in general and in relation to natural resources—as well as their capacity for involvement. Ignoring important aspects of context dismisses the social and political processes imbued in participation. Furthermore, by changing our conceptualization of participation in conservation to meet already established ideals of participation at the community level, more meaningful and long-lasting participation by a more representative sample of the community can be created, with greater potential to address both social and conservation goals.

REFERENCES

REFERENCES

Adams, W. M. (2001). *Green development: Environment and sustainability in a developing world.* 2nd Edition. Routledge: London.

Adams, W. M., & Hutton, J. (2007). People, parks and poverty: Political ecology and biodiversity conservation. *Conservation and Society*. *5*(2), 147.

Agrawal, A., & Gibson, C. (1999). Enchantment and disenchantment: The role of community in natural resource management. *World Development*. *27*(4), 629-649.

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, *35*(4), 216–224. doi:10.1080/01944366908977225

Berkes, F. (2004). Rethinking community-based conservation. *Conservation Biology*. *18*(3), 621–630.

Agarwal, B. (2001). Participatory exclusions, community forestry, and gender: An analysis for South Asia and a conceptual framework. *World Development*. *29*(10), 1623–1648. doi:10.1016/S0305-750X(01)00066-3

Blaikie, P. (2006). Is small really beautiful? Community-based natural resource management in Malawi and Botswana. *World Development*. *34(*11), 1942–1957.

Brosius, J. P., Tsing Lowenhaupt, A., & Zerner, C. (2005). *Communities and conservation: Histories and politics of community-based natural resource management*. AltaMira Press: Walnut Creek, CA.

Campbell, L. M. (2007). Local conservation practice and global discourse: A political ecology of sea turtle conservation. *Annals of the Association of American Geographers*. *97*(2), 313–334.

Campbell, L. M. & Vainio-Mattila, A. (2003). Participatory development and community based conservation: Opportunities missed for lessons learned? *Human Ecology*. *31*(3), 417–437.

Campbell, J. M. & Godfrey, M. H. (2002). Community-based conservation via global legislation? Limitations of the Inter-American Convention for the Protection and Conservation of Sea Turtles. *Journal of International Wildlife Law and Policy*. *5*, 121–143.

Chan, K. M. A., Pringle, R. M., Ranganathan, J., Boggs, C. L., Chan, Y., Ehrlich, P., Haff, P. K., Heller, N. E., Al-Khafaji, K., & Macmynowski, D. P. (2007). When agendas collide: Human welfare and biological conservation. *Conservation Biology*. *21*(1), 59–68.

Chase, L. C., Schusler, T. M., & Decker, D. J. (2000). Innovations in stakeholder involvement: What's the next step? *Wildlife Society Bulletin. 28*(1), 208–217.

Cheng, A. S., & Mattor, K. M. (2006). Why won't they come? Stakeholder perspectives on collaborative national forest planning by participation level. *Environmental Management*. *38*(4), 545–561. doi:10.1007/s00267-005-0124-3

Cleaver, F. (2001). Institutions, agency and the limitations of participatory approaches to development. In B. Cooke and U. Kothari (Eds.), *Participation, the New Tyranny?* pp.36–55. New York: Zed Books.

Cooke, B. & Kothari, U. (Eds.). (2001). *Participation, the new tyranny?* New York: Zed Books.

Cornwall, A. (Ed.) (2011). *The participation reader*. New York: Zed Books.

Cornwall, A. (2008) Unpacking participation: models, meanings and practices. *Community Development Journal*. *43*(3), 269–269.

Cornwall, A. (2004). Spaces for transformation? Reflections on issues of power and difference in participation in development. In S. Hickey and G. Mohan (Eds.), *Participation: From tyranny to transformation? Exploring new approaches to participation in development*. New York: Zed Books.

Cornwall, A. (1998). Gender, participation and the politics of difference. In I. Gujik and M. K. Shah (Eds.), *The myth of community: Gender issues in participatory development.* pp. 46–57. London: Intermediary Technology Publications.

Costa, A. C. G., Kottak, C. P., & Prado, R. M. (1997). The sociopolitical context of participation development in Northeast Brazil. *Human Organization*. *56*(2), 138–146.

Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas, (Pró TAMAR). (2011). *Relatório de Atividades 2011*.

Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas, (Pró TAMAR). (2010). *Relatório de Atividades 2010*.

Frazier, J. (1999). Community-based conservation. In K. L. Eckert, K. A. Bjorndal, F. A. Abreu Grobois, and M. Donnelly (Eds.), *Research and management techniques for the conservation of sea turtles.* pp.15–18. Washington, DC: IUCN/SSC Marine Turtle Specialist Group.

Gelcich, S., Edwards-Jones, G., & Kaiser, M. J. (2005). Importance of attitudinal differences among artisanal fishers toward co-management and conservation of marine resources. *Conservation Biology*. *19*(3), 865–875. doi:10.1111/j.1523 1739.2005.00534.x

Gray, B. (2004). Strong opposition: frame-based resistance to collaboration. *Journal of Community & Applied Social Psychology*. *14*(3), 166–176. doi:10.1002/casp.773

Head, B. W. (2007). Community engagement: Participation on whose terms? *Australian Journal of Political Science*. 42(3), 441–454. doi:10.1080/10361140701513570

Heberlein, T. A. (2012). *Navigating environmental attitudes*. New York: Oxford University Press.

Hickey, S. & Mohan, G. (2004). *Participation: From tyranny to transformation? Exploring new approaches to participation in development*. New York: Zed Books.

Kellert, S. R., Mehta, J. N., Edin, S., & Lichtenfeld, L.L. (2000). Community natural resource management: promise, rhetoric, and reality. *Society and Natural Resources*. *13*, 705–715.

Krishna, A. & Shrader, E. (1999). Social capital assessment tool. *Prepared for the Conference on Social Capital and Poverty Bank June*, 22–24.

Machlis, G. (2012). Plenary address given at the Pathways to Success Conference: Integrating Human Dimensions into Fisheries and Wildlife Management. Breckinridge, CO.

Martinussen, J. (1997). *Society, state & market: A guide to competing theories of development*. London and New York: Zed Books.

Michener, V. J. (1998). The participatory approach: Contradiction and co-option in Burkina Faso. *World Development*. *26*(12), 2105–2118. doi:10.1016/S0305 750X(98)00112-0

Midgley, J. (2011). Community participation: History, concepts and controversies. In A. Cornwall, (Ed.), *The participation reader*. New York: Zed Books.

Moore, S. A., Severn, R. C., & Millar, R. (2006a). A conceptual model of community capacity for biodiversity conservation outcomes. *Geographical Research*. *44*(4), 361–371. doi:10.1111/j.1745-5871.2006.00407.x

Oates, J. F. (1999). *Myth and reality in the rain forest: How conservation strategies are failing in West Africa.* Berkley and Los Angeles, CA: University of California Press.

Ostrom, E., Dietz, T., Nives, D., Stern, P., Stonich, S., & Weber, E. U. (Eds.) (2002). *The drama of the commons*. Committee on the Human Dimensions of Global Change, National Research Council (U.S.), Washington, DC: National Academy Press.

Painter, M., & Kretser, H. E. (2012). Contextual awareness in long-term partnerships builds adaptive capacity for conservation. *Human Dimensions of Wildlife*. *17*(5), 357–366. doi:10.1080/10871209.2012.710711

Pita, C., Pierce, G. J., & Theodossiou, I. (2010). Stakeholders' participation in the fisheries management decision-making process: Fishers' perceptions of participation. *Marine Policy*. *34*(5), 1093–1102. doi:10.1016/j.marpol.2010.03.009

Pretty, J. N. (1995). Participatory learning for sustainable agriculture. *World Development*. *23*(8), 1247–1263. doi:10.1016/0305-750X(95)00046-F

Pretty, J., & Smith, D. (2004). Social capital in biodiversity conservation and management. *Conservation Biology*. *18*(3), 631–638. doi:10.1111/j.1523-1739.2004.00126.x

Pretty, J., & Ward, H. (2001). Social capital and the environment. *World Development*. *29*(2), 209–227.

Projeto TAMAR-IBAMA. (n.d.). website, www.projetotamar.org.br , last accessed 01 May 2013.

Reed, M. S. (2008). Stakeholder participation for environmental management: A literature review. *Biological Conservation*. *141*(10), 2417–2431. doi:10.1016/j.biocon.2008.07.014

Ribot, J. C. (2002). *Democratic decentralization of natural resources: Institutionalizing popular participation*. Washington, D.C.: World Resources Institute.

Robben, A. C. G. M. (1989). *Sons of the sea goddess: Economic practice and discursive conflict in Brazil.* New York: Columbia University Press.

Robertson, J., & Lawes, M. J. (2005). User perceptions of conservation and participatory management of iGxalingenwa forest, South Africa. *Environmental Conservation*. *32*(01), 64–75. doi:10.1017/S0376892905001979

Russell, A. J. M., & Dobson, T. (2011). Chiefs as critical partners for decentralized governance of fisheries: An analysis of co-management case studies in Malawi. *Society & Natural Resources*. *24*(7), 734–750 doi:10.1080/08941920.2010.501432

Shields, M. D., Flora, C. B., Thomas-Slayter, B., & Buenavista, G. (1996). Developing and dismantling social capital: Gender and resource management in the Philippines. In D. Rocheleau, B. Thomas-Slayter, & E. Wangari (Eds.), *Feminist Political Ecology: Global Issues and Local Experiences*. New York: Routledge.

Stronza, A., & Pêgas, F. (2008). Ecotourism and conservation: Two cases from Brazil and Peru. *Human Dimensions of Wildlife*. *13*, 263–279.

Tambiah, C. (1999). “Community participation” in sea turtle conservation: Moving beyond buzzwords to implementation. In H. J. Kalb & T. Wibbels (Compilers), *Proceedings of the Nineteenth Annual Symposium on Sea Turtle Biology and Conservation*. pp. 59–61. U.S. Dept. of Commerce. NOAA Tech. Memo. NMFS SEFSC-443.

Thuy, N. N., Dwivedi, P., Rossi, F., Alavalapati, J. R. R., & Thapa, B. (2011). Role of social capital in determining conservation attitude: a case study from Cat Tien National Park, Vietnam. *International Journal of Sustainable Development & World Ecology*. *18*(2), 143–153. doi:10.1080/13504509.2011.560455

Vietas, C. F., Lopez, G. G. & Marcovaldi, M. A. (1999). Local community involvement in conservation: the use of mini-guides in a programme for sea turtles in Brazil. *Oryx*. 33(2), 127–131.

Wagenet, L. P., & Pfeffer, M. J. (2007). Organizing citizen engagement for democratic environmental planning. *Society & Natural Resources*. *20*(9), 801–813. doi:10.1080/08941920701216578

Walker, G., Senecah, S., & Daniels, S. (2006). From the forest to the river: Citizens’ views of stakeholder engagement. *Human Ecology Review*. *13*(2), 193–202.

Wondolleck, J.M., & Yaffee, S.L. (2000). Making collaboration work: Lessons from innovation in natural resource management. Washington, D.C.: Island Press.

Zulu, L. C. (2008). Community forest management in Southern Malawi: Solution or part of the problem? *Society and Natural Resources*. *21*(8), 687–703.

CHAPTER 2

INFORMING COMMUNITY ENGAGEMENT IN SEA TURTLE CONSERVATION BY EXAMINING NON-CONSERVATION RELATED PARTICIPATION AT THE COMMUNITY-LEVEL: A CASE STUDY OF FOUR COASTAL COMMUNITIES IN NORTHEAST BRAZIL

2. Introduction

Engaging communities in conservation efforts remains an important aspect of many conservation programs and often serves as a vehicle for education, policy formation and implementation, legal enforcement, and even scientific monitoring. Despite its frequent use and promotion, lack of understanding and attention to social structure as well as historical and political context often inhibit the success of participation. Existing social capital research demonstrates the potential benefits of conservation participation among groups of stakeholders; however, less is known about the influence of social capital at the community[24] level on participation in conservation. The interplay between individual characteristics and contextual or situational circumstances is important in predicting and understanding participation at the community level (Wandersman & Giamartino, 1980). This research examines the role of social capital, a useful analytic tool, in illuminating how participation in existing non-conservation organizations may influence participation in conservation.

A fundamental tenet of both social capital and common-pool resource management is that group involvement or participation can positively affect individuals,

[24] Although the term 'community' can be problematic, it is used here to constitute a group of people living in geographic proximity to each other.

communities and resources by facilitating collective action and access to benefits (Gutierrez, Hilborn & Defeo, 2011; Portes, 1998; Ostrom, 2009; Ostrom et al., 2002; Pretty & Smith, 2004 and others). Social capital, a concept more frequently used in political science, sociology, and economics, is commonly defined as networks, norms of reciprocity and relationships of trust that facilitate collective action (Coleman, 1988; Grootaert & Van Bastelaer, 2001; Putnam, 1993, 2000). The components of social capital are often organized into two dimensions: structural and cognitive. Grootaert and Van Bastelear (2002) describe the structural dimension as families, social networks, membership in voluntary associations and churches, whereas the cognitive dimension includes shared norms, values, attitudes, and beliefs that predispose people toward mutually beneficial collective action. Structural relationships facilitate the use of social capital toward mutually beneficial actions by providing already established roles, rules, and procedures, both formal and informal. The structural and cognitive dimensions can be important influences on participation in community life, as shown in studies of political participation. Putnam (2000) argues that this combination of social networks and social norms is an essential aspect of involvement in civic and voluntary associations for political participation. Furthermore, a lack of participation in associational life—as Putnam refers to it—limits social interaction and civic discussions that can encourage engagement.

In the conservation literature, the concept of social capital has most often been used in the study of common-pool resources, often referred to as community-based conservation in a developing country context and collaborative partnerships within North America (Ballet et al., 2007; Ostrom, 1990; Pretty & Smith, 2004; Wagner & Fernandez-

Gimenez, 2008). The connections between and within groups of people and the ways in which these connections are used to gain or restrict access to resources and disseminate information can be important in understanding conservation decision-making, in addition to the impact of conservation on different social groups. Pretty and Ward (2001) depict social capital as involving (a) relations of trust; (b) reciprocity and exchange; (c) common rules, norms, and sanctions; and (d) connectedness in networks and groups. These are also important characteristics in Ostrom's (1990) institutional arrangements for common-pool resource management, which has been expanded upon to include social capital (defined as past successful experiences) as a separate indicator from norms and reciprocity (Agrawal, 2001). Similarly, Pretty and Smith (2004) and others have asserted that social capital is influential in shaping conservation attitudes through the exchange of information, lowering of transaction costs, and reinforcing social bonds and norms. However, these studies tend to focus only on social capital at the group level in collaborative partnerships focused on collective action. This approach is not as helpful for understanding participation in conservation programs, such as endangered species protection and other programs, where co-management with a small group of stakeholders is not an option or desirable.

Aside from co-management situations, social capital has also been shown to have a positive influence on environmental or conservation policy (Jones, 2010; Jones et al., 2011), attitudes (Macias & Nelson, 2011; Thuy et al., 2011), performance/quality (Dulal, Foa & Knowles, 2011; Kramer, 2007), behavior (Jin, 2013), and activism (Marquart-Pyatt, 2012). It is important to note that social capital can also have a negative effect on natural resources, such as facilitating the subversion of resource

management restrictions (Lansing, 2009), or have no effect at all (Grafton & Knowles, 2004; Duit et al., 2009). Despite the variety of studies related to conservation and social capital in the literature, none were found that examined social capital outside of a stakeholder group or as a separate indicator of community social structure (or characteristic of the community). For example, Cramb (2005) only measures social capital among people involved in Landcare programs and Sekhar (2006) only measures social capital among fishers belonging to the fishers association. Even when sampling outside of stakeholder groups, Jin (2013) measured social norms and civic participation only in relation to environmental behaviors, asking respondents questions regarding how much they are willing to pay to protect the environment or how much they trust in the local government to address environmental concerns. Of course, all of these studies provide important and useful information to understanding social capital within environmental issues or natural resource stakeholder groups. However, they still isolate conservation issues from other aspects of community social life, both formal and informal. In this paper I argue that such isolation overlooks the significant influence of non-conservation related social life, as demonstrated by social capital analysis, on participation in conservation.

After a thorough literature review, no study was found that examined social capital outside of a stakeholder group at the community level and empirically tested the relationship between social capital, conservation attitudes and conservation participation. With this research I begin to fill this gap by building on previous research related to social capital. Figure 2.1 presents the conceptual model used in this study. Following standard structural equation model (SEM) conventions (Byrne, 2012), ovals

represent latent variables and squares represent observed variables. This study suggests that other factors at the community level also influence participation in conservation. Social capital provides a framework to assess individual and community capacity and interest in participation (both for individual and collective benefit) and the role this might play in conservation participation. Adapting the World Bank Social Capital Assessment Tool (SOCAT) to measure the cognitive and structural dimensions of social capital, I employed structural equation modeling to explore the relationship between social capital, conservation attitudes, and conservation participation.

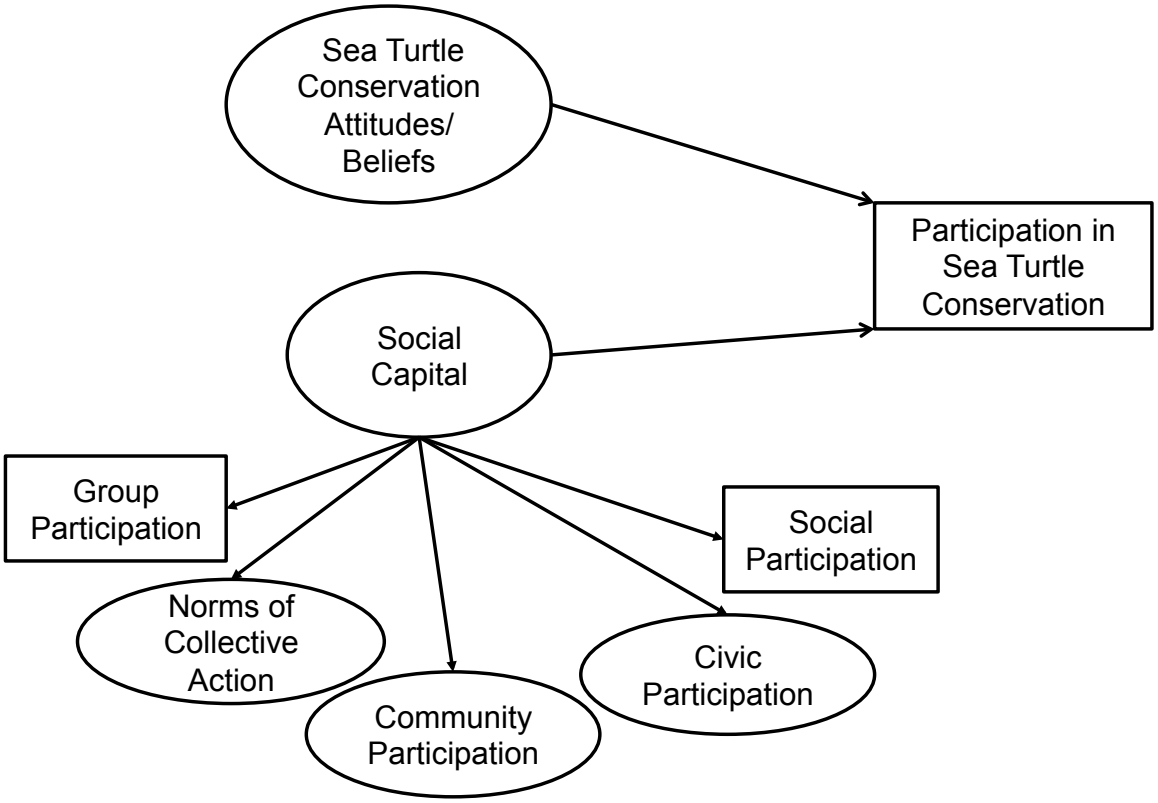


Figure 2.1 Conceptual model
(Ovals represent latent variables and squares represent observed variables.)

2.1 Methods

2.1.1 Description of study area

This study was conducted in four coastal towns located in the state of Bahia (BA) on Brazil's northeastern coast: Sítio do Conde, Poças, Siribinha and Barra do Itarirí. Sítio do Conde is the largest of the four communities with ~2,500 residents and Siribinha the smallest with ~500 year-round residents (Instituto Brasileiro de Geografia e Estatística [IBGE], 2010).[25] Located within the municipality of Conde (population 23,600), these communities are characterized by a historical dependence on coconut and sugar plantations, as well as fishing, and more recently an influx of seasonal and weekend beach tourism. According to the Colônia de Pescadores Z-31 (fishers' association) in Sítio do Conde there are roughly 450 associated fishers from the surrounding communities; however, this does not include those that fish for recreation or in times of need to feed their families. The region is also part of a sustainable-use protected area (APA do Litoral Norte) that engages local, state and federal governments to address increasing urbanization and development and protect the coastal ecosystem (Secretaria do Meio Ambiente da Bahia, 1992).[26]

The national Brazilian sea turtle conservation program, Projeto TAMAR (hereafter referred to as TAMAR), manages 22 research stations along the entire coast of Brazil, a few visitors' centers, merchandise stores, and a foundation that manages

[25] A census was conducted in 2010; however, population counts were only available for the municipality and not each individual town. Several attempts were made to contact the Statistical and Geographical Institute of Brazil (IBGE) but I was unsuccessful in securing the most up-to-date population counts for these four communities.

[26] http://www.meioambiente.ba.gov.br/conteudo.aspx?s=APALITOR&p=APAAPA

efforts related to community engagement. Established in October of 1991, the TAMAR research station in Sítio do Conde monitors 44 km of coastline running north and south, encompassing the four communities in this study.[27] This stretch of coastline contains prime nesting beaches for the olive ridley (*lepidochelys olivacea*), hawksbill (*eretmochelys imbricata)* and loggerhead (*caretta caretta*). As a result of increasing development and the influx of tourists during the reproductive and nesting cycle (summer months of November through March), many nests along the beaches are relocated to an enclosed area on the beach. However, nests on more secluded and less populated sections of the beach are sometimes left *in situ*, but marked and covered with a mesh cloth to discourage dogs and other small animals. For the 2011-2012 reproductive season there was an effort to leave more nests *in situ* and only move them to an enclosure when they were in an area threatened by the surf or human activity.[28]

Since its inception in 1980, TAMAR has released more than 15 million turtle hatchlings into the ocean, or roughly one million per year with 40-50% hatching in the state of Bahia (Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas [Fundação Pró TAMAR], 2010 & 2011). An analysis of 15 years of monitoring data from 1991-2006 revealed an increase of 7 times the number of hawksbill nests, a species that primarily nests along the northern coast of Bahia (Projeto TAMAR [TAMAR] website, 2013). Other species also showed an increase of 5 to 10 times the number of

[27] The TAMAR research base in Sítio do Conde also manages what is considered a 'sub-base' in Mangue Seco which is only staffed by TAMAR during the reproductive season (October–March). This adds an additional 41 km of beach, resulting in a total of 85 km for the TAMAR research station in Sítio do Conde.

[28] Information presented at a meeting for TAMAR beach monitoring staff before the beginning of the 2011-2012 reproductive season.

nests over a 10- or 15-year period depending on the species. For Sítio do Conde and surrounding areas, the number of nests was on the rise with 1510 nests in 2009-2010 and 1753 nests in 2010-2011, a 16% increase.[29] TAMAR attributes this success to increased monitoring, support from communities, and heightened awareness of sea turtle conservation by fishers and beachgoers (Marcovaldi, Patiri, & Thomé, 2005). Seasonally, TAMAR employs one person in each of the communities of Barra do Itaririí, Poças, and Siribinha for monitoring, and two people in Sítio do Conde to conduct year-round monitoring for the beaches of all four communities.

Nationally TAMAR engages the public through their various visitor's centers, website, DVDs, books, music CDs, and expositions in malls, schools, and other venues. At the community level, TAMAR engages in various activities surrounding: *sensibilização* (awareness raising) and environmental education, presentations and expositions, income generation, social and cultural valorization, and financial or other support to community associations or activities. In 2010 and 2011, TAMAR staff conducted or participated in 287/385 presentations and 128/126 expositions reaching 13,014/19,847 and 260,404/275,039 people respectively (Fundação Pró TAMAR, 2010 & 2011).[30] The primary forms of community engagement employed in Sítio do Conde include informational presentations with schools and local fisher groups, public release of sea turtle hatchlings on local beaches, and the distribution of informational posters, magazines and other materials to local restaurants and hotels. From 2008 to 2012, staff

[29] Same as above.

[30] The increase from 2010 to 2011 is most likely due to celebrations in conjunction with TAMAR's 30th anniversary.

conducted or organized[31] 36 school presentations for approximately 2511 primary and secondary local school children and over 10,000 people participated in hatchling or rehabilitated sea turtles releases on the beach. However, it is important to note that these releases occur primarily throughout the reproductive season, also the tourist season, meaning that participants in this type of activity are more likely to be tourists than local residents. In comparison to the national data presented above, participants in activities conducted by the research base in Sítio do Conde represent 4% of all participants nationally.

2.1.2 Data collection

I used a sequential mixed-methods approach to data collection involving semi-structured interviews and household questionnaires (Creswell & Plano, 2010). Information from the semi-structured interviews served to inform the sampling plan and content of the questionnaire. Interview schedules and household questionnaires were adapted from the World Bank Social Capital Assessment Tool (SOCAT) (Krishna & Shrader, 1999). Interviews included the following thematic sections: community characteristics, community governance and decision-making, community institutions, and community involvement in sea turtle conservation. Fifteen semi-structured interviews were conducted across four communities (Sítio, Poças, Siribinha, Barra do Itariri) until saturation was reached or no new information was found, as evidenced by identical or similar responses to open- and closed-ended questions (Rubin & Rubin,

[31] Some presentations to schools were organized through an educational non-profit organization in Brazil, Passa Tempo, that travels the country presenting educational skits on various themes to school children. TAMAR solicited their services to conduct environmentally themed skits and activities.

2005). Participants included: local TAMAR staff, church representatives, leaders of local fishers' associations (Colônias de Pescadores), a representative from the health clinic, a leader of a non-profit youth organization, and other individuals identified by respondents as highly involved in the community.

In order to determine the sampling frame for the questionnaire, information was collected from local public health officials on the number of families within each community[32] and an informal count of houses. Using this information, maps of each community were drawn with estimated counts on the number of houses per street (both seasonal and permanent). In the larger communities of Sítio do Conde and Barra do Itariri,[33] a stratified sampling frame based on locally identified neighborhoods was devised with 20% of houses (or 1 in every 5 houses) per street within each neighborhood being approached. For the smaller communities of Poças and Siribinha, every house was approached except for unoccupied seasonal dwellings.[34] To ensure gender and age diversity, any person 18 years of older found to be at home and consenting to take part in the study was interviewed. Days and times were also varied, taking into account varying working schedules and culturally appropriate times for visitors. The questionnaires were administered orally in Portuguese in or near the

[32] Sítio do Conde—678 families, Poças—117 families, Siribinha—95 families and Barra do Itariri—294 families

[33] One neighborhood within Barra do Itariri was not sampled based on its isolated location which was far from the beach and therefore not as heavily involved in fishing or effected by sea turtle conservation efforts. Safety issues were also of concern in this neighborhood.

[34] Seasonal dwellings are usually boarded up and easily identifiable; however, if there was any doubt neighbors were asked to verify whether the occupants were seasonal or permanent residents.

respondent's home[35] with the average time for completion approximately 40 minutes. Questionnaires were completed over a two-month time period between August 1 and September 30, 2011. All questionnaires were administered by one of three local research assistants or me.

2.1.3 Respondents / Sample

In total 341 questionnaires were administered: Sítio do Conde (n=174), Poças (n=57), Siribinha (n=39), and Barra do Itariri (n=71). Two questionnaires were incomplete, missing half or more of all responses, and therefore removed from the sample leaving a total sample size of n=339. Of the 339 respondents, 197 were women and 143 were men. Table 2.2 presents descriptive statistics for the sample. Income and education level was low among all communities, with 61% of the overall sample indicating a household monthly income of 2 minimum salaries or less (approximately R$1080 or US$540) and 57.3% having only completed some primary schooling.[36] Demographic characteristics of the sample are representative of the population according to the 2010 census for the municipality of Conde (IBGE, 2010).

[35] In some cases men were more easily found outside of the home, usually mending fishing nets near the port or center of town. Care was taken to avoid duplication of a household by asking where the respondent lived and if anyone in their family had already participated. While duplication may exist there is no reason to believe that it occurred at a high enough rate to influence the results.

[36] A more detailed description of the sample demographics by community is included in the Appendix.

Table 2.1 Summary of sample demographics

Characteristics of Respondents	Percentage of Total Sample (n=339)
Community of Residence	Sítio do Conde=51.0%(173), Poças=16.5%(56), Siribinha=11.5%(39), Barra do Itariri=20.9%(71)
Gender	41.8%(142) Men, 57.9%(197) Women
Age	Minimum=18, Maximum=79, Mean=40 (sd 14.81) 18 to 25=21.8%(74), 26 to 35=23.6%(80), 36 to 45=18.0%(61), 46 to 55=19.2%(65), 56 to 79=17.4%(59)
Education	None = 7.7%(26), Some primary = 49.6%(168), Primary & some secondary = 37.8%(128), Secondary & higher = 5.0%(17)
Profession	None=11.2%(38), Fisher=20.1%(68), Household Manager=18.3%(62), Retired=9.7%(33), Domestic Worker=5.6%(19), Teacher=4.7%(16), Self-Employed=4.1%(14), Merchant=4.1%(14), Tourism/Service Industry=3.8%(13), Construction worker=2.7%(9), Farmer=2.7%(9), Student=2.7%(9), Local government worker=2.1%(7), Handyman=1.5%(5), Taxi driver=1.5%(5), Security guard=1.2%(4), Artist=0.6%(2), Caretaker=0.6%(2), Various Other=2.9%(10)
Average Respondent Income* (n=332)	No Income=40.1%(140), <1 m.s.=24.6%(84), ≤2 m.s.=27.5%(93), ≤3 m.s.=2.0%(7), ≤4 m.s.=1.5%(5), >4 m.s.=0.9%(3) [In minimum salary R$540=US$270]
Average Household Income* (n=317)	Mean=2.34 m.s. (sd=1.496) [≤R$1263 or US$631] No Income=10.3%(35), ~1 m.s.=18.0%(61), ~2 m.s.=28.9%(98), ~3 m.s.=12.1%(41), ~4 m.s.=13.9%(47), >4 m.s.=10.3%(35)
Receive Government Benefits	None=50.3%(172), Compensation for embargo on shrimp fishing=3.8%(13), Bolsa Família=33.1%(113), Social security=10.5%(36), Other benefits (pension, child support, disability)=2.6%(9)
# of Household Members	Minimum=1, Maximum=11, Mean=4.0 (sd=1.98)

*The lower sample size reflects respondents that preferred not to indicate their salary or the salary of other household members. Household income was calculated based on the respondent's admission of household member incomes.

2.1.4 Measures

The questionnaire consisted of five sections: (1) demographic information about household members; (2) housing characteristics; (3) attitudes on the environment and sea turtle conservation; (4) community organizations, participation and collective action; and (5) trust and cooperation. Each section was constructed of a mix of open- and close-ended questions, including Likert scale and similar rating type questions. All research instruments were pre-tested in the field and revised as appropriate. The measures used in this study were selected based on their reliability and validity in international contexts (Krishna & Shrader 1999; Narayan & Cassidy 2001) and are described in greater detail below.

Associational networks (civic, community, and social participation). This measure was developed following the Social Capital Assessment Tool (SOCAT)[37] household questionnaire (Krishna & Shrader, 1999) and using the definitions and categorizations of social, civic and community participation based on Hodgkin (2008). Civic participation includes those activities that relate to political or community activism, either on an individual or collective basis (6 items). Community participation is a mix of civic and social activities such as volunteering for a local charity, service club, or school group (6 items). Social participation includes activities such as such as visiting with family and friends or attending a social event in a public space (4 items). Respondents were asked how often they had participated in various civic, community, and social activities over the past three years. The response options included always, almost always, sometimes, almost never, and never.

[37] Survey and interview instruments for SOCAT can be found at http://go.worldbank.org/KO0QFVW770

Group Participation. Participation in a community group or organization was measured by asking respondents to list up to three groups that they currently participate in. A dichotomous variable was then created to indicate the presence or absence of participation in a group (0=no group participation, 1=participation in 1 or more groups). The number of people who participated in more than one group was too small to consider a separate category.

Participation in sea turtle conservation. Participation in sea turtle conservation was measured through a binary variable where respondents were asked whether or not they had ever participated in sea turtle conservation through a TAMAR sponsored activity. A dichotomous, or dummy variable (0=has not participated, 1=has participated) was used.

Attitudes toward sea turtle conservation and TAMAR. Fifteen Likert-type questions (five-item from strongly disagree to strongly agree) were created to evaluate respondents' attitudes toward sea turtle conservation, TAMAR and nature conservation in general. General questions regarding sea turtle conservation focused on perceived importance (e.g., The conservation of sea turtles is important for your family) and desire to learn more or participate in sea turtle conservation (e.g., You would like to participate in sea turtle conservation or know more about conservation in general). Questions were also based upon TAMAR's educational messaging regarding sea turtle conservation (e.g., Upon finding a sick animal on the beach you would notify TAMAR) and TAMAR's involvement with the community (e.g., TAMAR should talk with people here before making decisions about sea turtle conservation).

Trust. Generalized social trust (e.g., Most people here are basically honest and can be trusted) and cooperation (e.g., If you have a problem, there is always someone to help)

was measured using eleven five-item Likert-type questions. These items were directly adapted from the SOCAT household questionnaire (Krishna & Shrader, 1999).

Collective Action. Collective action was measured using two five-item Likert scale and four rating scales. These items assessed the respondents' participation in collective action (e.g., In the last year, how many times did you unite with other people from this town in order to resolve a problem?), perception of others' participation in collective action, perception of collective spirit among community members, perception of influence in community-level decision-making and leadership involvement in decision-making (e.g., The leaders here bring people together to discuss issues before making any decisions about the progress of the town).

Demographic information. Socio-economic information was collected for each household member, including community of residence, income, age, gender (coded as female=1 and male=0), marital status, education, profession, and whether or not they received any government benefits such as *bolsa família* (government program that provides a monthly stipend to mothers with children in school). Household income was calculated based on the reported incomes for each individual household member recorded. Income and education level were fairly homogeneous, and were not used as covariates in the model. Only gender, age, and community of residence were tested as covariates in the model.

2.2 Data analysis & results

Data analysis was conducted in a two-step process analyzing the measurement models first and then the structural model. Because the focus of this article is the

structural equation model the discussion of the measurement models is limited; however, additional information can be provided upon request.

2.2.1 Measurement models

As in other social capital studies, factor analysis was used to create latent variables representing the components of social capital as defined above (see Jones, 2010; Mitchell & Bossert, 2007; Narayan & Cassidy, 2001), in addition to a measure representing 'sea turtle conservation attitudes.' Confirmatory factor analysis (CFA) allows for observed items to be tested as associated with each factor, ultimately reducing the number of variables to factors representing unobserved constructs. Owing to the use of these scales in previous research (with the exception of 'sea turtle conservation attitudes'), CFA was used instead of Exploratory Factor Analysis (EFA) in order to test previous theory related to the dimensions of social capital, not generate theory as is common with EFA. In addition, the use of CFA within structural equation modeling (SEM) allows the researcher to use the latent factors directly in analysis without computing factor scores and allows for more modeling flexibility for the inclusion of additional variables (Brown, 2010). In some cases the measurement models were modified by removing items based on theoretical and methodological issues, including model improvement. For example, some items were found to be weakly correlated and exhibited weak factor loadings. According to Brown (2010) factor loadings of > 0.3 are acceptable for applied research. Of the social capital components, social participation was not found to be a salient latent variable. However, one observed variable for social participation was used in the higher order factor for social capital. Other negatively or similarly worded items among the latent factors appeared to be influenced by method

effects based on highly correlated measurement errors. This was particularly evident in the latent factor for trust, where 7 of the 10 items were removed. Only one indicator was removed from civic participation and three from norms of collective action. The latent factor for sea turtle conservation attitudes was separated into two factors, one for beliefs and one for behaviors with five of the total 15 indicators being removed. However, only one factor representing sea turtle conservation attitudes was used in the SEM owing to the high residual correlation of one item in the second factor to all other items in both factors.[38] The residuals for two sets of items within the final factor were allowed to correlate based on modification indices and a review of the questions. A list of observed items identified (with factor loadings) for each measure can be found in Appendix B. A second order factor for social capital was constructed using the following latent variables: community participation, civic participation, collective action, trust and observed variables for social participation and group participation. Trust was not significant in the second order factor for social capital and was left as a separate latent variable.

All CFA models were conducted with M*plus* 7.0 software (Muthén & Muthén, 1998-2004) based on its ability to model categorical data using the robust weighted least squares (WLSMV) estimator. I tested the fit of the model using several criteria, including likelihood ratio chi-square statistic (preferring models where it is not significant), root mean square error of approximation (RMSEA ≤ 0.06), CFI and TLI (seeking 0.95–1.00), and weighted root mean residual (WRMR ≤ 0.95, closer to 1

[38] While the two factors were highly correlated to each other, a combined factor of all the items did not meet the fit criteria.

indicating good fit) (Brown, 2010). Although WRMR is still considered an experimental model fit criteria lacking significant research regarding cut off points (Yu & Muthén, 2002), I have included it here for the knowledge of the reader. Reliability scores for each scale were calculated with the SAS 9.3 software (SAS, 2010) using the method by Green & Yang (2009), an alternative to the traditionally reported coefficient alpha, that allows for nonlinearity among factors and item scores. Although the reliability coefficient for 'norms of collective action' is low, > 0.65 is considered acceptable (Vaske, 2008); the inclusion of this latent factor improved the model fit for the second order factor of 'social capital.' With only one missing response for social participation all available data was used to estimate the model, the default for dealing with missing data in M*plus*. Model fit measures and construct reliability for all latent variables are presented in Table 2.3.

Table 2.2 Model fit and construct reliability for measurement models (n=339)

Latent Variable	χ^2	**df**	**p-value**	**RMSEA**	**CFI**	**TLI**	**WRMR**	**α**
Social Capital	264.704	165	0.0000	0.042	0.947	0.939	0.905	-
Community Participation	27.294	9	0.0013	0.077	0.951	0.918	0.694	0.67
Civic Participation	23.542	9	0.0051	0.069	0.961	0.936	0.603	0.69
Norms of Collective Action	4.093	8	0.8486	0.000	1.000	1.033	0.279	0.50
Attitudes Sea Turtle Conservation	7.743	3	0.0516	0.068	0.997	0.989	0.271	0.70
Trust	2.020	1	0.1553	0.055	0.995	0.986	0.310	0.52

Note: CFA models with a non-significant chi-square statistic, a p-value > 0.10 or where χ^2 /df ≤ 3, are preferred. All models indicated acceptable or good model fit.

2.2.2. Structural equation model

Structural equation models estimate direct and indirect effects between latent and observed variables simultaneously, incorporating the measurement models in the overall structural model. Based on the latent factors above, a structural equation model (SEM) was constructed to analyze the relationship between social capital, sea turtle conservation attitudes and participation. Because trust was not significant in the higher order factor for social capital, it was included as a separate variable in the model. Again all models were tested with M*plus* version 7.0 (Muthén & Muthén, 1998-2004), allowing the use of continuous and categorical variables in the model. Owing to the fact that the data was treated as categorical, I report the standardized parameters for all models (Byrne, 2012). I tested the fit of the model using several criteria, including likelihood ratio chi-square statistic (preferring models where it is not significant or where $\chi^2/df \leq 3$), root mean square error of approximation (RMSEA ≤ 0.06), CFI and TLI (seeking 0.95–1.00), and weighted root mean residual (WRMR ≤ 0.95) (Brown, 2010). A full correlation matrix with correlations for each variable is included in Appendix C.

Although the initial model indicated good fit with the data ($\chi^2 = 508.927$, df = 366) with a RMSEA ≤ 0.06 and a CFI of 0.957, the latent variable for trust was not significant and exhibited high residual variance. Trust was therefore removed from the model for clarity, resulting in an improved model fit. The final model (Figure 2.2) explained 42% of the variance in sea turtle conservation participation. The latent variables for community participation, civic participation and norms of collective action represented 75%, 86%, and 54% respectively of the variance in the higher order factor for social capital, reinforcing the validity of this construct. Both social capital ($\beta = 0.392$, $p < 0.01$) and sea

turtle conservation attitudes ($\beta = 0.409$, $p < 0.01$) had a significant positive direct effect on participation in sea turtle conservation. The model also indicates that social capital and sea turtle conservation attitudes are slightly correlated. Gender and age were tested as covariates and found to both be significant but did not improve model fit. Only one community (Barra) was found to be significant. Model fit was negatively affected with the addition of gender and age when added individually to the model, as well as when added together. Furthermore, the addition of gender, age, and community of residence to the model only slightly increased the R^2 and slightly reduced the effect of social capital and sea turtle conservation attitudes on conservation participation. Appendix D presents the various models with covariates and the corresponding fit criteria. Because gender, age, and community of residence did not improve model fit, the second model was deemed to be the most parsimonious model and therefore only the results of the model in Figure 2.2 will be discussed.

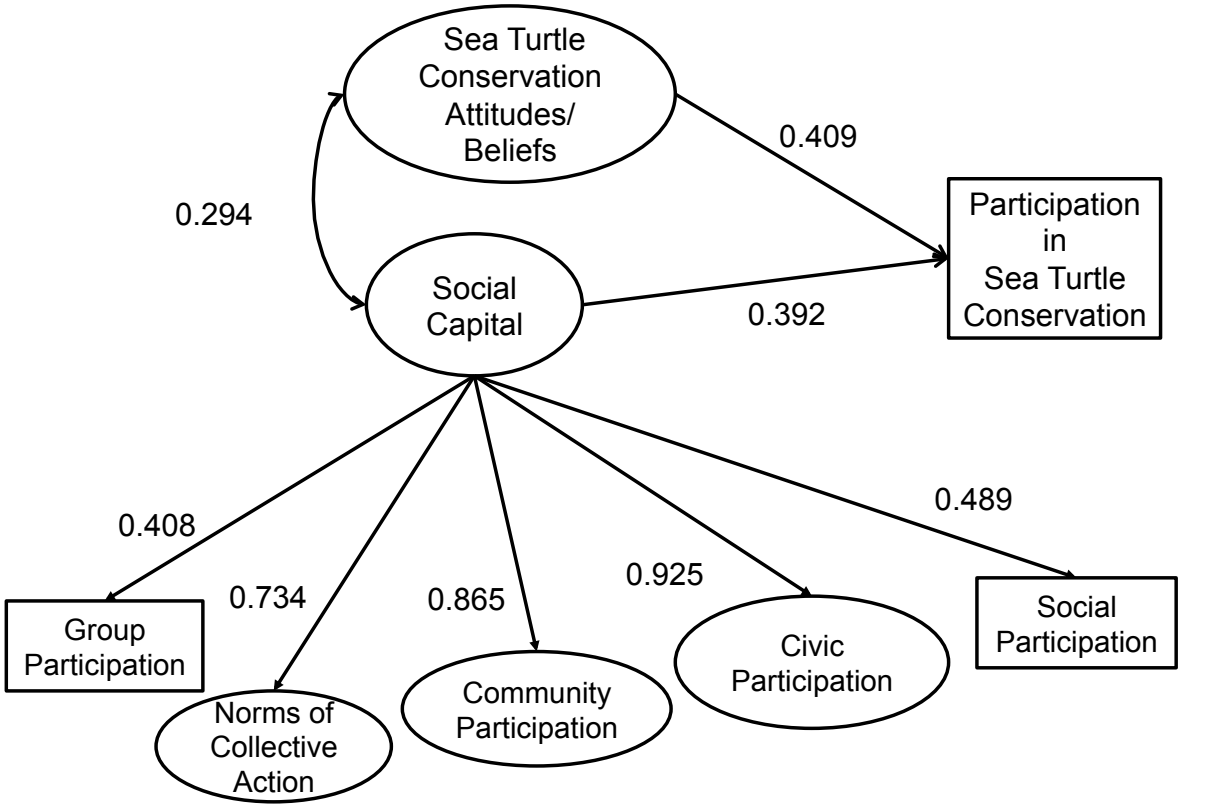


Figure 2.2 Results of structural equation model

Fit indices: χ^2 = 403.186, df = 290, RMSEA = 0.034, CFI = 0.964, TLI = 0.959, WRMR = 0.924.
All parameters reported are standardized. Circles represent latent variables and squares represent observed variables.

2.3 Discussion

This study examines the influence of social capital and conservation attitudes on participation in conservation using data collected from four coastal communities along the northeastern coast of the state of Bahia, Brazil. The results indicate that both social capital and conservation attitudes have a positive effect on participation in conservation, meaning that as social capital increases and attitudes become more positively aligned

with conservation, participation in sea turtle conservation increases. Additionally, social capital and conservation attitudes were positively correlated. This is important owing to the fact that despite little empirical evidence to support the attitude-behavior link (Herberlein, 2012), conservation efforts rely heavily on programs that aim to change individual conservation attitudes in order to increase participation either formally or informally through behavior change. The correlation between social capital and conservation attitudes, as well their equally positive influence on participation in conservation, provide further evidence that conservation attitudes are related to other aspects of community social structure. While it is possible that the relationships between attitudes and participation and social capital and participation could be interdependent, it is difficult to test both directions of the relationship with cross-sectional data and would be better suited for a longitudinal study with a larger sample size.

The findings presented provide strong support for civic and community participation and norms of collective action as social capital constructs, and further validate the conceptualization of social capital. However, trust was not found to be significant in the 2nd order factor for social capital, nor was it significant as an independent factor in the structural equation model. Thuy et al. (2011) also found trust not to be significant when examining the relationship between social capital and conservation attitudes around a protected area in Vietnam. Social trust, often viewed as the glue that holds groups together, can take generations to build and can be influenced by personal as well as institutional relationships. One explanation for why trust was not significant in this study may be that only social trust was measured, not institutional

trust, which could have had a different effect (see Jones 2010).[39] Because trust is an abstract construct, common conceptions of trust in the social capital literature center on two types: generalized trust (trust in people overall) and trust in particular people or groups of people (such as family, friends, and neighbors or people of the same religion or ethnicity) or institutions (such as the government, non-profits, police, etc.) (Groottaert et al., 2003; Narayan & Cassidy, 2001). Narayan and Cassidy (2001) recommend that questions regarding trust be tailored to the community being studied based on local context. More time in the study communities would have allowed for this. Furthermore, trust might need to be measured differently in Brazil and other countries where political corruption is high and levels of trust toward public institutions are low (Wike & Holzwart, 2008). Although data was not collected to measure political trust, during the time of data collection many people expressed their displeasure with the current mayor of the municipality and lamented the level of corruption in government—local, state and federal. Another factor possibly affecting the measurement of social trust in the communities studied is the increase of new and temporary residents from other parts of the state. A common theme in the interviews revolved around the changes to the community, such as the increase of crime and drugs over the years as tourism and second home development has increased. While cultural differences may provide an explanation for the varying significance of trust, it may also relate to Woolcock and Narayan's (2000) assertion that trust is not a measure of social capital but an outcome of the creation and maintenance of norms and networks over time. Therefore social capital could be low in these communities, resulting in low levels of trust. Whether

[39] Jones (2010) found trust (institutional and social) to be significant factors when measuring social capital and environmental activation in Greece.

viewed as an outcome or predictor, it is widely believed that trust is needed to maintain and build social capital (Berkes, 2009; Bouma et al., 2008; Cramb, 2005; Moore et al., 2006; and others), requiring that we view social capital as more of a dynamic process. Further, it is important to note that the measurement of social capital is still under much debate in the literature and can benefit from studies such as this. Finally, elucidation of this notion would benefit from longitudinal studies of community level social capital.

My main finding indicates that the general level of community participation and community norms of participation are just as influential as conservation attitudes in influencing participation in conservation. This signifies that just as much time needs to be spent engaging with the community and community organizations as working to increase awareness of sea turtle conservation. For example, it may be more beneficial (and efficient) for conservation programs to work through and with existing organizations to increase awareness, participation and support since the individuals participating are more likely to be open to calls for collective action and are accustomed to working together voluntarily for individual, familial and community benefit. Furthermore, by understanding how, where and why people participate in their communities, conservation staff can better tailor conservation programs to make them more accessible and attractive to community members. In the case of sea turtle conservation in the four communities studied here, this would require a more collaborative relationship with schools and fishers' associations that works to understand how these groups want to participate in sea turtle conservation. The program could also benefit from more of an attempt to connect with religious organizations and events that are targeted at families or all ages. Such integration with

other organizations would create a larger platform for information exchange and facilitate the creation of new networks or relationships. As discussed previously, social capital in relation to conservation is often examined and measured at the group level, for example a fishers' association or a group of stakeholders involved in park management. However, social capital at the group level only deals with direct stakeholders, or those already involved, and dismisses the larger social and institutional context. While studies at the group level are important for understanding and managing group dynamics, the approach used in this study provides a broader picture of social capital at the community level.

The positive influence of social capital on conservation participation leads to a logical conclusion that, if social capital is increased conservation participation will also increase. However, understanding how to build social capital is still widely debated in the literature. Increasing social capital requires supporting and building social structure, including formal and informal institutions (Berkes, 2009; Brune & Bossert, 2009; Pretty & Smith, 2003). This may be a precarious position for conservation managers at the community or regional scale due to local politics and power dynamics, not to mention limited resources and expertise in capacity building. While TAMAR does provide financial or in-kind support to different groups and organizations, more effort could be made to provide institutional support (training, facilitation, and assistance in connecting organizations to other available resources). Thuy et al (2011) came to similar conclusions in their study of social capital and conservation attitudes, suggesting that community protected area programs should work to provide more opportunities for interaction and participation among community members through existing formal or

informal organizations (p.151). De Souza Briggs (2004) notes that there is a need to understand “social capital under development,” which could provide a greater understanding of the creation and maintenance of social capital. Future research regarding the development of social capital would benefit most from in-depth qualitative studies in order to capture its dynamic and nuanced process (Grootaert et al., 2003).

While this study begins to answer some questions, it also creates new ones, such as: Where does participation in conservation fit into social capital? Is participation in conservation a type of community or civic participation? Conserving natural resources may be seen as a more formal civic responsibility to some, such as voting, while others may view it as a voluntary act that supports or contributes to the present and future well-being of the community. These beliefs, of course, may vary by place, culture and time. However, studies that examine only the social capital of groups involved in conservation and ignore the social capital at the community level may miss important issues related to social structure and norms of participation and collective action. The separate treatment of conservation from other forms of community participation, in both research and conservation, also perpetuates the view of conservation issues as separate from people’s social and economic lives. If conservation managers take account of aspects related to social capital and incorporate this information into their conservation planning, conservation participation may have a better chance of becoming integrated in formal and informal community institutions.

2.4 Conclusion

As development and urbanization continue, visitors to the area looking to escape hectic city life are venturing further to more remote communities and beaches that were

once safe nesting areas for sea turtles—free from human activity, lights, and motorized vehicles. The social and biological repercussions of this expansion will require enhanced community engagement that would benefit from long-term interdisciplinary study. The model presented can be used as a tool for analyzing the relationship between conservation and non-conservation related participation at the individual and community level; helping to inform community participation and conservation planning. Further examination of social capital could benefit community engagement in conservation by providing a “road map” of community social structure in order to elucidate the cognitive and structural connections between conservation and non-conservation participation, lending to the creation of more long-term and meaningful engagement. My study presents a novel approach to understanding the role of social capital in conservation participation and demonstrates the importance of non-conservation related participation to conservation.

APPENDIX

Supplemental Tables and Figures

Table A.1: Summary of Sample Demographics by Community

	Complete Sample	Sítio do Conde	Poças	Siribinha	Barra do Itariri
Women	58.1%(197)	28.3(96)	9.7(33)	6.5(22)	13.6(46)
Men	41.9%(142)	22.7(77)	6.8(23)	5.0(17)	7.4(25)
Age					
18 to 25	21.8%(74)	13.9(47)	2.4(8)	2.4(8)	3.2(11)
26 to 35	23.6%(80)	12.4(42)	4.1(14)	2.4(8)	4.7(16)
36 to 45	18.0%(61)	7.1(24)	3.2(11)	2.4(8)	5.3(18)
46 to 55	19.2%(65)	9.7(33)	4.1(14)	2.4(8)	2.9(10)
56 to 79	17.4%(59)	8.0(27)	2.7(9)	2.1(7)	4.7(16)
Respondent Income* (n=332)					
None	42.2%(140)	23.5(78)	6.6(22)	5.1(17)	6.9(23)
<1 minimum salary	25.3%(84)	8.7(29)	5.4(18)	3.9(13)	7.2(24)
≤2 m.s.	28.0%(93)	16.6(55)	4.5(15)	1.2(4)	5.7(19)
≤3 m.s.	2.1%(7)	1.2(4)	0.0(0)	0.3(1)	0.6(2)
≤4 m.s.	1.5%(5)	0.6(2)	0.3(1)	0.3(1)	0.3(1)
>4 m.s.	0.9%(3)	0.3(1)	0.0(0)	0.0(0)	0.6(2)
*1 minimum salary (m.s.)= R$540 or US$270)					
Household Income* (n=317)					
None	11.0%(35)	6.3(20)	1.9(6)	0.9(3)	1.9(6)
~1 minimum salary	19.2%(61)	7.9(25)	3.8(12)	2.5(8)	5.0(16)
~2 m.s.	30.9%(98)	15.8(50)	4.7(15)	3.5(11)	6.9(22)
~3 m.s.	12.9%(41)	6.6(21)	1.6(5)	1.3(4)	3.5(11)
~4 m.s.	14.8%(47)	8.5(27)	3.5(11)	0.9(3)	1.9(6)
>4 m.s.	11.0%(35)	5.0(16)	2.8(9)	1.6(5)	2.8(9)
*1 minimum salary (m.s.) = R$540 or US$270					
Government Benefits					
Yes	49.9%(169)	20.9(71)	11.5(39)	5.0(17)	12.4(42)
No	50.1%(170)	30.1(102)	5.0(17)	6.5(22)	8.6(29)

Table A.1 (cont'd)

Education					
None	7.7%(26)	2.1(7)	2.4(8)	1.2(4)	2.1(7)
Some primary	49.6%(168)	22.7(77)	11.2(38)	6.5(22)	9.1(31)
Some secondary	37.8%(128)	22.4(76)	2.9(10)	3.5(12)	8.8(30)
Secondary and higher	5.0%(17)	3.8(13)	0.0(0)	0.3(1)	0.9(3)
Profession					
None	11.2%(38)	8.6(29)	0.9(3)	0.0(0)	1.8(6)
Fisher	20.1%(68)	5.0(17)	8.5(29)	4.7(16)	1.8(6)
Domestic Worker	5.6%(17)	3.8(13)	0.3(1)	0.0(0)	1.5(5)
Retired	9.7%(33)	3.5(12)	1.5(5)	1.5(5)	3.2(11)
Household Mgr.	18.3%(62)	9.4(32)	2.1(7)	2.4(8)	4.4(15)
Teacher	4.7%(16)	3.5(12)	0.0(0)	0.6(2)	0.6(2)
Self-Employed	4.1%(14)	2.4(8)	0.9(3)	0.0(0)	0.9(3)
Merchant	4.1%(14)	2.4(8)	0.6(2)	0.0(0)	1.2(4)
Tourism/Service	3.8%(13)	2.1(7)	0.0(0)	0.9(3)	0.9(3)
Construction worker	2.7%(9)	1.8(6)	0.0(0)	0.3(1)	0.6(2)
Farmer	2.7%(9)	0.3(1)	0.0(0)	0.0(0)	2.4(8)
Student	2.7%(9)	0.3(1)	0.6(2)	0.9(3)	0.9(3)
Local government	2.1%(7)	1.8(6)	0.3(1)	0.0(0)	0.0(0)
Handyman	1.5%(5)	1.2(4)	0.3(1)	0.0(0)	0.0(0)
Taxi driver	1.5%(5)	0.9(3)	0.0(0)	0.0(0)	0.6(2)
Security guard	1.2%(4)	1.2(4)	0.0(0)	0.0(0)	0.0(0)
Artist	0.6%(2)	0.0(0)	0.3(1)	0.0(0)	0.3(1)
Caretaker	0.6%(2)	0.6(2)	0.0(0)	0.0(0)	0.0(0)
Various Other	2.9%(10)	2.4(8)	0.3(1)	0.3(1)	0.0(0)

*The lower sample size reflects respondents that preferred not to indicate their salary or the salary of other household members. Household income was calculated based on the respondent's admission of household member incomes.

A.2: Factor loadings for each observed item variable

Latent Variable	Observed Variable	Std. Factor Loading	S.E.	t-statistic	p-value
Civic Participation	Actively participate in an informational campaign.	0.681	0.057	11.849	0.000
	Participate in an election campaign.	0.654	0.061	10.679	0.000
	Participate in a protest or strike.	0.595	0.081	7.352	0.000
	Speak with the mayor or town representative to the mayor's office.	0.488	0.062	7.854	0.000
	Notify the police or courts about a problem in town.	0.602	0.062	9.700	0.000
	Participate in a community development meeting.	0.661	0.052	12.701	0.000
Community Participation	Actively participate in an association or group/organization.	0.537	0.062	8.603	0.000
	Speak with an influential person.	0.686	0.054	12.727	0.000
	Participate in a workshop.	0.540	0.063	8.539	0.000
	Speak with others about a problem in town.	0.556	0.061	9.128	0.000
	Donate money or materials to an association or group.	0.547	0.058	9.499	0.000
	Volunteer for a charity organization.	0.706	0.055	12.824	0.000
Trust	People here are only interested in their own well-being.	0.604	0.052	11.607	0.000
	Some people here are more trustworthy than others.	0.590	0.031	19.069	0.000
	Here people have to be alert or someone is likely to take advantage of you.	0.590	0.031	19.069	0.000

Table A.2 (cont'd)

Attitudes Sea Turtle Conservation **(Beliefs)**	The conservation of sea turtles is important for your family.	0.671	0.035	19.123	0.000
	You would like to participate in sea turtle conservation.	0.716	0.032	22.142	0.000
	You trust TAMAR to make decisions that benefit this town.	0.753	0.031	23.942	0.000
	The protection of sea turtles is important for fishers.	0.628	0.034	18.671	0.000
	You would like to know more about nature conservation.	0.693	0.035	19.614	0.000
Attitudes Sea Turtle Conservation **(Beliefs - Behaviors)** ***(Not Used in Model)***	Upon finding a sick animal on the beach you would notify TAMAR.	0.822	0.037	22.133	0.000
	Cars, motorcycles and four-wheelers or dune buggies should not travel on the beach at any time.	0.523	0.037	14.067	0.000
	TAMAR should talk with people here before making decisions about sea turtle conservation.	0.714	0.039	18.347	0.000
	Lights from houses and hotels on the beach can impede newly hatched sea turtles from reaching the ocean.	0.440	0.045	9.750	0.000
Collective Action	In the last year, how many times did people here organize to register a complaint or make a request of the mayor or the town's representative to the mayor?	0.431	0.080	5.393	0.000
	In the last year, how many times did you unite with others from this town in order to resolve a problem?	0.488	0.082	5.983	0.000
	Do you think that people here would contribute money toward a project to better this town?	0.416	0.075	5.542	0.000
	The leaders here bring people together to discuss decisions before making any decision about the progress of the town.	0.461	0.065	7.134	0.000
	In general, how would you classify the spirit of participation in this town?	0.473	0.073	6.436	0.000
	What level of influence do residents have on the development of the town?	0.535	0.069	7.801	0.000

Table A.3: Correlation Matrix

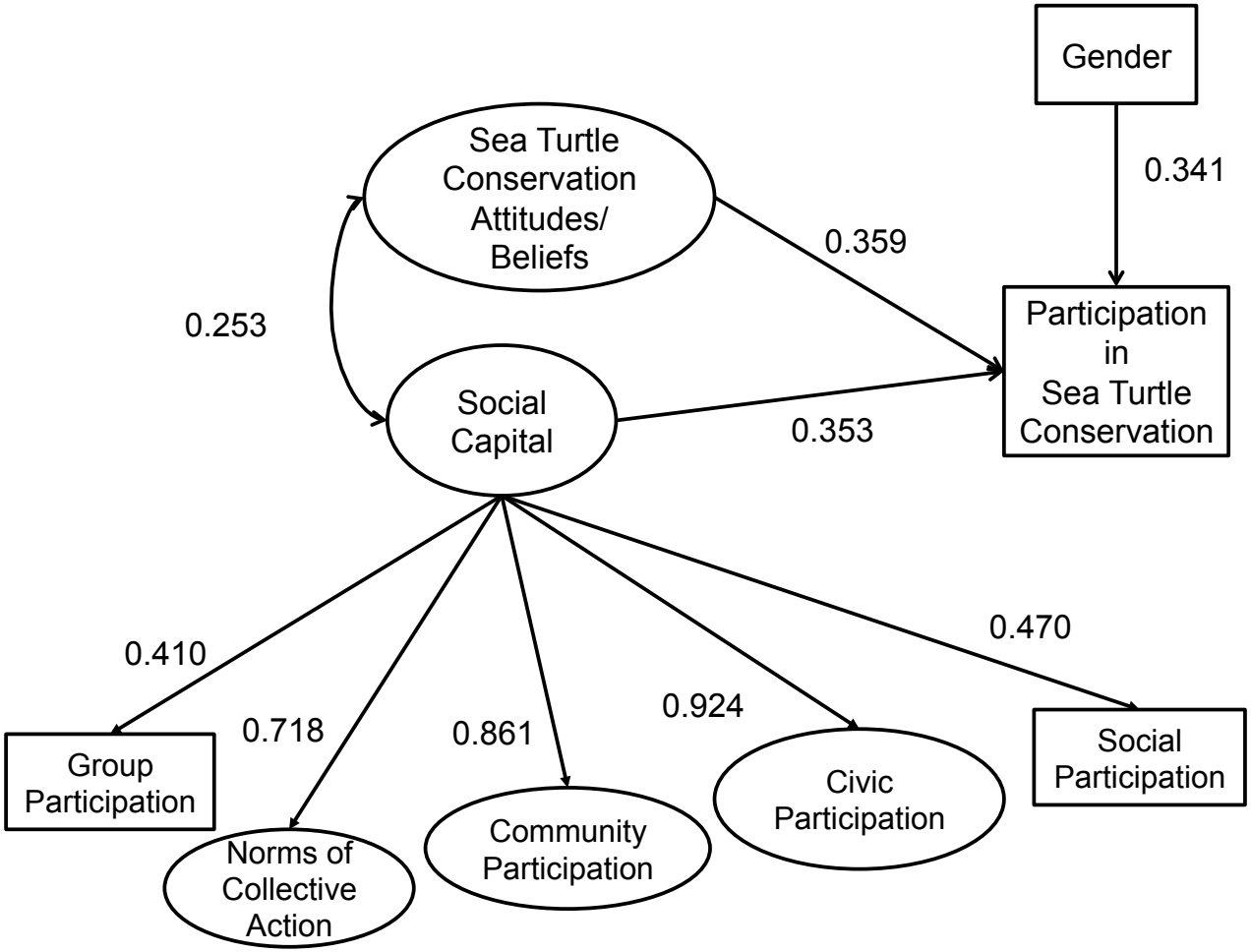
	COMPAR 1	COMPAR 2	COMPAR 3	COMPAR 4	COMPAR 5	COMPAR 6	CIVPAR 2	CIVPAR 3	CIVPAR 4
COMPAR1	1.000	0.426	0.164	0.281	0.294	0.408	0.445	0.197	0.305
COMPAR2	0.426	1.000	0.339	0.483	0.312	0.385	0.549	0.294	0.211
COMPAR3	0.164	0.339	1.000	0.330	0.349	0.429	0.339	0.177	0.397
COMPAR4	0.281	0.483	0.330	1.000	0.184	0.324	0.506	0.281	0.268
COMPAR5	0.294	0.312	0.349	0.184	1.000	0.481	0.404	0.203	0.247
COMPAR6	0.408	0.385	0.429	0.324	0.481	1.000	0.351	0.147	0.254
CIVPAR2	0.445	0.549	0.339	0.506	0.404	0.351	1.000	0.377	0.345
CIVPAR3	0.197	0.294	0.177	0.281	0.203	0.147	0.377	1.000	0.462
CIVPAR4	0.305	0.211	0.397	0.268	0.247	0.254	0.345	0.462	1.000
CIVPAR5	0.219	0.500	0.160	0.351	0.195	0.234	0.224	0.430	0.322
CIVPAR6	0.259	0.397	0.383	0.457	0.293	0.406	0.451	0.355	0.375
CIVPAR7	0.481	0.488	0.278	0.398	0.366	0.417	0.541	0.384	0.321
COACT1	0.246	0.333	0.101	0.151	0.130	0.177	0.286	0.229	0.292
COACT3	0.235	0.407	0.286	0.366	0.170	0.247	0.429	0.260	0.209
COACT5	0.138	0.123	0.076	0.177	0.151	0.246	0.252	0.195	0.078
COMDECIS	0.152	0.176	-0.022	0.156	0.021	0.156	0.115	0.048	0.004
PARTCOM	0.115	0.191	0.066	0.094	0.112	0.170	0.096	-0.063	0.008
COMINFLU	0.123	0.183	0.070	0.136	0.113	0.027	0.226	0.186	0.085
ATTSTC2	0.077	0.160	0.027	0.055	0.022	0.160	0.040	0.014	-0.031
ATTSTC5	0.148	0.234	0.152	0.076	0.074	0.155	0.164	0.137	0.086
ATTSTC8	0.059	0.097	0.056	0.036	0.026	0.072	0.086	0.122	0.099
ATTSTC9	0.097	0.156	0.058	0.114	0.021	0.055	0.052	-0.007	0.044
ATTSTC13	-0.021	0.217	0.238	0.112	0.097	0.089	0.106	0.125	0.164
SOCPAR4	0.111	0.323	0.211	0.423	0.294	0.201	0.308	0.242	0.120
TAMARPA	0.309	0.405	0.298	0.126	0.103	0.216	0.405	0.249	0.305
GRPPAR	0.451	0.253	0.119	0.137	0.325	0.342	0.258	0.139	0.027

Table A.3 (cont'd)

	CIVPAR5	CIVPAR6	CIVPAR7	COACT1	COACT3	COACT5	COM DECIS	PART COM	COM INFLU
CIVPAR6	0.291	1.000	0.381	0.333	0.389	0.059	0.073	0.015	0.074
CIVPAR7	0.278	0.381	1.000	0.359	0.451	0.133	0.170	0.157	0.120
COACT1	0.276	0.333	0.359	1.000	0.518	0.145	0.229	0.176	0.254
COACT3	0.304	0.389	0.451	0.518	1.000	0.228	0.220	0.197	0.277
COACT5	0.169	0.059	0.133	0.145	0.228	1.000	0.220	0.216	0.188
COMDECIS	0.153	0.073	0.170	0.229	0.220	0.220	1.000	0.217	0.211
PARTCOM	0.093	0.015	0.157	0.176	0.197	0.216	0.217	1.000	0.284
COMINFLU	0.200	0.074	0.120	0.254	0.277	0.188	0.211	0.284	1.000
ATTSTC2	0.109	-0.030	0.175	0.103	0.077	0.010	0.242	0.100	-0.029
ATTSTC5	0.100	0.166	0.232	0.181	0.137	-0.035	0.162	0.097	0.028
ATTSTC8	0.091	0.064	0.130	0.137	-0.004	0.049	0.178	0.067	0.101
ATTSTC9	0.105	-0.008	0.058	0.145	-0.005	-0.001	0.217	0.058	0.085
ATTSTC13	0.182	0.033	0.190	0.117	0.140	0.114	0.097	0.015	0.079
SOCPAR4	0.292	0.365	0.369	0.160	0.419	0.195	0.115	0.124	0.115
TAMARPA	0.175	0.250	0.425	0.231	0.292	0.130	0.054	0.218	0.171
GRPPAR	0.118	0.075	0.386	0.122	0.291	0.062	0.142	0.141	0.105

	ATTSTC2	ATTSTC 5	ATTSTC8	ATTSTC9	ATTSTC 13	SOCPAR 4	TAMAR PAR	GRP PAR
ATTSTC5	0.509	1.000	0.532	0.428	0.623	0.084	0.472	0.209
ATTSTC8	0.500	0.532	1.000	0.477	0.530	0.084	0.269	0.193
ATTSTC9	0.585	0.428	0.477	1.000	0.456	0.098	0.200	0.035
ATTSTC13	0.436	0.623	0.530	0.456	1.000	0.091	0.449	0.134
SOCPAR4	0.141	0.084	0.084	0.098	0.091	1.000	0.045	0.049
TAMARPA	0.377	0.472	0.269	0.200	0.449	0.045	1.000	0.308
GRPPAR	0.094	0.209	0.193	0.035	0.134	0.049	0.308	1.000

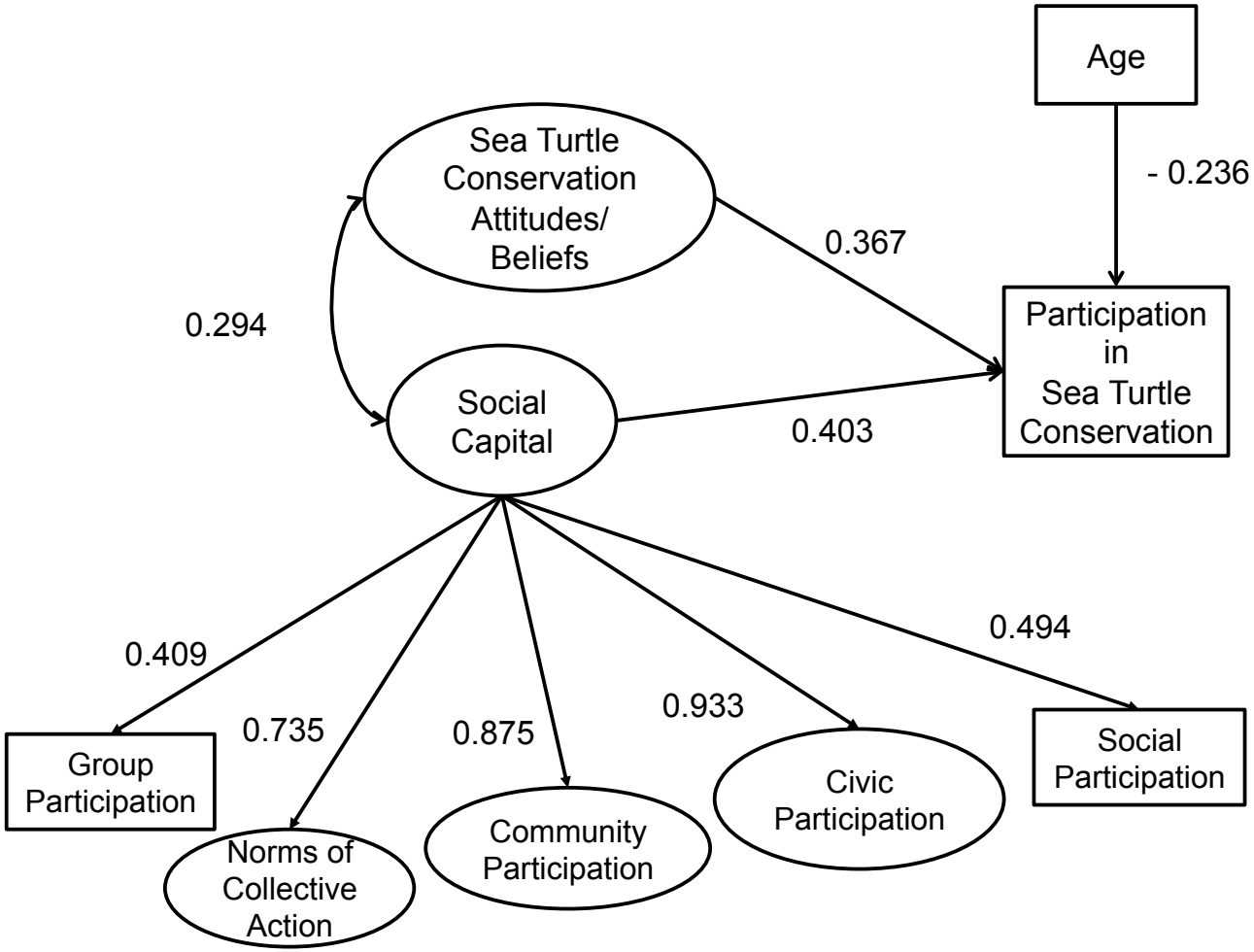
Figure A.1: Structural equation model with covariate 'gender'



Model fit criteria

χ^2 = 505.569, df = 316, p-value=0.000, RMSEA (0.042), CFI (0.936), TLI (0.929), WRMR (1.053), R^2 = 0.434

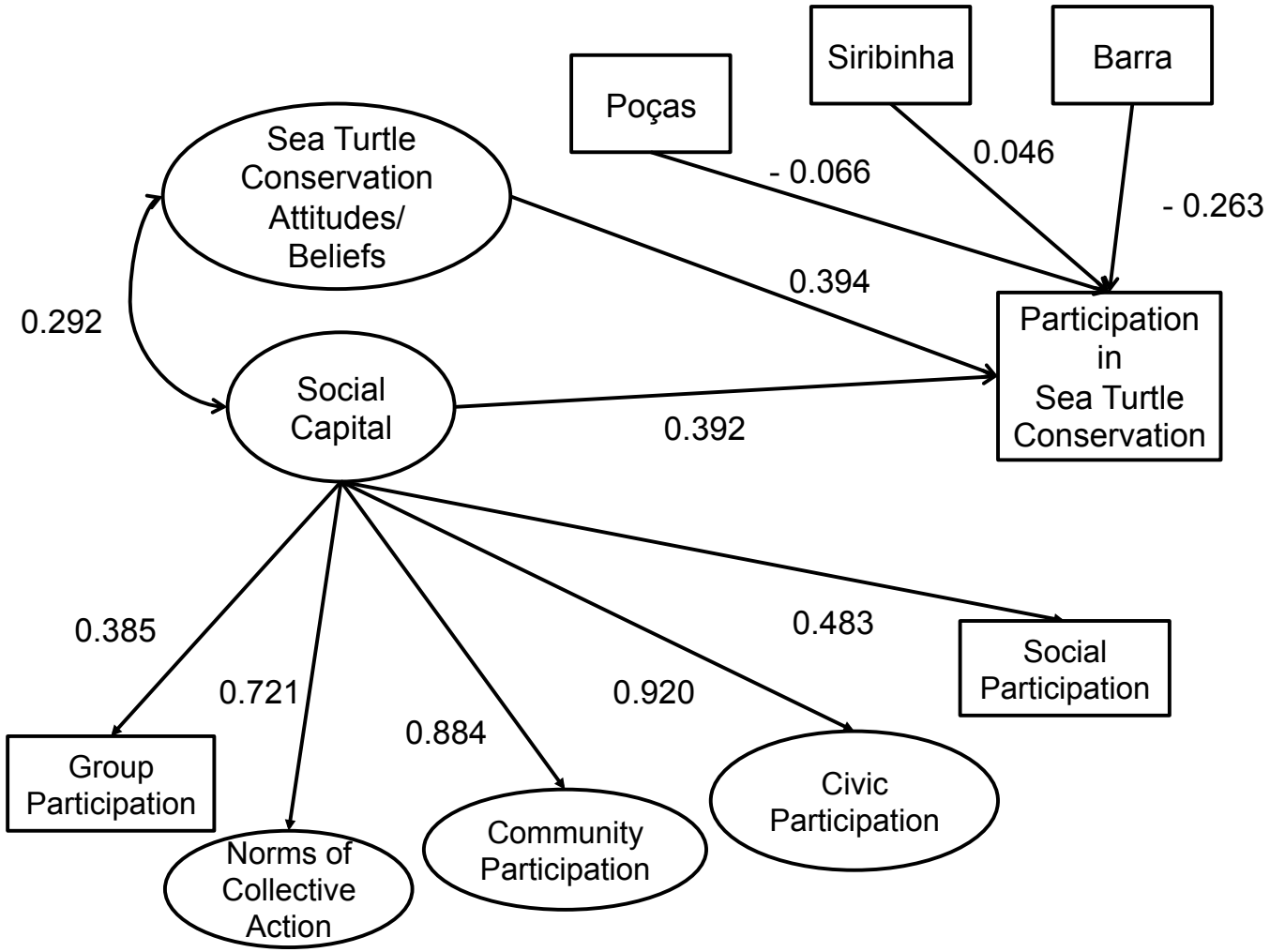
Figure A.2: Structural equation model with covariate 'age'



Model fit criteria

χ^2 = 468.844, df = 315, p-value=0.000, RMSEA (0.038), CFI (0.951), TLI (0.946), WRMR (0.996), R^2 = 0.439

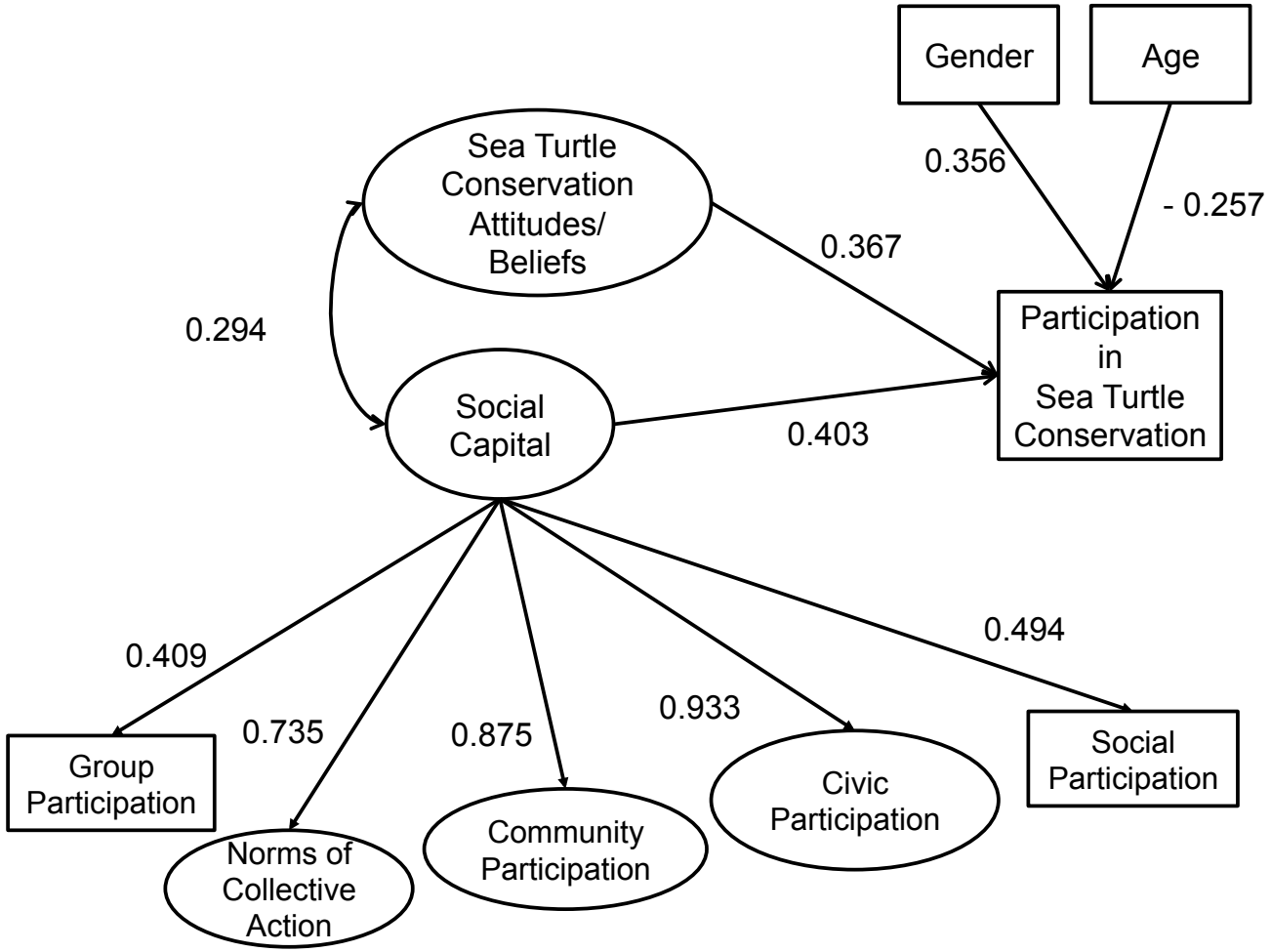
Figure A.3: Structural equation model with covariates 'community of residence'



Model fit criteria (Sítio do Conde is the reference group.)

χ^2 = 549.973, df = 365, p-value=0.000, RMSEA (0.039), CFI (0.942), TLI (0.936), WRMR (1.057), R^2 = 0.470

Figure A.4: Structural equation model with covariates 'gender' and 'age'



Model fit criteria

χ^2 = 570.514, df = 340, p-value=0.000, RMSEA (0.045), CFI (0.923), TLI(0.915), WRMR (1.111), R^2 = 0.467

REFERENCES

REFERENCES

Adam, F., & Rončević, B. (2003). Social Capital: Recent Debates and Research Trends. *Social Science Information*. *42*(2), 155–183. doi:10.1177/0539018403042002001

Agarwal, B. (2001). Participatory Exclusions, Community Forestry, and Gender: An Analysis for South Asia and a Conceptual Framework. *World Development*. *29*(10), 1623–1648. doi:10.1016/S0305-750X(01)00066-3

Agrawal, A. (2001). Common Property Institutions and Sustainable Governance of Resources. *World Development*. *29*(10), 1649–1672. doi:10.1016/S0305-750X(01)00063-8

Ballet, J., Sirven, N., & Requiers-Desjardins, M. (2007). Social capital and natural resource management a critical perspective. *The Journal of Environment & Development*. *16*(4), 355–374.

Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management*. *90*(5), 1692–1702. doi:10.1016/j.jenvman.2008.12.001

Bouma, J., Bulte, E., & Van Soest, D. (2008). Trust and cooperation: Social capital and community resource management. *Journal of Environmental Economics and Management*. *56*(2), 155–166. doi:10.1016/j.jeem.2008.03.004

Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research* (1st ed.). The Guilford Press.

Brune, N. E., & Bossert, T. (2009). Building social capital in post-conflict communities: Evidence from Nicaragua. *Social Science & Medicine*. *68*(5), 885–893. doi:10.1016/j.socscimed.2008.12.024

Byrne, B. M. (2012). *Structural equation modeling with Mplus: basic concepts, applications, and programming*. New York: Routledge Academic.

Coleman, J. S. (1988). Social Capital in the Creation of Human Capital. *American Journal of Sociology*. *94*, S95–S120. doi:10.2307/2780243

Cramb, R. A. (2005). Social capital and soil conservation: evidence from the Philippines*. *Australian Journal of Agricultural and Resource Economics*. *49*(2), 211–226. doi:10.1111/j.1467-8489.2005.00286.x

Creswell, J. W., & Plano, V. L. (2010). *Designing and conducting mixed method research*. Thousand Oaks, CA: Sage Publications.

De Souza Briggs, X. N. (2004). Social capital: easy beauty or meaningful resource? *Journal of the American Planning Association*. *70*(2), 151–158.

Duit, A., Hall, O., Mikusinski, G., & Angelstam, P. (2009). Saving the Woodpeckers Social Capital, Governance, and Policy Performance. *The Journal of Environment & Development*. *18*(1), 42–61. doi:10.1177/1070496508329302

Dulal, H. B., Foa, R., & Knowles, S. (2011). Social Capital and Cross-Country Environmental Performance. *The Journal of Environment & Development*. *20*(2), 121–144. doi:10.1177/1070496511405153

Fine, B. (2010b). *Theories of social capital researchers behaving badly*. London; New York; New York: Pluto Press ; Distributed in the United States of America exclusively by Palgrave Macmillan. Retrieved from http://site.ebrary.com/id/10479700

Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas, (Pró TAMAR). (2011). *Relatório de Atividades 2011*.

Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas, (Pró TAMAR). (2010). *Relatório de Atividades 2010*.

Grafton, R. Q., & Knowles, S. (2004). Social Capital and National Environmental Performance: A Cross-Sectional Analysis. *The Journal of Environment & Development*. *13*(4), 336–370. doi:10.1177/1070496504271417

Green, S. B., & Yang, Y. (2009). Commentary on Coefficient Alpha: A Cautionary Tale. *Psychometrika*. *74*(1), 121–135. doi:10.1007/s11336-008-9098-4

Grootaert, C., Narayan, D., Jones, V. N., & Woolcock, M. (2003). *Integrated Questionnaire for the Measurement of Social Capital (SC-IQ).* pp. 1–26. The World Bank.

Grootaert, C., & Van Bastelear, T. (2002). The role of social capital in development: An empirical assessment. *Cambridge Univ Press Cambridge*.

Grootaert, C., & Van Bastelaer, T. (2001). *Understanding and measuring social capital: a synthesis of findings and recommendations from the Social Capital Initiative*. Washington, D.C.; College Park, MD: World Bank, Social Development Family, Environmentally and Socially Sustainable Development Network ; Institutional Reform and the Informal Sector, University of Maryland, College Park.

Gutiérrez, N. L., Hilborn, R., & Defeo, O. (2011). Leadership, social capital and incentives promote successful fisheries. *Nature*. *470*(7334), 386–389. doi:10.1038/nature09689

Heberlein, T. A. (2012). *Navigating environmental attitudes*. New York: Oxford University Press.

Hodgkin, S. (2008). Telling It All A Story of Women's Social Capital Using a Mixed Methods Approach. *Journal of Mixed Methods Research*. *2*(4), 296–316.

Instituto Brasileiro de Geografia e Estatística (IBGE), (2010). Censo Demográfico 2010. Website http://www.ibge.gov.br/cidadesat/topwindow.htm?1, last accessed 03 June 2013.

Jin, M. (2013). Does Social Capital Promote Pro-Environmental Behaviors? Implications for Collaborative Governance. *International Journal of Public Administration*. *36*(6), 397–407. doi:10.1080/01900692.2013.773038

Jones, N. (2010). Environmental activation of citizens in the context of policy agenda formation and the influence of social capital. *The Social Science Journal*. *47*(1), 121–136. doi:10.1016/j.soscij.2009.05.008

Jones, N., Halvadakis, C. P., & Sophoulis, C. M. (2011). Social capital and household solid waste management policies: a case study in Mytilene, Greece. *Environmental Politics*. *20*(2), 264–283. doi:10.1080/09644016.2011.551032

Kramer, D. B. (2007). Determinants and efficacy of social capital in lake associations. *Environmental Conservation*. *34*(03), 186–194.

Krishna, A. & Shrader, E. (1999). Social capital assessment tool. *Prepared for the Conference on Social Capital and Poverty Bank, June* 22–24.

Lansing, D. (2009). The spaces of social capital: livelihood geographies and marine conservation in the Cayos Cochinos Marine Protected Area, Honduras. *Journal of Latin American Geography*. *8*(1), 29–54.

Macias, T., & Nelson, E. (2011). A Social Capital Basis for Environmental Concern: Evidence from Northern New England*. *Rural Sociology*. *76*(4), 562–581. doi:10.1111/j.1549-0831.2011.00063.x

Marcovaldi, M. A., Patiri, V., & Thomé, J. C. (2005). Projecto TAMAR-IBAMA: Twenty-five years protecting Brazilian sea turtles through a community-based conservation programme. *MAST. 3*(2) and *4*(1): 39–62.

Mitchell, A. D., & Bossert, T. J. (2007). Measuring dimensions of social capital: Evidence from surveys in poor communities in Nicaragua. *Social Science & Medicine*. *64*(1), 50–63. doi:10.1016/j.socscimed.2006.08.021

Moore, S. A., Severn, R. C., & Millar, R. (2006a). A Conceptual Model of Community Capacity for Biodiversity Conservation Outcomes. *Geographical Research*. *44*(4), 361–371. doi:10.1111/j.1745-5871.2006.00407.x

Múthen & Múthen. (1998-2004). Mplus Version 7.0.

Narayan, D., & Cassidy, M. F. (2001). A Dimensional Approach to Measuring Social Capital: Development and Validation of a Social Capital Inventory. *Current Sociology*. *49*(2), 59–102. doi:10.1177/0011392101049002006

Ostrom, E., Dietz, T., Nives, D., Stern, P., Stonich, S., & Weber, E. U. (eds.) (2002) *The drama of the commons*. Committee on the Human Dimensions of Global Change, National Research Council (U.S.), Washington, DC: National Academy Press.

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*,.*24,* 1-24.

Pretty, J., & Smith, D. (2004). Social Capital in Biodiversity Conservation and Management. *Conservation Biology*. *18*(3), 631–638. doi:10.1111/j.1523-1739.2004.00126.x

Pretty, J. (2003). Social Capital and the Collective Management of Resources. *Science*. *302*(5652), 1912–1914. doi:10.1126/science.1090847

Pretty, J., & Ward, H. (2001). Social capital and the environment. *World Development*. *29*(2), 209–227.

Projeto TAMAR-IBAMA. (n.d.). website, www.projetotamar.org.br, last accessed 01 May 2013.

Projeto TAMAR-IBAMA. (2004). Reporte annual 2004, Base de Sítio do Conde, Bahia, Brazil.

Putnam, R. D. (1993). The prosperous community; Social capital and public life. *The American Prospect*, *Spring*.

Putnam, R. D. (2000). *Bowling alone: the collapse and revival of American community*. New York: Simon & Schuster.

Rubin, H. J., & Rubin, I. S. (2005). *Qualitative interviewing: the art of hearing data* (2nd ed.). Thousand Oaks, Calif: Sage Publications.

SAS Version 9.3 (2010). Statistical Software.

Secretária do Meio Ambiente, Estado da Bahia, Brazil. (1992). APA Litoral Norte do Estado da Bahia, Decreto Estadual n° 1.046/92 de 17 de Março de 1992, http://www.meioambiente.ba.gov.br/conteudo.aspx?s=APALITOR&p=APAAPA, last accessed 03 June 2013.

Sekhar, N. U. (2007). Social Capital and Fisheries Management: The Case of Chilika Lake in India. *Environmental Management*. *39*(4), 497–505. doi:http://dx.doi.org.proxy2.cl.msu.edu/10.1007/s00267-006-0183-0

Thuy, N. N., Dwivedi, P., Rossi, F., Alavalapati, J. R. R., & Thapa, B. (2011). Role of social capital in determining conservation attitude: a case study from Cat Tien National Park, Vietnam. *International Journal of Sustainable Development & World Ecology*. *18*(2), 143–153. doi:10.1080/13504509.2011.560455

Vaske, J. (2008). *Survey Research and Analysis: Applications in Parks, Recreation and Human Dimensions*. Venture Publishing, Inc.

Wagner, C. L., & Fernandez-Gimenez, M. E. (2009). Effects of Community-Based Collaborative Group Characteristics on Social Capital. *Environmental Management*. *44*(4), 632–645. doi:10.1007/s00267-009-9347-z

Wandersman, A., & Giamartino, G. A. (1980). Community and individual difference characteristics as influences on initial participation. *American Journal of Community Psychology*. *8*(2), 217–228. doi:10.1007/BF00912661

Wike, R., & Holzwart, K. (n.d.). Where Trust is High, Crime and Corruption are Low. *Pew Global Attitudes Project*. Retrieved 26 May 2013, from http://www.pewglobal.org/2008/04/15/where-trust-is-high-crime-and-corruption-are-low/

Woolcock, M., & Narayan, D. (2000, August). Social capital: Implications for development theory, research, and policy. The World Bank Research Observer.

Yu, C. Y., & Múthen, B. O. (2002, April). Evaluation of model fit indices for latent variable models with categorical and continuous outcomes. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

CHAPTER 3

BEYOND FISHERMEN: GENDERED ASPECTS OF PARTICIPATION IN COMMUNITY LIFE AND SEA TURTLE CONSERVATION

3. Introduction

The complex role gender plays in society makes it an interesting and important focus for investigation, and often a standard variable used to understand differences in conservation participation and attitudes. However, the study of gender differences in conservation has led to mixed results and often controversy over the stereotyping (i.e., essentialization) of gender roles and relations. Although studies from the U.S. demonstrate higher environmental concern among women (Mohai, 1992; Stern et al., 1993; Xiao & McCright, 2012; Zelezney et al., 2000), studies from developing countries show little gender difference in conservation attitudes (Allendorf & Allendorf, 2012; Jacobs, 2002; King & Peravlo, 2010; White et al., 2011). Less is understood regarding the connection between attitudes and participation, and potential gender differences. In order to better understand gendered differences in conservation participation, a more comprehensive analysis could consider gendered aspects of social networks, public participation, economic activity, structure and individual agency (Cleaver, 2000), in addition to attitudes. Norris and Inglehart (2006) provide a framework that can better explain gendered patterns of participation by examining issues of structure (access), culture (attitudes), and agency. The structural aspects such as gender, age, and class often affect the distribution of and access to resources such as time, money, knowledge, and skills. Culture relates to the attitudes and values that motivate people to

participate and the particular organizations they choose to participate with. Finally, agency addresses the role of social ties and networks through families, friends, and colleagues that facilitate the recruitment of people to participate. These explanations for understanding gender differences in participation can be summarized as: can't, won't, and nobody asked them (Norris & Inglehart, 2006). This framework allows for the examination of gender within three important areas of conservation participation that are often studied individually, for a better understanding of the relationship between access (structural), attitudes (cultural) and agency in influencing conservation participation.

I chose to study gender differences in sea turtle conservation due to the traditional focus on men in studies of fishing communities and sea turtle conservation programs. Sea turtles are threatened primarily by hunting and incidental by-catch in open water or hunting and egg collection on the beach. Because the majority of open water fishers and hunters on land are men, sea turtle conservation programs are often targeted primarily at men. Despite the fact that women are often involved in fishing or fishing-related activities, gender roles in fishing communities were historically viewed using a land/sea and domestic/public dichotomy (Davis & Nadel-Klein, 1992). However, this conceptualization does not fully address the complexity of gender roles and relations in coastal communities at the community or household level. Gender roles in society still largely place domestic responsibilities, including childcare, with women. In some instances this can translate into more involvement in decision-making at the household level (Shields et al., 1996). This is important when considering that the household and family are where much of the socialization of children occurs (Buckingham-Hattfield, 2000), influencing values and beliefs regarding conservation, as

well as norms and motivation related to participation. Furthermore, women often fish in near-shore areas, rivers, lakes, and mangroves and have various opportunities for coming in contact with wildlife—including sea turtles and sea turtle eggs.

Based on gender differences in participation and environmental concern found in the literature, I sought to analyze how and why these differences exist in sea turtle conservation using a mixed methods approach. This research examines the gender differences in sea turtle conservation participation and whether gender differences in access, attitudes and agency provide sufficient explanation for these differences. In the first section I review the literature on gender, participation, and conservation attitudes, followed by a description of methods and results. Quantitative data presented establishes the context, offering an overview of gender differences in participation (both conservation and non-conservation) and conservation attitudes in the study area, while qualitative data bring voice to the differences and similarities, highlighting the relationship to conservation. The integrated quantitative and qualitative results provide a more comprehensive examination of gender differences in participation and the issues surrounding access, attitudes and agency. Finally, I summarize the main findings and discuss the implications for understanding gender differences in conservation participation using this framework.

3.1 Gender differences in participation in conservation and community life

Worldwide, women have shown increased participation in environmental organizations and movements compared to men, particularly when the issues are local and/or related to the health and well-being of their family (see Caiazza & Gault, 2006; Cruz-Torres & McElwee, 2012; Hochstetler & Keck, 2007; Tindall, 2003). The general

explanation for increased participation comes from a common assertion that women are more concerned for the environment because of an inherent biological closeness to nature and altruistic character stemming from women's reproductive role as caregivers and nurturers (Buckingham-Hatfield, 2000; Jackson, 1993; Rocheleau, 1996; Shiva, 1989). However, this biological deterministic, or essentialist, standpoint does not acknowledge the multiple factors influencing gender differences in conservation, such as division of labor, social norms based on the cultural construction of gender roles and responsibilities, issues of power and influence in gender relations, and differential access to resources (Agarwal, B., 1997; Ogra, 2007; Rocheleau, 1996). Moreover, it fails to consider men's and women's needs and priorities within the sociopolitical context (Meinzen-Dick & Zwarteveen, 2001).

Although interest can be an important motivator for participation, access to resources such as time, money, knowledge and skills affect the type and level of participation among individuals. These resources are also often limited to certain members of society based on structural inequalities related to gender, age, class, ethnicity and education. Studies of gender differences in participation in community life in the United States have shown that men are more likely to participate or volunteer with groups that involve sports and recreation, whereas women are more likely to volunteer in areas related to health, social services, and education (Lowndes, 2006; Norris & Inglehart, 2006). These findings, while seemingly essentialist, may also be a consequence of structural constraints in time, skills, and knowledge as women are choosing to volunteer in areas that address multiple aspects of their roles and responsibilities in daily life. Furthermore, women often do not distinguish between

participation in community activities and their domestic roles, and are less likely to self-identify as being active participants (Lowndes, 2006). Knowledge and skills can further inhibit participation by men and women, especially in developing countries where education levels may be low and opportunities for attaining valuable communication and organizing skills are non-existent. Therefore, access to these resources enables communities or members of communities to take better advantage of opportunities to participate and make the most of their participation.

Gender differences in conservation participation, such as community-based natural resource management (CBNRM) and similar initiatives,[40] expose the differential access to natural resources and impact of unequal participation in conservation projects on various groups in society (Agrawal, 1997; Cornwall, 2003). Di Ciommo and Schiavetti (2012) found that gender differences in participation in a marine protected area in Brazil were affected by women's limited access, support, and benefits. Because of gender differences in fishing production, where women are considered assistants and often do not get paid, men were more likely to benefit from attending management meetings and workshops that addressed aspects of fishing only relevant to men. However, it is also important to note that in fishing communities where fishers may be out at sea for days or a week, men's participation is also limited and dependent on women fulfilling other duties at home and in fish production. Nonetheless, increased access to participation isn't always a benefit. The essentialization of women as being caretakers of family and community, in addition to their supposed closeness to nature,

[40] Natural resource management is used to represent the management of forests, water, soil, etc., while community conservation refers to programs addressing biodiversity or species conservation.

has also made them targets for conservation and development projects that see women as candidates for voluntary (unpaid) work, taking for granted the cost of participation in lost labor and time for daily household activities (Agrawal, 1997; Cornwall, 2003; Molyneux, 2002). This can also be true for both men and women in subsistence communities. The failure to recognize and respect people's time can lead to strained relationships between organizations and community members.

3.2 Gender differences in conservation attitudes

Two theories frequently used for explaining gender differences in quantitative studies examining environmental concern are socialization and social roles theory (Blocker & Eckberg, 1997). Socialization theory states that women are socialized from childhood to be more compassionate, cooperative, emphatic, and caring while men are socialized to be competitive, independent, and unemotional. Similarly, social roles theory relates to the productive and reproductive roles that men and women perform, such as economic provider and family nurturer. Overall, research has shown modest support for socialization theory, with women demonstrating slightly higher levels of environmental concern than men (Mohai, 1992; Stern et al., 1993; Xiao & McCright, 2012; Zelezney et al., 2000). Additionally, women may be more interested in local environmental issues or those related to health and safety (Blocker & Eckberg, 1989). However, this does not always translate into greater activism, as some studies have shown that men are more likely to be active in environmental organizations (Mohai, 1992; Tindall et al., 2003).

It is also important to acknowledge that the majority of studies investigating gender differences in environmental attitudes are Western based, or from the North.

Non-Western-based studies of attitudes toward conservation initiatives and environmental issues have found more mixed results and less significant gender differences. For example, Jacobs (2002) did not find any significant difference for gender, age, income and education in a study of environmental attitudes and activism in Brazil. Similarly, a study of attitudes toward parrot and sea turtle conservation in the Dominican Republic concluded that gender differences in attitudes only existed regarding consumptive use, with women more approving of the use of sea turtles for jewelry or decoration and parrots as pets (White et al., 2011). Abd Mutalib et al. (2013) attribute greater awareness of sea turtle conservation issues by men in Malaysia to men's involvement in fishing and women's lack of time and opportunities outside the household. Allendorf and Allendorf (2012) found significant gender differences regarding perceptions of a protected area only when controlling for socio-economic characteristics, with women exhibiting slightly more positive attitudes attributed to possible environmental concern. However, they felt that the responses from women might have been influenced by social bias or the tendency of women in developing countries not to offer negative opinions (Atkeson & Rapport, 2003). Conversely, King and Peralvo (2010) credited gender differences in conservation perceptions to the gendered nature of livelihoods in South Africa, along with formal education and length of time in the community. Despite the varying context of these studies, socialization and social roles remained important considerations for examining gender differences in attitudes and perception in my research.

3.3 Gender, agency and social networks

Women's involvement in church-related activities is very common throughout Latin America, including Brazil, and has historically brought women into social and environmental movements (Hochstetler & Keck, 2007; Molyneux, 2002). Social networks, through organizations such as faith-based groups, can serve to mobilize and recruit participants (Norris & Inglehart, 2006) or facilitate an individual's ability to benefit from participation (Belsky, 2003). Social networks, however, are not gender neutral and gender differences in formal and informal social ties can shape how and where people participate (Norris & Inglehart, 2006). As a result of socially ascribed roles in public and private spheres, the household has often been considered a gendered space where women might be able to obtain and exert more agency than in the public sphere (Shields et al., 1996). However, without linkages to networks in the public sphere, opportunities and motivations to participate may be constrained. For example, Anthony et al. (2004) found that men were more often invited to participate in wildlife management decision-making by a wildlife management agency than women, and noted this as a motivator for participation.

Because women are socially embedded in family and community through involvement in reciprocal support networks and associational life, they often have different social networks than men (Molyneux, 2002). Men are generally considered to participate more frequently in the public sphere, specifically in areas of politics and the economy, whereas the private sphere can be viewed as an extension of the household and women's domestic work and reproductive labor. Research in the US and Canada has indicated that membership in organizations is gender segregated, with

organizations such as faith-based or parent-teacher groups being disproportionately female and athletic, professional and business-related organizations predominately male (Caiazza & Gault, 2006; Norris & Inglehart, 2006). Part of the explanation comes from the finding that men spend more time with coworkers and friends, whereas women spend more time with family and other relatives—thereby shaping their social networks and exposure to formal associations. Gender segregated participation can isolate women from opportunities in the public sphere and reinforce gender roles. Participation in the public sphere is important because it is where people from different backgrounds can interact, share experiences and ideas, form a sense of self and community belonging (Cornwall, 2004). In a study of citizen participation in wildlife management decision-making in the U.S., women considered the open exchange of ideas and unbiased facilitation as the most important aspects of the process (Anthony et al., 2004).

Even when women take on roles designated as male, such as participating in the public sphere or working in male dominated fields, gender relations are frequently maintained (Silvey & Elmhirst, 2003). Gender relations are associated with issues of power and influence, meaning that greater involvement by women in male-dominated circles does not always translate into greater access, influence, agency or voice in these circles. Previous research in Brazil demonstrated that although women were allowed to participate in meetings related to the marine protected area, women's participation and voting was controlled by their husbands and led women to feel that their needs were not recognized and their participation was not valued (Di Ciommo & Schiavetti, 2012). Therefore, participation alone cannot address power dynamics

embedded within structure, culture and agency. Likewise, although gender is useful for analyzing social relationships, it is vital to remember that women and men as a group are not homogeneous, but positioned in society by class, ethnicity/race, age, and other socio-economic factors. Consequently, not all women (or men) share the same stake or bear the same risks in environmental protection (Agarwal, B., 1997). These and other aspects of an individual's identity can affect the ability and willingness to participate, which can change over time as their social position changes (Cleaver, 2001). Although my study does not specifically address the various intersections with gender, I acknowledge their significance in conservation issues and the need for more research in this area.

3.4 Methodology

3.4.1 Data collection

Data was collected using a mixed-methods approach involving the collection of quantitative and qualitative data through household questionnaires and focus groups (Creswell & Plano, 2010). Mixed methods incorporates both inductive and deductive logic in the research cycle, allowing for tailored development and expansion of data collection and the examination of overlapping aspects of a phenomenon, increasing the scope of the project (Tashakkori & Teddlie, 1998). Household questionnaires were used to provide a broad overview of gender differences in conservation and non-conservation participation and attitudes toward sea turtle conservation. Focus group discussions with participants from community groups permitted further exploration and investigation of the gender differences in motivations, benefits, and barriers to participation, as well as how people want to participate in conservation. All research instruments were pre-

tested in the field and revised as appropriate. Informed consent was used to ensure voluntary participation and confidentiality. The Michigan State University Committee on Human Subjects (IRB No. x11-208) approved the methods for this research for the duration of the project.

Household Questionnaire. The household questionnaire was adapted from the Social Capital Assessment Tool (SOCAT)[41] used by the World Bank (Krishna & Shrader, 1999). This instrument has been tested in various countries around the world, increasing its validity and providing a reliable base for this study. Additional questions focusing on attitudes, knowledge and participation in sea turtle conservation were included in the questionnaire for the purpose of my study. The questionnaire consisted of five sections: (1) demographic information about household members (income, age, gender, education, profession, and government benefits); (2) housing characteristics (ownership, type of housing, electricity, water, sanitation, and garbage collection); (3) knowledge and attitudes toward the environment and conservation programs; (4) community organizations, participation and collective action; and (5) trust and cooperation. Each section was constructed of a mix of open- and close-ended questions, including Likert scale and similar rating type questions.

The questionnaires were administered orally in Portuguese in or near the respondent's home and averaged 30 minutes in duration. Oral consent was obtained prior to beginning the questionnaire and only respondents 18 years of age and older were interviewed, one per household. A non-probability sampling frame was employed

[41] Survey and interview instruments for SOCAT can be found at http://go.worldbank.org/KO0QFVW770

based on the difficulty of finding people in their homes during culturally appropriate times for visiting (i.e., outside of meal and resting times), as well as limitations in financial and human resources and access conditions to the study sites.[42] This sampling frame helped to reduce gender bias in the sample, as women are more often found at home and men outside of the home. Interview days and times were also varied in order to reach a variety of people in or near their homes, while not disrupting daily activities. Interviews were conducted Monday through Friday between 9:30 and 11:30am and 2:30 and 5:30pm and two Saturday afternoons for the community of Sítio do Conde. In the communities of Poças, Siribinha, and Barra do Itariri, interviews were only conducted during the afternoons due to lack of transportation and difficulty encountering men at home during the morning hours as they were often out fishing or sleeping after having fished early in the morning. Women were also often occupied with preparing lunch or doing chores around the house during the morning hours as well, making the afternoon more convenient and less intrusive.

Focus Groups. Focus groups were employed to further explore the motivations and benefits to participation among participants of established community groups, as well as

[42] A stratified random sample by neighborhood was attempted but proved unsuccessful based on the limited times people were available in their homes as well as in obtaining a fair representation of men and women in the sample. In the larger community of Sítio do Conde the sample was still stratified by neighborhood, however the other three communities were small enough that they only consisted of one main street (Poças and Siribinha). In the case of Barra do Itariri the issue of transportation and time, as well as a higher rate of refusal to participate, impeded attempts to accurately stratify the sample. Although Barra do Itariri has a small population it is spread out over a larger area that physically separates segments of the community. All segments of the community were visited except for the cluster of houses located farthest from the coastline along the highway. This area of the community is inhabited less by fishers and people that would have had any contact with TAMAR or TAMAR activities, which was low in general among community members in Barra do Itariri.

the obstacles to participation, and understand how participants would like to participate in conservation. Morgan (1988) notes that focus groups can create more emphasis on the participants' point of view by reducing interaction with the interviewer and replacing it with interaction among participants. In order to increase validity, member checks were also used during the discussion to clarify responses and ensure that all participants' views were represented by repeating or summarizing what had just been said and asking if all participants agreed with the statement or had any additional information or opposing statements to add (Denzin & Lincoln, 2005). Five focus groups were conducted with an average of 6 participants per group. Participants were members from established existing community organizations including: the fishers' association, artisans' association, churches, youth organization, and soccer club in order to bring together people with a shared common interest (Krueger & Casey, 2000). The groups were segregated by gender with 2 groups of all-male[43] and 3 groups of all-female participants in order to provide an open environment where both men and women would feel comfortable expressing their opinions (Montell, 1999). Focus groups lasted an average of one hour and were digitally recorded. Two female research assistants also took handwritten notes independently from each other.

3.4.2 Data analysis

The combination of qualitative and quantitative data collection and analysis supplements our knowledge by allowing for breadth and depth in understanding

[43] The focus group with the fishers' association did have 2 female participants; however, one woman arrived at the end of the session and did not make a single comment. The other woman left early, but did participate in the beginning. Her comments were separated out and are represented here along with the comments from other women.

participation, as well as increasing validity through triangulation (Creswell & Plano, 2010). I employed both quantitative and qualitative analysis of the data, beginning with descriptive statistics of the questionnaire data using SPSS statistical software followed by qualitative analysis of the focus groups. Chi-square tests were used to investigate the relationship between gender and age, income, education, community participation and conservation participation. Mean scores and standard deviations were calculated by gender for sea turtle conservation attitudes. Descriptive statistics regarding gender differences in participation and attitudes offer the context for understanding how the findings from the focus groups fit into the larger picture.

The qualitative data collected from the focus groups was used to further explore gender differences in participation, both conservation and non-conservation related, based on participants' experiences with community groups and TAMAR. Digital recordings and notes from focus groups were systemically coded using Dedoose 4.5 (2013), an online qualitative software program. Analysis began with open coding of the data, using the schedule of questions as a guide in marking main themes. A second round of coding involved creating sub-categories based on the participants' own words (Miles & Huberman, 1994). All codes were reviewed to identify and merge any repetitive categories and organize themes. A codebook was developed with descriptions of each parent and child code, with examples from excerpts, and used in a final round of deductive coding of all five focus groups. Notes from the focus groups were also analyzed and used for clarification of excerpts and to settle any discrepancies in the

transcription of excerpts. Only sections used for direct quotation were transcribed in Portuguese and then translated into English.[44]

3.4.3 Description of study area and participants

This study was conducted along Brazil's northeastern coast, where Projeto TAMAR (here after referred to as TAMAR), the national Brazilian sea turtle conservation program, monitors 44 km[45] of coastline containing prime nesting beaches for the olive ridley (*lepidochelys olivacea*), hawksbill (*eretmochelys imbricata)* and loggerhead (*caretta caretta*) sea turtles. In addition to monitoring, TAMAR engages in various activities surrounding *sensibilização* (awareness raising) and environmental education, presentations and expositions, and financial or other support to community associations or activities. Over its more than 30-year history TAMAR has released an estimated 15 million turtle hatchlings into the ocean nationwide, attributing their success to increased monitoring, support from communities, and heightened awareness of sea turtle conservation by fishers and beachgoers (Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas [Fundação Pró TAMAR], 2010 & 2011; Marcovaldi, Patiri, & Thomé, 2005). The four communities encompassed within the monitoring area are representative of coastal fishing communities along Bahia's northern coast, ranging in size from 500 to 2500 year-round residents (Instituto Brasileiro de Geografia e Estatística [IBGE], 2010). However, the influx of tourists during the summer months of

[44] All of the analysis, transcription, and translation was conducted by me unless otherwise noted.

[45] The TAMAR research base in Sítio do Conde also manages what is considered a 'sub-base' in Mangue Seco which is only staffed by TAMAR during the reproductive season (October–March). This adds an additional 41 km of beach, resulting in a total of 85 km for the TAMAR research station in Sítio do Conde.

November through March, which coincides with the reproductive and nesting cycle of sea turtles, can double the local population and provides a significant economic boom for year-round residents.

While fishing remains an important aspect of life for many residents, providing the main or supplemental income and food source for many families, tourism services including food, beverage, lodging, cleaning, and construction continue to grow in the area. Despite the increasing demand of tourists in the summer months, many residents find it necessary to seek employment in larger cities throughout the state and country. Men primarily find work in construction, food service or retail and women as domestic workers cooking and cleaning for wealthier families. Life in the communities is fairly tranquil outside of national holidays that are marked with parades, loud music, dancing and drinking. The beach is host to several recreational activities including surfing, swimming, playing soccer, walking, running and even recreational fishing. Men are more likely to be seen engaging in recreational activities on the beach, playing dominoes, or drinking in the square in the evenings than women; however, young women and girls can be seen cruising the beach and square in small groups. Women, especially those with children or grandchildren, can often be found in the home fulfilling domestic duties and tending to home-based income generation activities (e.g., preparing baked goods or crafts for sale) or seated out front of the home visiting with family members and neighbors, sometimes shelling crab for sale in the market.

Of the 339 questionnaire respondents, 197 were women and 143 were men.[46] The most common professions among respondents were: household manager (18.3%), ocean fisher (11.8%), and mangrove/river fisher (8.3%). Also, 11.2% of respondents did not indicate a profession and 9.7% were retired. Women were primarily represented within household managers (31.5%), mangrove/river fishers (13.7%), no profession (11.2%) and domestic workers (9.6%). Professions represented primarily by men included: ocean fishers (26.8%), retired[47] (14.8%), and no profession (11.3%). Income level was low among both men and women, with 52% of men and 28% of women indicating no individual monthly income. The lower percentage of women indicating no monthly income can most likely be attributed to Brazil's *bolsa familia* program, which provides a monthly stipend to mothers for keeping their children in school. Education level was also low with half of the entire sample having only completed some primary schooling, 52% for men and 47% for women. Age and income had a statistically significant association with gender; however, education did not. Table 3.1 presents descriptive statistics for the total sample and by gender. Demographic characteristics of my sample are representative of the actual population according to the 2010 census (IBGE, 2010).

[46] Sítio do Conde (n=174), Poças (n=57), Siribinha (n=39), and Barra do Itariri (n=71). Two questionnaires were incomplete, missing half or more of all responses, and therefore removed from the sample leaving a total sample size of n=339.

[47] Male respondents were primarily retired from fishing.

Table 3.1 Sample demographics by gender

	All Respondents (n=339) %	**Men (n=142) %**	**Women (n=197) %**	**p-value from χ^2**
Men	42.0			
Women	58.0			
Age				0.020
18 to 25	21.8	20.3	23.9	
26 to 35	23.6	23.4	23.9	
36 to 45	18.0	23.4	10.6	
46 to 55	19.2	19.3	19.0	
56 to 79	17.4	13.7	22.5	
Respondent Income* (n=332)				0.000
None	42.2	52.3	28.1	
<1 minimum salary (m.s.)	25.3	26.4	23.7	
≤2 m.s.	28.0	18.7	41.0	
≤3 m.s.	2.1	2.1	2.2	
≤4 m.s.	1.5	0.5	2.9	
>4 m.s.	0.9	0.0	2.2	
(1 m.s.= R$540 or US$270)				
Government Benefits (Yes)	49.9	33.1	61.9	0.000
Education				0.427
None	7.7	8.1	7.0	
Some primary	49.6	51.8	46.5	
Some secondary	37.8	36.5	39.4	
Secondary and higher	5.0	3.6	7.0	

*A few respondents declined to provide their income.

3.5 Findings

My presentation on the findings begins with the descriptive gender differences in conservation and non-conservation participation from the questionnaire, followed by the findings from the focus groups that address the issues of access and agency involved. The final section reports findings regarding gender differences in attitudes toward sea turtle conservation, followed by the discussion.

3.5.1 Gendered participation, access and agency

The gender differences in participation were mixed, with women participating more in community groups (non-conservation related) and men participating more in sea turtle conservation. Although there was not a statistically significant association between gender and group participation, women's participation in community organizations was slightly higher than men's participation (56.3% and 43.8% respectively, Table 3.2). However, of those respondents who participated in a community group, women were significantly more likely to consider themselves active members and men were significantly more likely to consider themselves leaders in the organization. This is possibly a result of the organizations that women and men participate in and their opportunities for leadership roles, in addition to availability of time to assume leadership roles. The groups that people most often participated with were the fishers' association (15.4%) and a religious group (19.1%). Men were more likely to have participated in the fishers' association (23.2% men, 8.1% women) and women were more likely to have participated in a religious group (20.8% women, 8.5% men). When asked who participates in the community (refer to Table 3.2 for response categories), less than a third of men and women felt that neither participate and more than a third believed that men and women participate equally.

Table 3.2 Gender differences in participation

	All Respondents (n=339) %	Men (n=142) %	Women (n=197) %	p-value from χ^2
Variables				
Community Group Participation (yes)	47.2	49.3	45.7	0.511
Active Member (yes) (n=159)	83.6	90.0	78.7	0.055
Leader (Yes) (n=159)	33.3	41.4	27.0	0.055
Who participates? (n=336)				
Men	9.8	11.3	8.7	0.051
Women	6.0	3.5	7.7	
More women than men	10.4	15.6	6.7	
More men than women	14.9	14.2	15.4	
Men and women equally	35.7	36.2	35.4	
Neither participate	23.2	19.1	26.2	
Participation Sea Turtle Conservation (yes)	37.5	53.5	25.9	0.000
Type of Participation (n=124)				0.542
Presentation	41.9	50.0	36.8	
Hatchling release	31.5	27.1	34.2	
Both	15.3	12.5	17.1	
Other	11.3	10.4	11.8	
Why haven't participated? (n=101)‡	59.4	63.6	57.4	0.656
Never invited	23.8	18.2	26.5	
Didn't know could participate	16.8	18.2	16.2	
Other				

‡Respondents were first asked if they knew of TAMAR, before being asked if they had participated in a conservation activity through TAMAR. If they responded 'no,' the set of questions regarding participation was skipped including the question as to why they haven't participated.

In regards to conservation participation, 37.5% of the total sample (n=339) indicated having participated in a TAMAR sponsored sea turtle conservation activity or event in the past (53.5% men and 25.9% women). Because of the heavy emphasis of outreach to fishers through presentations at formal meetings, it was not surprising that more men have participated with TAMAR or that gender was significantly associated

with sea turtle conservation participation ($\chi^2 = 26.89$, p-value < 0.01). Men were slightly more likely to have participated in a presentation than women, while women were slightly more likely to have participated in a hatchling release on the beach. When asked if they would participate again the response was nearly unanimous, with 98% of women and 97% of men declaring that they would participate again (n=124). For those who indicated that they had never participated (n=101), the most common response among women and men was that they were never invited (59.4%). However, women (26.5%) were more likely than men (18.2%) to say they didn't know they could participate.

Responses from the participants in the focus groups mirrored these results, as the men were more likely to have participated and the all-women groups cited the rationale for not participating in sea turtle conservation as not being invited, or "ninguém chama." Participants from the fishers' association had received presentations on various occasions but were less likely to have participated in a hatchling release. Similarly, the soccer club had been invited to participate in a beach clean-up and other activities but only a few indicated that they had participated. All respondents indicated a desire to participate in conservation and listed various environmental issues in addition to sea turtle conservation that should be addressed in the community such as pollution in the lagoon and river, trash on the beach, storm/sewer drains, deforestation of the mangroves, and land clearing through burning. Although TAMAR staff often lamented the lack of interest and awareness in conservation along local residents, my findings suggest that many are aware and concerned about a variety of conservation issues. It is important to point out that aside from TAMAR, the only other organization in the area

that addresses environmental issues, and commonly considered responsible for dealing with some of the issues listed above, is the Secretary for the Environment in the Mayor's office. However, dissatisfaction with the mayor's office was a recurrent theme throughout data collection. As a result, many residents expect a federally supported organization such as TAMAR to tackle various environmental concerns and see the organization as representing all things related to the environment, particularly because of the affiliation with the Brazilian Institute of the Environment and Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis—IBAMA).

The community associations chosen for the focus group discussions reflect the gender differences found within the questionnaire results and are representative of the main groups functioning in and serving the communities in the study area.[48] Participation among women is high with religious groups, and only women participate in the artisan association and the parent group for the youth association. Participation in the fishers' association is predominantly male and the soccer club is currently only open to men. Both men and women noted an overall gender difference in participation, specifically that women participate more in the community in general with the exception of the fishers' association. However, the fishers' association was recently mandated by the state to have half of all leadership positions held by women and increase their overall representation. This will be challenging for some families where both the man and woman fish, and although both may be members of the association, it is common

[48] While the associations represented in the focus groups are open to residents in all of the communities within the study area, the majority of participants in the focus groups were current residents of only one community.

for only one member of the household to attend meetings so that other responsibilities at home can be met.

Gendered access to resources, such as time, represents one type of structural explanation for gender differences in participation cited by study participants. Focus group participants expressed 10 barriers or challenges to participation (Figure 3.1), many of which can apply to both conservation and non-conservation related participation. Barriers identified by both men and women were: interest, individualism, time and money. Both time and money are structural issues that can affect access, while interest and individualism relate more to attitudes and beliefs toward participation in general and will be discussed further in the following paragraph. Time was considered a greater issue for women and money for men. Women commented on their inability to leave the home because of responsibilities related to cooking, cleaning and childcare. Both women and men agreed that women can also lack support from their families to be involved in groups outside the home; however, they also felt this has improved over time. Money was more of an issue for men because the types of groups that they were involved with required a financial investment of some kind. Women also identified lack of information, lack of opportunities, and the closed nature of groups as significant barriers to participation. Participants felt that most groups were not open to everyone and that the people involved or running the program only told people they liked about opportunities. For example, one woman remarked that “for some it [the challenge] is time, lack of interest, or even the lack of publicizing… when someone sees [an opportunity] for the community…they only give those that are close [relatives or friends] to them and for those that have the ability [financial or otherwise] a chance and

not for those who need it… the weak are left out." Women were often seeking out opportunities for themselves or family members to earn extra money or learn a skill that could lead to income generation, in addition to activities to enrich the lives of their children. While TAMAR is involved with income generation programs for women and youth in other coastal communities, at the time of data collection there were no such programs sponsored by TAMAR in the study area. However, TAMAR did provide some financial support to community groups for special events by request.

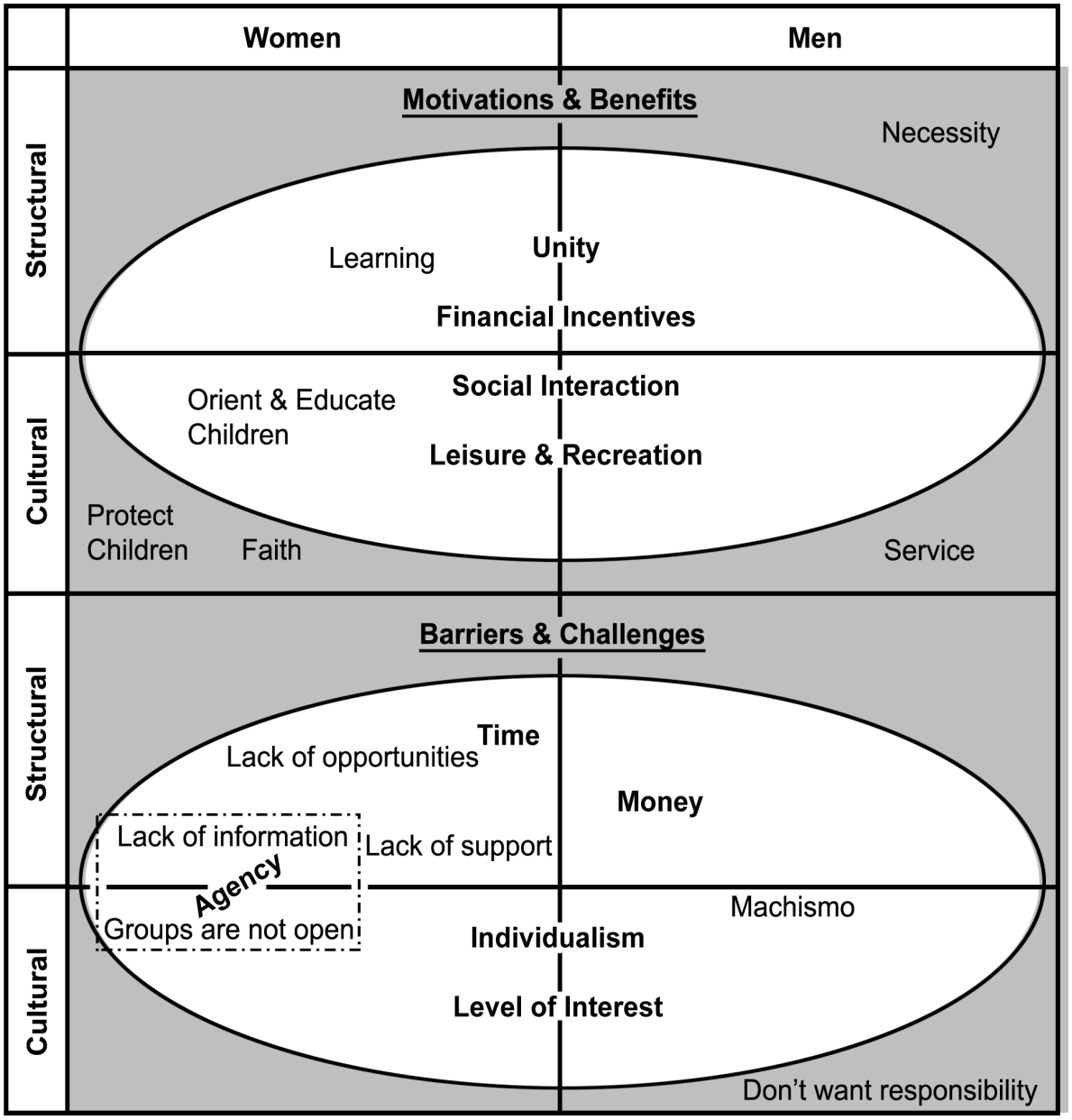


Figure 3.1 Characterization of gendered motivations and challenges to participation

*Items in the grey area outside of the circle were only mentioned by one group, and therefore not included with the other themes that were mentioned by more than 3 of the 5 groups.

In addition to the structural barriers discussed above, focus group participants felt that the low level of participation in the community stemmed from a general lack of interest in participating and the 'individualistic' nature of many residents. It was

mentioned several times during the focus groups that people in the community were “muito individual” or individualistic and only concerned about themselves. A few explanations were given for this, including the higher economic level of some residents that allowed them to be more independent and not rely on community groups. Class differences were obvious in the community as people with cars never walked to the town square for social events and rarely took public transportation. Neighborhoods were also somewhat segregated and people with more money often lived in houses that were surrounded by high walls and sometimes guard dogs. However, the majority of the community was of the same economic means, leading to other explanations. One respondent stated that some people don’t see the advantage or value of participating, while others believed that people “only participated if they were going to receive something.” While the fishers’ association had the largest turnout for the focus group (n=11), many of them agreed that participation at meetings was low compared to their membership numbers. A leader of the fishers’ association felt that “there are fishers that don’t like to participate. They come to the association when it is time to collect their benefits or to receive a ‘cesta básica’ [a package usually containing beans, rice, salt, sugar, oil, and other basic food staples] but if we need them to participate in something that benefits the entire association they don’t come.” This was a common sentiment among TAMAR staff as they often had better turnout at presentations for the fishers’ association if they raffled off t-shirts or provided food. One person referred to this as “t-shirt conservation” and felt that TAMAR had created an expectation over the years that made it difficult to ensure participation without such an incentive. It could be argued that the t-shirt is not what attracts participants, but the raffle itself considering that culturally

people tended to enjoy raffles and having the chance at winning. In fact, many events often included some type of raffle and I observed that people were more excited to have won something in a raffle (even at events where everyone was guaranteed to receive something) than be given an item.[49] Conversely, the example given above regarding the distribution of food staples is more a reflection of the low economic level of community members and demand for assistance in meeting basic needs.

The barriers to and motivations for participation identified are closely linked to agency in general, providing some obvious explanations for gender differences. For example, lack of information regarding opportunities can be the result of a lack of social networks or the existence of primarily gender segregated networks. Two women, who had only lived in the area for a few years, noted that there was a lack of opportunities, while at the same time commenting that they were not aware of many groups and didn't know many people in the community. Conversely, the soccer club had been invited to participate in a beach clean up and other conservation-related activities by two TAMAR staff that were also members of the soccer club. Because of men's social and professional networks they are more likely to be invited to participate or belong to a group, and in this case conservation activities. Women can also be motivated by their social networks to participate, as were the women in the artisan association who were nearly all friends, neighbors or relatives. However, this also restricts the variety of

[49] Throughout my time in the communities and especially toward the end, I gave many small presents to those I had befriended or people who had helped with my research in some way. Many of these gifts were souvenir type items from the university (pens, magnets, t-shirts, water bottles, etc.), nothing too different than what TAMAR raffles off at events. Although many people were grateful, I was often disappointed in the reaction I received. This was the most apparent at my farewell gathering when I distributed gifts to TAMAR staff and their families. In retrospect I probably should have given them out through a raffle, even if everyone won.

activities and groups they may be invited to participate in or are exposed to. All focus group participants indicated that they had friends or family members that also participated in the community group. Although male study participants may face less structural and agency-related barriers to participation than the female study participants, women from the artisans' group and the parent group for the youth association felt that men's participation in those groups was inhibited by 'machismo,' or societal pressure to conform to male stereotypes. They commented that there are men who are artists or who cook, but won't participate in an artisan group of all women or help prepare food for events that their children were participating in through the youth association because of 'machismo.'[50]

Women's motivations for participation in this study focused more on learning and supporting their families (providing education and opportunity for their children or learning a skill that could help them earn extra money), and social interaction (getting out of the house, meeting new people, or spending time with family and friends). However, social interaction was an important motivator for both men and women, as much of their community participation serves the dual purpose of providing leisure and recreation alongside personal, familial, or community benefit. Men and women were also equally motivated by financial benefits to participation and fostering unity within the community. Unity was the most surprising benefit and motivator that both men and women identified throughout the focus group discussions. Participants felt that they benefited from the unity of the group, or "união," stating that "united they achieved what

[50] However, there were gay men in the communities that owned restaurants or worked for wealthier families as cooks as they were not expected to conform to masculine traits and were often considered (or expected to be) more feminine.

they could not alone" and "unity provides strength." The theme of unity and collaboration was also mentioned when discussing what activities or programs TAMAR could or should carry out in the community. In regards to participation with TAMAR, one respondent stated, "participation is necessary…each one doing their part and thinking about the collective." While a number of activities were listed (such as presentations, campaigns, beach cleanups, youth groups, etc.) participants also stated that they wanted TAMAR to organize programs that helped to unite the community by collaborating with other groups, such as the ones they belonged to.

3.5.2 Gender differences in attitudes toward sea turtle conservation

The questionnaire showed overall positive attitudes toward sea turtle conservation for both men and women, with men having slightly higher mean scores for all questions (Table 3.3). However, since responses were positively skewed for all questions this difference is minimal and may be attributed to the fact that men have had more exposure to TAMAR and sea turtle conservation or to social desirability bias. Men may also have had more opportunities to benefit from participation or interactions with the project through t-shirt raffles or equipment exchanges (nets and hooks that reduce incidental by-catch) if they are affiliated with the fishers' association. Fishers also receive priority for monitoring jobs, and at the time of data collection all monitoring staff were men. The TAMAR base in the area employed one woman, whose responsibilities included cooking for staff and events, as well as cleaning the TAMAR research station and offices. Because monitoring the beaches requires staff to ride their bikes or walk long stretches of deserted beaches in the early morning hours, this job would probably be considered unsafe for a woman. However, there are often females interns during the

reproductive season that participate in monitoring, but are usually accompanied by another staff member.

Table 3.3 Mean responses for conservation attitudes

	All Respondents (n=339)	Men (n=142) μ/SD	Women (n=197) μ/SD
Attitudes—Sea Turtle Conservation			
The conservation of sea turtles is important for your family	4.21 (0.577)	4.33 (0.660)	4.12 (0.619)
You would like to participate in sea turtle conservation	3.98 (0.893)	4.22 (0.764)	3.80 (0.940)
You trust TAMAR to make decisions that benefit this town	4.09 (0.776)	4.18 (0.839)	4.02 (0.721)
The protection of sea turtles is important for fishers	4.20 (0.721)	4.23 (0.829)	4.18 (0.634)
You would like to know more about nature conservation	4.04 (0.791)	4.12 (0.855)	3.98 (0.739)
Upon finding a sick animal on the beach you would notify TAMAR	4.33 (0.577)	4.44 (0.589)	4.25 (0.557)
Cars, motorcycles and four-wheelers or dune buggies should not travel on the beach at any time	4.25 (0.777)	4.36 (0.845)	4.18 (0.717)
TAMAR should talk with people here before making decisions about sea turtle conservation	4.16 (0.844)	4.27 (0.818)	4.07 (0.854)
Lights from houses and hotels on the beach can impede newly hatched sea turtles from reaching the ocean	3.97 (1.014)	4.19 (0.982)	3.81 (1.010)

Participants in the focus group discussions also had positive attitudes toward sea turtle conservation, with the general consensus being that it was important for the community—both ecologically and socially. While participant attitudes were positive

toward sea turtle conservation, and they felt the presence of TAMAR was important, participants in 4 of the 5 groups felt the project was lacking in certain areas and did not function as it had in the past. One respondent noted, “TAMAR is doing their job correctly and well, but lacks more integration with our community.” A few participants mentioned that TAMAR used to organize more creative and fun events that involved the broader community, and not just the schools or fishers’ association. Questionnaire results reflected a similar sentiment with responses to open-ended questions that stressed the need for “mais presença,” or more presence, meaning there was a desire for TAMAR to be more present in community life as well as organizing more activities. This included collaborating more with other community groups, organizing more community-wide events, promoting their activities more, and increasing visibility through posters or a permanent interpretative exhibit.

3.6 Discussion

Access, attitudes and agency provide a useful framework for examining the role of gender in conservation participation. Gender itself did impose a structural barrier to conservation participation based on the gender-segregated nature of the fishers’ association; however, other issues of access and agency appeared to be more relevant. The lack of conservation outreach to groups other than the fishers’ association ensures that very few women will have the opportunity to participate in sea turtle conservation, despite their involvement in near-shore fishing and influence on decision-making in the household. Furthermore, as younger generations forgo fishing to seek employment in larger cities (Stronza & Pêgas, 2008), outreach to the fishers’ association will reach a smaller percentage of residents. Nonetheless, gender segregation was found across

community groups and reflects previous findings in the literature regarding the influence on social networks in mobilizing and recruiting participation. In general, participants in the community groups represented by the focus groups were friends, neighbors or relatives of other members. The downside of the close-knit nature of these groups (and social networks) is that they can become exclusive, making it difficult for newcomers to learn of the group, be invited to participate and integrate into the group (Ballet et al., 2007; Portes, 1998).

While men or women may be invited to participate in various activities based on their gender role in society, both men and women make the decision to participate or not based on the resources available to them (ONeill & Gidengil, 2006). Other structural barriers that affected women's access specifically included time and knowledge. Women's time constraints, along with lack of information regarding opportunities, have a significant impact on participation. Di Ciommo and Schiavetti (2012) also found time and knowledge to be a significant barrier for women's participation in marine conservation along the southern coast of Bahia in northeastern Brazil, with women more likely to indicate that they had never been invited and were often not provided information about activities or meetings in time. Although age and class were not addressed in this study, it is reasonable to conclude that both can also influence participation in conservation. TAMAR's focus on school children obviously creates an age bias in participation, which could be addressed by more family-oriented events. Class can further impede participation given that limited resources must be divided up to address a wider array of issues that take precedence over conservation issues (Mohai, 1992). This is especially evident in terms of participation with the fishers' association. Numerous men and

women fish for subsistence but are unable to pay the dues required (or acquire the proper documents) to belong to the fishers' association, making it less likely that they will receive conservation messages or other benefits. Similar to other gender studies, Di Ciommo and Schiavetti (2012) concluded that the challenges women confront are largely representative of the broader community and therefore, if addressed, would benefit all underrepresented groups and not just women.

Attitudes toward sea turtle conservation were overall very positive for both men and women; however, general community participation was low, and participants in the focus groups believed that many people did not see the value in participation or were too individualistic. Therefore cultural barriers related to people's attitudes and values toward participation, not conservation, may also affect participation in sea turtle conservation. Culturally, individual conservation actions, such as picking up garbage, are viewed as the responsibility of the local government. This is not unique to these communities. Jacobs (2002) found that Brazilians reported low levels of individual environmental activity but high level of group environmental activity as compared to Europeans. However, if attitudes toward participation discourage people from participating in groups then the likelihood of knowing someone who actively participates will also be diminished. This in turn affects agency, given that the more people you know who participate the more likely you are to participate. Findings from the focus groups illustrate this point, owing to the fact that many of the participants were neighbors, friends or relatives. Low levels of participation coupled with lack of information regarding opportunities and the closed nature of groups or activities in the community presents obstacles for both men and women, and little motivation.

My findings indicate that issues of access and agency can explain some of the gender differences in conservation participation. At the same time, I found little gender difference in attitudes toward sea turtle conservation to explain any gender differences in participation. While there is equal desire to participate in sea turtle conservation, women face greater structural and agency barriers than men. These findings are similar to those found in the literature from developing countries. Additionally, overall participation (conservation and non-conservation) was found to be low among both men and women. The focus groups provided interesting insights into people's attitudes, motivations, and barriers to participation and conservation. Future research would benefit from similar discussions with small groups of men and women to further explore gender differences in motivations and barriers to participation, as well as perceptions of participation (both conservation and non-conservation). Because of limited resources, an all-female focus group for the fishers' association and an all-male faith-based focus group were not conducted, but could provide valuable information to further validate gender differences in participation across groups. In addition, follow-up interviews with focus group participants could be conducted to provide more in-depth discussion of certain issues that because of efforts to respect participants' time were not pursued during the focus groups. Follow-up interviews may have also allowed some participants to speak more freely, although the focus groups did generate discussion that seemed to encourage participants to offer a lengthier response than the open-ended questions presented in the questionnaire. Future research should also examine gendered aspects of fishing in the area to better understand the needs and priorities of all fishers and the relationship to sea turtle conservation.

Additionally, focus group discussions pointed to varying motivations for participation among both men and women that provide more insight into conservation participation in general. Table 3.4 presents the benefits and motivations for participation as stated by focus group participants in relation to the suggested conservation activities compiled from both the questionnaire and the focus group responses. My analysis demonstrates how conservation activities align with different motivations for participation, helping to understand why certain people participate more than others. Additionally, this characterization highlights the concentration of conservation activities surrounding learning and the need for more activities that would serve the needs and interests of the broader community. It is important to note that while learning was an important motivator for women, this was often in reference to learning a skill or gaining knowledge that helped improve their well-being. General conservation awareness programming currently does not meet these objectives to learning but could be altered to include such aspects. Both men and women expressed interest in activities that provided social interaction, promoted unity, and a larger presence of sea turtle conservation in the community. This is very positive and encouraging for the future of sea turtle conservation in the area but should also serve as a warning that without increased involvement residents could become disenchanted, jeopardizing conservation efforts.

Table 3.4 Relationship of motivations for participation to suggested conservation activities

Motivations for Participation	Conservation Participation
Learning	Create Awareness • Presentations** • Campaigns • Expositions • Permanent interpretative exhibit*
Leisure & Recreation	• Nature Walks • Movies or videos (Cine TAMAR)
Social Interaction	• Parties or festivals • Expositions
Orient & Educate Children	• Youth Group • Workshops or projects that involve youth* • Hold competitions and award prizes (e.g. *gincanas*)
Financial	Enforcement** • Fines • Compensation (monetary or equipment based for fishers) Create jobs*
Unity	• Community wide activities (i.e. beach clean up)** • Integrate better into community • Collaborate with other groups • Have more presence in the community**

*items only mentioned by questionnaire participants

**items mentioned by both questionnaire and focus group participants

3.7 Conclusion

Gender differences in conservation participation can be influenced by many factors, including access to resources that enable participation (such as time, knowledge and skills), attitudes toward conservation and the act of participation itself,

and the facilitation of access to opportunities through social networks. A few conclusions can be drawn in regards to gendered aspects of participation that can have direct and indirect impacts on conservation participation. First, my findings indicate that men and women's participation in conservation is more likely a result of access and agency than attitudes. While improving attitudes and awareness of sea turtle conservation is important, it may not be enough to encourage participation. Second, men currently have more access to opportunities and information regarding sea turtle conservation, making them more likely to participate. Because of the gender-segregated nature of community organizations in the study area, the simple solution may appear to be increased outreach to women through faith-based or parent groups. However, women face greater time and support barriers to participation, meaning that increased outreach may only place additional burdens on women. One possible recommendation would be to create programs that target families, encouraging both men and women to participate. In communities with little access to economic resources, providing a source of family entertainment that is also educational may meet the needs of conservation and the community.

Other interesting and useful findings that were not directly gender related included calls for increased integration by TAMAR into the community, collaboration between community organizations and other efforts to increase unity throughout the community. Unity was an important aspect of participation for both men and women, and something that respondents felt was important for them individually and collectively. They also indicated they would like TAMAR to be more integrated into the community and help build unity. Although TAMAR focused heavily on community building in the

early years of establishing the research station in the area, these efforts have faded over time and staff has changed. It is important for conservation organizations to realize that community building is a process that evolves but never ends. This may be even more important in areas with tourism and second home development, where the constant flux in population diminishes local residents' sense of community and belonging. While reaching a larger number of people with the conservation message may meet short-term goals, this research begins to highlight the role norms of participation and social networks can play in conservation participation, which are important for long-term conservation objectives. Helping to create a sense of community through conservation presents a new, and more sustainable, outlook on participation that would benefit from further examination.

In conclusion, my research provides further evidence to support the need for a more comprehensive analysis of gender and conservation participation. Considerations of the gendered aspects of structure, culture and agency present useful information in understanding the barriers and motivations involved in conservation participation. This information can be used to tailor conservation programs that better meet the needs and interests of participants. While gender differences are not universal, a framework examining issues of structure, culture and agency allows differences related to age, class, ethnicity, religion, etc. to be considered as well. The conservation of endangered species, and indeed environmental protection in general, will require conscious and active participation by both men and women (Zelezny et al., 2000). Addressing gendered differences in conservation participation is one path toward this end goal.

REFERENCES

REFERENCES

Abd Mutalib, A. H., Fadzly, N., & Foo, R. (2013). Striking a balance between tradition and conservation: General perceptions and awareness level of local citizens regarding turtle conservation efforts based on age factors and gender. *Ocean & Coastal Management*. *78*(June), 53–63. doi:http://dx.doi.org/10.1016/j.ocecoaman.2013.03.015

Agarwal, B. (1997). Environmental Action, Gender Equity and Women's Participation. *Development and Change*. *28*(1), 1–44. doi:10.1111/1467-7660.00033

Agrawal, A., & Gibson, C. C. (Eds.). (2001). *Communities and the environment: ethnicity, gender, and the state in community-based conservation*. New Brunswick, N.J: Rutgers University Press.

Allendorf, T. D., & Allendorf, K. (2012). The Role of Gender in Park-People Relationships in Nepal. *Human Ecology*. *40*(5), 789–796. doi:10.1007/s10745-012-9510-7

Anthony, M. L., Knuth, B. A., & Lauber, T. B. (2004). Gender and citizen participation in wildlife management decision making. *Society and Natural Resources. 17*(5), 395–411.

Atkeson, L. R., & Rapoport, R. B. (2003). The More Things Change the More They Stay the Same: Examining Gender Differences in Political Attitude Expression, 1952–2000. *Public Opinion Quarterly*. *67*(4), 495–521.

Ballet, J., Sirven, N., & Requiers-Desjardins, M. (2007). Social capital and natural resource management a critical perspective. *The Journal of Environment & Development*. *16*(4), 355–374.

Belsky, J. M. (2003). Unmasking the "local": Gender, community, and the politics of community-based rural ecotourism in Belize. In S. R. Brechin (Ed.), *Contested nature: Promoting biodiversity conservation with social justice in the twenty-first century.* pp. 89–101. New: State University of New York Press.

Blocker, T. J., & Eckberg, D. L. (1989). Environmental Issues as Women's Issues: General Concerns and Local Hazards. *Social Science Quarterly*. *70*(3).

Buckingham-Hatfield, S. (2000). *Gender and environment*. London ; New York: Routledge.

Caiazza, A., & Gault, B. (2006). Acting from the heart: Values, social capital, and women's involvement in interfaith and environmental organizations. In B. L. O'Neill & E. Gidengil (Eds.), *Gender and Social Capital.* pp. 99–125. New York: Routledge.

Cleaver, F. (2000). Analysing gender roles in community natural resource management: Negotiation, lifecourses and social inclusion. *IDS Bulletin*. *31*(2), 60–67.

Cleaver, F. (2001). Institutions, agency and limitations of participatory approaches to development. In B. Cooke & U. Kothari (Eds.), *Participation: The new tyranny?* pp. 36–55. Zed Books.

Cornwall, A. (2003). Whose voices? Whose choices? Reflections on gender and participatory development. *World Development*. *31*(8), 1325–1342.

Cornwall, Andrea. (2004). Spaces for transformation? Reflections on issues of power and difference in participation in development. In S. Hickey & G. Mohan (Eds.), *Participation: From tyranny to transformation? Exploring new approaches to participation in development.* pp. 75–91. London and New York: Zed Books.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Los Angeles: SAGE Publications.

Cruz-Torres, M. L., & McElwee, P. D. (Eds.). (2012). *Gender and sustainability: lessons from Asia and Latin America*. Tucson: UAP.

Davis, D. L., & Nadel-Klein, J. (1992). Gender, culture, and the sea: Contemporary theoretical approaches. *Society & Natural Resources*. *5*(2), 135–147. doi:10.1080/08941929209380782

Dedoose Version 4.5, (2013). Web application for managing, analyzing, and presenting qualitative and mixed method research data (2013). Los Angeles, CA: SocioCultural Research Consultants, LLC (www.dedoose.com).

Denzin, N., & Lincoln, Y. (2005). *The SAGE Handbook of Qualitative Research.* Thousand Oaks California; SAGE Publications.

Di Ciommo, R. C., & Schiavetti, A. (2012). Women participation in the management of a Marine Protected Area in Brazil. *Ocean & Coastal Management*. *62*, 15–23. doi:10.1016/j.ocecoaman.2012.02.010

Dietz, T., Kalof, L., & Stern, P. C. (2002). Gender, Values, and Environmentalism. *Social Science Quarterly*. *83*(1), 353–364. doi:10.1111/1540-6237.00088

Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas, (Pró TAMAR). (2011). *Relatório de Atividades 2011*.

Hochstetler, K., & Keck, M. E. (2007). *Greening Brazil: environmental activism in state and society*. Durham: Duke University Press.

Instituto Brasileiro de Geografia e Estatística (IGBE). (n.d.). Retrieved from www.igbegovbrestadosat

Jackson, C. (1993). Doing what comes naturally? Women and environment in development. *World Development*. *21*(12), 1947–1963. doi:10.1016/0305-750X(93)90068-K

Jacobs, J. E. (2002). Community Participation, the Environment, and Democracy: Brazil in Comparative Perspective. *Latin American Politics and Society*. *44*(4), 59–88. doi:10.1111/j.1548-2456.2002.tb00223.x

King, B., & Peralvo, M. (2010). Coupling Community Heterogeneity and Perceptions of Conservation in Rural South Africa. *Human Ecology: An Interdisciplinary Journal*. *38*(2), 265–281. doi:10.1007/s10745-010-9319-1

Krishna, A., & Shrader, E. (1999). Social capital assessment tool. *Prepared for the Conference on Social Capital and Poverty Ban, June* 22–24.

Krueger, R.A., & Casey, M. A. (2000). *Focus groups: A practical guide for applied research.* Thousand Oaks, CA: Sage Publications.

Lowndes, V. (2006). It's not what you've got but what you do with it: Women, social capital, and political participation. In B. L. O'Neill & E. Gidengil (Eds.), *Gender and Social Capital.* pp. 213–240. New York: Routledge.

Marcovaldi, M., Patiri, V., & Thomé, JC, T. (2005). IBAMA: Twenty-five years protecting Brazilian sea turtles through a community-based conservation programme. *MAST. 3*(2) and *4*(1), 39–62.

Meinzen-Dick, R., & Zwarteveen, M. (2001). Gender dimensions of community resource management: The case of water user's associations in South Asia. In A. Agrawal & C. C. Gibson (Eds.), *Communities and the environment: Ethnicity, gender, and the state in community-based conservation.* pp. 63–88. Rutgers University Press.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: an expanded sourcebook* (2nd ed.). Thousand Oaks: Sage Publications.

Mohai, P. (1992). Men, women, and the environment: An examination of the gender gap in environmental concern and activism. *Society & Natural Resources*. *5*(1), 1–19. doi:10.1080/08941929209380772

Molyneux, M. (2002). Gender and the Silences of Social Capital: Lessons from Latin America. *Development and Change*. *33*(2), 167–188. doi:10.1111/1467-7660.00246

Montell, F. (1999). Focus group interviews: A new feminist method. *NWSA Journal. 11*(1), 44–71.

Morgan, D. L. (1988). *Focus groups as qualitative research*. Newbury Park, Calif: Sage Publications.

Norris, P., & Inglehart, R. (2006). Gendering social capital: Bowling in women's leagues? In B. L. O'Neill & E. Gidengil (Eds.), *Gender and Social Capital.* pp. 73–98. New York: Routledge.

O'Neill, B. L., & Gidengil, E. (Eds.). (2006). *Gender and social capital*. New York: Routledge.

Orga, M. (2008). Human-wildlife conflict and gender in protected area borderlands: A case study of costs, perceptions, and vulnerabilities from Uttarahand (Uttaranchal), India. *Geoforum. 39*, 14081–422.

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*. *24*, 1–24.

Rocheleau, D. E., Thomas-Slayter, B. P., & Wangari, E. (Eds.). (1996). *Feminist political ecology: global issues and local experiences*. London ; New York: Routledge.

Shields, M. D., Flora, C. B., Thomas-Slayter, B. P., & Buenavista, G. (1996). Developing and dismantling social capital: Gender and resource management in the Philippines. In D. E. Rocheleau, B. Thomas-Slayter, & E. Wangari (Eds.), *Feminist Political Ecology: Global Issues and Local Experiences.* pp. 156–179. London ; New York: Routledge.

Shiva, V. (1989). Women in nature. In *Staying Alive: Women, ecology and development.* pp. 38–54. London and New Jersey: Zed Books.

Silvey, R., & Elmhirst, R. (2003). Engendering Social Capital: Women Workers and Rural–Urban Networks in Indonesia's Crisis. *World Development*. *31*(5), 865–879. doi:10.1016/S0305-750X(03)00013-5

Stern, P. C., Dietz, T., & Kalof, L. (1993). Value Orientations, Gender, and Environmental Concern. *Environment and Behavior*. *25*(5), 322–348. doi:10.1177/0013916593255002

Stronza, A., & Pêgas, F. (2008). Ecotourism and conservation: Two cases from Brazil and Peru. *Human Dimensions of Wildlife*. *13*, 263–279.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: combining qualitative and quantitative approaches*. Thousand Oaks, Calif: Sage.

Tindall, D. B., Davies, S., & Mauboulés, C. (2003). Activism and Conservation Behavior in an Environmental Movement: The Contradictory Effects of Gender. *Society & Natural Resources*. *16*(10), 909–932. doi:10.1080/716100620

White Jr., T. H., Camacho, A. J., Bloom, T., Diéguez, P. L., & Sellares, R. (2011). Human perceptions regarding endangered species conservation: A case study of Saona Island, Dominican Republic. *Latin American Journal of Conservation*. *2*(1), 18–29.

Xiao, C., & McCright, A. M. (2012). Explaining Gender Differences in Concern about Environmental Problems in the United States. *Society & Natural Resources*. *25*(11), 1067–1084. doi:10.1080/08941920.2011.651191

Zelezny, L. C., Chua, P.P., & Aldrich, C. (2000). New Ways of Thinking about Environmentalism: Elaborating on Gender Differences in Environmentalism. *Journal of Social Issues*. *56*(3), 443–457. doi:10.1111/0022-4537.00177

CONCLUSION

The main objective of this research was to examine the role of gender and social capital in conservation participation and provide information to assist conservation managers in working with communities. More specifically, I was interested in how community characteristics and aspects of community social structure such as networks, norms, and trust (components of social capital) might influence conservation participation. Additionally, given that levels and types of political and conservation participation can differ among men and women, I wanted to further explore the role of access, attitudes and agency in gender differences in conservation participation. Collectively, my findings from these queries provide insight into the conceptualization of participation and how this can be used to inform participation in conservation specifically.

This study presents a novel approach to understanding the role of social capital in conservation participation and demonstrates the importance of non-conservation related participation to conservation. My main finding indicates that the general level of community participation and community norms of participation are just as instrumental as conservation attitudes in influencing participation in conservation. This means that as social capital increases and attitudes become more positively aligned with conservation, participation in sea turtle conservation should also increase. Conservation efforts rely heavily on programs that aim to change individual conservation attitudes in order to increase participation either formally or informally through behavior change. However, my findings suggest that efforts to engage with community organizations and increase

community capacity for participation may be just as beneficial for conservation participation. Individuals within communities and community organizations with higher levels of social capital are more likely to be open to supporting programs that benefit the collective (community). This could lead to greater conservation success, assuming that conservation managers are interested in engaging communities and both parties share the same goals.

Although aspects of social capital may point to increased conservation participation, gender analysis reveals differences in non-conservation and conservation participation among men and women related to issues of access, attitudes and agency. Gender differences in access to resources that enable participation (such as time, knowledge and skills), attitudes toward conservation and the act of participation itself, and the facilitation of access to opportunities through social networks all play a role. The gender-segregated nature of community organizations in the study area, coupled with women's lack of time and support, has contributed to the absence of women in sea turtle conservation. Conversely, increased access to opportunities and information makes men more likely to participate (past, present and future) in sea turtle conservation. While men's and women's attitudes toward sea turtle conservation were overall positive and did not differ significantly, attitudes toward participation did differ. Women indicated motivations for participation that revolved around improving the well-being of their families by learning new skills for increased income generation or similar enriching opportunities for their children. Motivations for participation among men involved leisure and recreation, as well as economic benefits. Despite these differences, it is important to acknowledge that opportunities for both men and women in the study

area were limited in general and access to such opportunities could be further diminished for members of the community of lower socio-economic status.

Additional findings from this research reveal the desire by community members for more integration of the sea turtle conservation project (TAMAR) in community life, including increased collaboration with community organizations. A recurrent theme throughout the responses in the questionnaires was for TAMAR to have a greater presence in the communities both physically and symbolically. Similar comments arose during the focus groups, in addition to calls for unity through greater participation and collaboration at the community level. Respondents also commented that TAMAR should play a role in helping to build unity within the community. Helping to create a sense of community through conservation presents a new, and more sustainable, outlook on participation that would benefit from further examination.

Overall this research addresses how, where, and why (or why not) people participate in their communities, and how this influences conservation participation. Changing attitudes toward conservation is not enough to encourage conservation participation. Understanding the motivations and barriers to participation at the community level can inform planning for conservation participation. Although this study only represents findings from four coastal communities, the overarching ideas could be broadly applied to conservation-related participation throughout the world. Further examination of social capital could benefit community engagement in conservation by providing a “road map” of community social structure in order to elucidate the cognitive and structural connections between conservation and non-conservation participation, lending to the creation of more long-term and meaningful engagement.