

Motivations for Community-based Conservation: A case from Odisha, India

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Abstract

Community-based conservation includes natural resource or biodiversity protection by, for and with the local community. However, surprisingly little is known about what enables community-based conservation. The aim of this research was to explore and identify potential motivations of a community-based organization in choosing, in this case, conservation of endangered olive ridley sea turtles (*Lepidochelys olivacea*) as their flagship project. Samudram Women's Federation, a State-level organization working with small-scale fishing communities in Odisha, India, was used as a case to explore questions around collective action for community-based conservation. Using qualitative methodologies, the study analyzed how the interactions and interests of multiple actors shaped the goals and activities for the conservation initiative. Government prohibition of killing turtles, or any other single factor, could not explain conservation behavior. Rather, many complementary factors (economic, political, environmental, social cultural and spiritual) enabled and/or motivated community conservation and environment stewardship.

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Acronyms and Glossary of Local Terms

Arribada: the synchronized, large-scale nesting of olive ridley sea turtles

ATREE: Ashoka Trust for Research in Ecology and the Environment

BPL: Below poverty line

CBC: Community-based conservation

CBD: Convention on Biological Diversity

CBNRM: Community-based natural resource management

CCRN: Community Conservation Research Network

CITES: Convention on International Trade in Endangered Species of Wild fauna and flora

CMFRI: Central Marine and Fisheries Research Institute, India

CMS: Convention on Conservation of Migratory Species

CPRs: Common pool resources

Dharnas: Organized protests or picketing

DoF: Directorate of Fisheries

EI: Equator Initiative

GMS: Gahirmatha Marine Sanctuary

GPS: Global Positioning System

INR: Indian Rupee (estimated 65 INR=1 USD)

MEA: Millennium Ecosystem Assessment

NGOs: Non-governmental Organizations

NLM: National Literacy Mission

NPs: National Parks

OMFRA: Orissa Marine Fisheries Regulation Act

OMRCC: Orissa Marine Resources Conservation Consortium

OTFWU: Orissa Traditional Fish workers' Union

PAs: Protected Areas

SES: Social-Ecological System

SEZ: Special Economic Zones

SHGs: Self-help Groups

TEDs: Turtle excluder devices

TEK: Traditional ecological knowledge

UAA: United Artists Association

UNDP: United Nations Development Program

USESA: United States Endangered Species Act

VMS: Vessel Monitoring System

WII: Wildlife Institute of India

WLPS: Wildlife Protection Act



Plate 1.1: *Arribadas* (mass nesting) of olive ridley sea turtles in Ganjam coast, Odisha



Plate 1.2: Fisher women carrying head loads of fish to be sold in the market

Chapter 1: Introduction

1.1 Introduction

Biodiversity conservation is a complex issue that requires the consideration of various factors and relationships. Conservation practitioners all around the world are looking for possible alternatives to the protectionist ideology of conventional conservation (Brooks *et al.*, 2012). In recent years, with the development of a neoliberal world economic system and the critical need for sustainable development, the issue of biodiversity conservation has become an important topic of discussion (Agrawal and Gibson, 1999; Agrawal and Gupta, 2005; Timmins and Juma, 2005; Agrawal, 2009).

During the past few decades there has been a shift in the approach of conservation from the traditional centralized one to a holistic, community-based participatory system. Research on community-based conservation (CBC) as one of the forms of resource management emerged in the late 1960s as an alternative to conventional top-down approaches (Berkes, 2004; Lejano *et al.*, 2006; Berkes, 2009; Berkes, 2013). Community-based conservation typically aims to combine various elements that connect conservation with development, by engaging local communities as active stakeholders and distributing the control over available natural resources (Brooks *et al.*, 2012). This idea of community-based conservation gained recognition when many conservation practitioners realized that the lack of attention to human rights, livelihoods and other social justice issues invites encroachment and poaching, which could lead to degradation and loss of resources and conflicts between different stakeholders involved in the resource utilization and/or management processes (Kaimowitz and Sheil, 2007; Berkes, 2013). Berkes (2013) underlines the importance of linking biodiversity conservation and livelihood benefits as this would enable local communities to mitigate both internal and external threats to natural resources and may actually

lead to resource expansion and enhancement. Community-based conservation tries to achieve the social, ecological and economic goals of conservation (Agrawal and Gibson, 1999; Haque *et al.*, 2009; Berkes, 2013).

The Millennium Ecosystem Assessment (MEA) identified some of the factors such as lack of recognition of social values, market values and non-market values as reasons why community-based conservation efforts fall short of the concept (Gruber, 2010). Non-market values are also known as externalities, which include the ability of local people to capture payments for environmental services received by others (also known as leakage) (Gruber, 2010). Creating sustainable livelihoods through direct cash incentives for conservation and also other indirect or in-kind incentives, such as social and political benefits, could help communities to attain conservation goals (Berkes, 2004; Cranford and Mourato, 2011).

How can one define a sustainable livelihood? The answer to this has evolved over time and is still evolving. Chambers and Conway (1992) define sustainable livelihood as:

“A livelihood that comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihood at the local and global levels and in the short and long term”

(Chambers and Conway. 1992: p6).

In their paper, Chambers and Conway (1992) identify capability, equity and sustainability as three main components of the concept of sustainable livelihood. They recognize that ensuring a sustainable livelihood is a prerequisite for a stable population and also for the sustainable

management of the resources (Chambers and Conway, 1992). In most cases, a community-based conservation project generates more attention to topics of social justice, equity and empowerment through matching local institutions and social structures with conservation goals, thus contributing towards ensuring a sustainable livelihood for the community (Berkes, 2004; Lejano *et al.*, 2006; Haque *et al.*, 2009).

The paucity of knowledge about the social-psychological mechanisms associated with community-resource management is another factor that makes community-based conservation more challenging (DeCaro and Stokes, 2008). That is one reason why understanding what sustains and motivates people to do community-based conservation becomes important (Barret *et al.*, 2001; Berkes, 2004). According to DeCaro and Stokes (2008) motivations or driving forces for conservation could be broadly classified as intrinsic and extrinsic (in some literature, they are referred to as autonomous and heteronomous). Intrinsic motivations include one's own actions, preferences, local beliefs and values, worldviews etc., while extrinsic factors involve a coercion or enticement to act such as incentives and payments for one's actions, external rules and regulations (DeCaro and Stokes, 2008). Thus various motivations contribute in building strong environmental stewardship within a community. Stewardship involves actions that could ensure long-term sustainability of resources and the associated livelihoods dependent on them (Kaimowitz and Sheil, 2007; Haque *et al.*, 2009). It is defined as set of planned management activities that would prevent exploitation, destruction or neglect of different resources (Timmer and Juma, 2005).

The United Nations Development Program (henceforth UNDP) has a rich database of case studies known as the Equator Initiative Program (henceforth EI) (UNDP, 2012) with the main goal to develop “lessons learnt” in resource management and sustainable livelihood generation by

recognizing community-based initiatives throughout the tropics (IDRC, 2004; Timmer and Juma, 2005; Berkes, 2013). Through the EI, many community-based management initiatives, which demonstrate opportunities for “*integration of partnerships, sustainability, transferability, leadership, community empowerment, gender equity, social inclusion and tangible benefits to biodiversity conservation and poverty reduction*” (IDRC 2002 as in Fernandes 2005, pg:5) are being recognized by the United Nations. I chose an award winning community conservation group, Samudram Women’s Federation (henceforth Samudram), from the state of Odisha (previously known as Orissa), India, associated with the protection of endangered olive ridley sea turtles and marine resource management (UNDP, 2012) to do this particular study. Recognizing their work in biodiversity conservation particularly in the conservation of olive ridley sea turtles and activities for poverty alleviation, Samudram was awarded the Equator Prize in the year 2010.

1.2 Purpose and Objectives

The purpose of the study was to identify the various motivations that lead to environmental conservation and stewardship. And also, I aimed to explore how motivations for conservation are linked to concerns about sustainability of the local economy and livelihood. The project was undertaken in cooperation with Community Conservation Research Network (henceforth CCRN) a network of scientists and diverse community, Aboriginal and governmental organizations from 18 countries around the world, hosted at Saint Mary’s University in Halifax (Nova Scotia, Canada) (CCRN 2015). The CCRN aims to build a knowledge network of “how place-based communities face their local environmental challenges” and identify any “local motivations” that influence designing policies (CCRN, 2012). They also focus on improving the understanding of and “best practices” for local level community involvement in environment conservation and stewardship and the support through government policies for these initiatives (CCRN, 2012). In this study, I

also tried to explore the relative importance of different motivations for conservation and environmental stewardship. Samudram was selected as the community-based initiative to investigate these questions.

The specific objectives of the study are:

- How does Samudram, a community-based conservation development initiative, function?
- What are the potential motivations for the conservation behavior and environmental stewardship?
- What lessons could be drawn from this community-based conservation development initiative?

1.3 Methods

The study approach falls primarily within the category of qualitative research. Creswell (2009) describes a qualitative approach to research as a tool to explore and understand different meanings individuals or communities ascribe to a social or human problem. Since I was trying to explore the process of interaction among the members of a community and try to investigate community members' personal, cultural and historical experiences helping them to form their actions towards conservation stewardship, it also shows characteristics of participatory, exploratory and constructivist worldview (Creswell, 2009). The research design applicable to this study was largely participatory as it attempts to pursue the objectives and questions from the community's point of view. In order to get a deeper understanding of the scenario, a case study approach was adopted as the research strategy.

The major source of data for this study was primary data collected in the field. In addition to this other secondary data sources like the statistical data from the ministry of environment and

forestry, UNDP and records of the federation itself was used. Data collection methods included participant observation and semi-structured interviews. In addition to these, focus group discussions were held to explore the community's perception of conservation as well as to validate the observations made from semi-structured interviews and participant observation.

1.4 Study Area

Odisha is one of the important maritime states of India. It extends from 17°49 N to 22°54 N latitude and from 81°29 E to 87°29 E longitude, on the Bay of Bengal coast of India (Fig 1.1). Formerly known as 'Orissa', Odisha has a 480 km long coastline bestowed with beautiful beaches, lakes and lagoons. Among all states in India, Odisha ranks 8th in marine fish production (Kumar & Shivani, 2014). The beaches in Odisha are largely sandy and are well known as "*Arribada*" beaches, where thousands of giant olive ridley sea turtles come every year to nest (Karnad *et al.*, 2009). There are three main mass nesting sites in the state; Gahirmatha National Park (GNP), Devi mouth and Rushikulya river mouth (Shanker *et al.*, 2003). However, there has been a decrease in the nesting populations of the olive ridley sea turtles in Odisha coast in recent years (Shanker *et al.*, 2003; Karnad *et al.*, 2009). The incidental capture of adult turtles in trawl-fishing nets and artificial illumination along the beaches due to developments, ports, aquaculture farms, chemical industries and missile ranges are posited as the two main causes for the decline in the number of turtles coming each year to Odisha (Pandav *et al.*, 1998). Even though the government has taken many steps through policies and use of turtle excluder devices (TEDs) on mechanized boats, the olive ridley turtle populations are still facing many challenges (Sridhar, 2005).



Fig 1.1: Map of India showing location of Odisha (Google Maps 2015)

Samudram Women's Federation (henceforth Samudram) is an organization that works for marine conservation mainly to protect these turtles and their nesting grounds at the community level in Odisha. This organization, which won the Equator Prize from the UN in 2010, is comprised of 160 Women's Self Help Groups (SHGs) across 50 villages on the southern coast of Odisha. Samudram is involved with the monitoring and protection of the olive ridley turtles that come to

breed every year to the Odisha coast. Their activities include habitat restoration, artificial reef construction and promoting sustainable fishing practices to improve marine resource diversity. The members of Samudram Federation are economically marginalized and come from a background with very low, or in most cases no primary education (UNDP, 2012). These women were subjected to various socio-economic vulnerabilities, due to bans and restrictions by the government on fishing and also due to frequent cyclones (Sridhar, 2005). Samudram also functions as a “People’s Bank” and gives them a sense of empowerment which helps these artisanal fishers with their socio-economic development (Sridhar, 2005). Thus members of this organization and their families not only conserve and protect the turtle habitats at the community level but also benefit through their conservation activities on a livelihood level through capacity-building training, access to microfinance and increased income as a result of higher fish yields (UNDP, 2012).

In an interview Chittamma, the woman leader of Samudram states,

“the insecurities of women’s lives (in Odisha) are compounded by the dangers involved in fishing itself. When fishermen lose their lives at sea, there is no way of procuring any benefits for the family. The women of these families bear the brunt of the tragedy. In fact, losses are beyond that of the loss of life. The greater tragedy really is the lack of recognition of fisher folk. Having no formally recognized identity makes availing of life insurance and other benefit claims problematic.” (Sridhar, 2005, p: 34).

It was important to learn why these economically marginalized women, who consider themselves victims of government sponsored turtle conservation policies, take up conservation in the first place. Considering the dynamics and complexity of the power sharing within the community, a better understanding of the various institutions and their interactions within themselves and the

community was important to understand their different motivations for conservation and stewardship.

1.5 Theoretical Background

Commons theory is the appropriate background for this study because it addresses questions of institutions and collective action. Enabling community-based conservation requires organization and a set of rules in use. Samudram is the institution that provides organization and has over the years coordinated activities of fishers, other fish workers, women's groups and conservation practitioners. Community-based conservation in the study area is an example of collective action, that is, when a group of individuals create an institution for the benefit of all, rather than of individuals. They may, within a community, create a governance system in which they are also involved "*over time in making and adapting rules within collective-choice arenas*" in terms of various resource utilization and management decisions (Varughese and Ostrom 2001, p 748).

Commons literature identifies "*exclusion*" and "*subtractability*" as two major characteristics of common pool resources (Feeny *et al.*, 1996; Ostrom *et al.*, 1999; Berkes, 2006). Controlling access to resources (*excludability problem*) and formulating rules and regulations to control the user impact on resources (*subtractability problem*) are two approaches. But they are also the major causes of tension between resource users and conventional management authorities (Feeny *et al.*, 1996; Ostrom *et al.*, 1999; Berkes, 2006). Rather than top-down controls, community incentives for management, through the creation of local property rights to generate sustainable livelihoods for communities, are important for the management of the commons (Berkes, 2004).

Community-based conservation is one of the strategies for ensuring this (Agrawal and Gibson, 1999; Berkes, 2003; Agrawal and Gupta, 2005; Ostrom *et al.*, 2009). Recent decades showed an increasing trend of involving local communities in decision-making processes and management of natural resources (Feeny *et al.*, 1990; Agrawal and Gibson, 1999; Ostrom *et al.*, 1999; Berkes, 2003; Agrawal and Gupta, 2005; Campbell *et al.*, 2007; Agrawal, 2009). Community-based natural resource management (CBNRM) involves decentralized decision making based on the grounds that decision makers, closer to the ground have a greater interest in the sustainable use of resources, better access to information, lower organizational costs and greater willingness to participate than external players (Agrawal and Gupta, 2005; Seixas and Davy, 2005). Agrawal and Gibson (1999), identify the different community characteristics that determine conservation actions, such as heterogeneity in size and composition and resource dependence. They further discuss how interactions and interests between multiple actors in community-based conservation such as community, NGOs, government and other different institutions, play an active role in designing the various rules and norms for actions and ultimately influence the emerging interests and actions within the local community (Agrawal and Gibson, 1999).

1.6 Significance of the study

The purpose of the study was to look into the various motivations that lead to environmental conservation and stewardship and also to explore how motivations for conservation are closely linked to concerns about sustainability of the local economy and livelihood. Considering the fact that there were multiple motivational factors within the community in participating in resource management activities at the community scale, it was interesting to identify the dynamics of various stakeholders and their reasons to manage resources sustainably.

Firstly, this study provided insights into the community's perceptions about conservation and what motivates them to do it (or not to do it). Secondly, the study explored the "lessons learnt", which could be used to develop capacity building, knowledge generation and policy strengthening in similar community-based conservation initiatives around the world – or to initiate such initiatives. Thirdly, this study will allow comparing whether or how the motivations and capabilities of stewardship transcend any single natural resource, or vary across resource sectors.



Plate 2.1: Participants of a focus group discussion in Gokurkhudam



Plate 2.2: Monthly meeting of Samudram Members in Nolianuagaon

Chapter 2

Research Methodology and Study Area

2.1 Philosophical Worldview

The principles of both constructivist and transformative worldviews guided me through this research. Creswell (2009) states that a social constructivist tries to understand the world in which they live and work by developing subjective meaning to their experiences (Creswell, 2009). As I mentioned in chapter 1, one of the objectives of my research was to identify the potential motivations for conservation and environment stewardship within the community. The primary objective here was to rely mostly on the participants' view of the situation being studied and thus understand the process of interaction among different individuals, which is associated with the constructivist worldview (Creswell, 2009). My research might also be considered to fall under the realms of participatory or now known as transformative worldview as I came across various issues associated with marginalized community such as empowerment and equality. Transformative worldview also guided me to prepare a template to understand the context in detail and to do my research by focusing on the needs of the individuals or groups within the community (Creswell, 2014).

2.2. Research Design

Methodology of the research was closely related to the research purpose and objectives. The main aim of this study was to understand the various motivations that lead to environmental conservation and stewardship and also to explore how motivations for conservation are closely linked to concerns about sustainability of the local economy and livelihood. Therefore, as a first step, it was required to understand the working and activities of the Samudram, which provided me with insights into the potential motivations behind their environmental stewardship. Finally,

identify any policy lessons that could be drawn from the Samudram and their community-based conservation activities, which could be useful elsewhere.

The subjective nature of the research objectives made qualitative research as the most appropriate form of research in this study. Creswell (2009) identifies qualitative research as “a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (p. 4). It is an excellent way to understand a particular context-specific scenario as it is neutralistic (Golafshani, 2003) and it is about experiences, understandings, opinions and feelings of the individuals of the study, giving the researcher a holistic perspective (Groenewald, 2004). According to Woods (2006), the five major features of qualitative research are: a) focus on natural settings, b) interest in meanings, c) perspectives and understandings, d) emphasis on process, and e) concerns related to inductive analysis and grounded theory.

For research purposes, a village was chosen considering certain criteria such as willingness of local community members to cooperate with the study, proximity to the turtle nesting sites, livelihood, extent of conservation activities and also information provided by the federation and the NGO officials themselves. Participants for the study were selected mostly through snowball sampling, as it is considered as one of the informal and easy methods to reach the target population (Atkinson and Flint, 2001). The sample group consisted of members and non-members of the federation, traditional fish workers and leaders of the NGO.

2.3 Research Strategy

Since the objectives of the study are highly subjective, the research strategy adopted for this study was the case study approach. Creswell (2014) defines case study as: “a strategy of inquiry in which the researcher explores in depth a program, event, activity, process or one or more

individuals. Cases bounded by time and activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period of time” (p. 13). According to another researcher, Yin (2009), a case study research method is an empirical inquiry that explores contemporary phenomena within a real-life context. Various other researchers have also defined the case study concept in different ways (Yin, 2009), but one common factor that remains the same is that the case study approach enables the researcher to have a rich understanding of the processes within a given context and its ability to generate answers to questions such as “why?” “what?” and “how?” (Gummesson, 1991; Yin, 2009).

There are strengths and weaknesses associated with using the case study approach as a research strategy. Gerring (2004) recognizes that the findings through the case study approach are difficult to be generalized. Some other scientists also question the reliability, validity and the ability of case study strategy of inquiry to give cause-effect conclusions (Stuart *et al.*, 2002; Beverland and Lindgreen, 2010). But it has to be understood that the case study approach helps the researcher to emphasize detailed contextual analysis of various events and obtain a rich understanding of complex issues (Soy, 1997).

2.4 Study Area

Samudram is spread over 16 villages in Odisha and has more than 1600 members (UNDP 2012). Taking into consideration the time constraints and resources, four communities were selected in which to conduct research upon my arrival at Ganjam, which became my home for the next five and a half months (Fig 2.1). Selection criteria were determined on several factors such as:

- Willingness of local community members to cooperate with the study.

- Extent of conservation activities within the community.
- Based on the information from the federation and the NGO personnel themselves, regarding conservation, livelihood and available social-wellbeing data.



Fig 2.1: Map of Ganjam coast and Rushikulya river mouth showing the four study sites. (Google Earth, 2015)

2.5 Data Sources

The major sources of data for this study were primary information, collected through participant observation, semi-structured interviews and focus group discussions. But secondary data sources from the NGO, Samudram and documents from the Ministry of Environment and Forestry, such as annual reports, numbers and names of registered members in the federation, statistics on turtle status, records of conservation and livelihood activities etc. were also used.

2.6 Data Collection Methods

Data collection methods used for this study were: a) participant observation, b) semi-structured interviews and c) focus groups. Findings from participant observations were supported by the semi-structured interviews.

2.6.1. Participant Observation

Participant observation is an integral part of most of the qualitative research as it allows the researcher to obtain better insights into the context, relationships and behavior of the area, community or phenomenon being studied (Mack *et al.*, 2005). It is not only a data collection method, but also a process by which crucial information might be unveiled to the researcher, which could be helpful for research design, data collection and interpretation. Participant observation enables the researcher to be “personally involved” with the research participants by entering their world and being a part of it. Bernard (2006) enlists five advantages for including participant observation as a data collection method.

- a) An extensive variety of data can be collected
- b) Reduces the problem of reactivity
- c) Helps the researcher to understand the cultural activity deeply
- d) Equips the researcher with more appropriate questions
- e) In certain contexts, participant observation could be the only successful data collection method, where all other methods may fail (Bernard, 2006).

Participant observation has both advantages and disadvantages. It helps the researcher to blend in with the natural activity and provides a first-hand experience thus improving the understanding

(Woods, 2006). Woods (2006) also identifies some challenges associated with the use of participant observation, conflicts arising between the roles of a researcher and participant being one among them. The possibility of producing biased results due to the personal bias in the observations and also by the information provided by the informants could also be a challenge (Kawulich, 2005). Creswell (2014) identifies another challenge faced by many researchers using participant observation, which he calls “going native”, where the researcher tends to take the role of the participant is often possible. Another weakness associated with this method is that it is highly time consuming (Mack *et al.*, 2005). However, participant observation is an excellent method to understand phenomena and helps to direct the research based on real life experiences.

2.6.2 Semi-Structured Interviews

Interviews included semi-structured interviews (Hancock, 2002), and focus groups. During a semi-structured interview, the interviewer controls the topic of the interview but the scope of the interview is still determined by the participant. Semi-structured interviews are usually informal, allowing the interviewees to feel comfortable so that they will talk freely (Woods, 2006). Semi-structured interviews ask the researcher to be self-critical and open, to be a good listener and a good observer. They generally contains open-ended questions framed by the researcher based on his/her observation or experiences (Hancock, 2002). Table 2.1 shows the number of interviews I conducted in this study. The semi-structured interview guide is given in Appendix C. All interviewees except two UAA staff and one community member were women.

Table 2.1: Interview distribution and composition within the study areas/villages

Number of Interviews	Details
Semi-Structured Interviews - 47	15 – Nolianuagaon Village 9 – Gokurkhudam Village 11 – Podampetta Village 12 – Arjyapalli Village
Key Informant Interviews - 12	5 – Samudram Members 3 – Samudram Administration 2 – UAA staff 2 – Community Members

2.6.3 Focus Groups

The main purpose of conducting focus group discussions is to gain knowledge on a particular topic or phenomenon by interviewing or discussing it with groups of people who are directly affected by it (Creswell, 2014). Focus group discussions equip the researcher with key information by exploring the range of opinions associated with the topic. They enable the researcher to understand what factors influence the actions or opinions of the community and the participants (Hancock, 2002), and provide in-depth information regarding real life situations and also to identify further research interests (Hancock, 2002). Usually each focus group consists of 6 to 10 participants. In organizing a focus group, the diversity of the participants is ensuring their comfort in expressing their views and opinions, are taken into consideration (Hancock, 2002; Creswell, 2014). Focus group discussions are often considered as providing an excellent opportunity to validate data collected through various other qualitative and quantitative data collection methods (Creswell, 2014). In my study, focus groups were used to validate the data collected through participant observation and semi-structured interviews. In total I conducted five

focus group discussions; two in Nolianuagaon Village and one each in Podampetta, Gokurkhudam and Arjyapalli villages. Table 2.2 shows the composition of the five focus group discussions we convened in the various villages.

Table 2.2: Composition of focus groups

Focus Group	Location	Participant details
1	Nolianuagaon Village	6 in Total – All members of Samudram
2	Nolianuagaon Village	7 in Total – 6 Samudram Members and 1 Family member
3	Podampetta Village	5 in Total – All members of Samudram
4	Gokurkhudam Village	5 in Total – All members of Samudram
5	Arjyapalli Village	6 in Total – 5 Samudram members and 1 Family member.

2.7 Data Analysis

Primary data collected through participant observation and semi-structured interviews were documented immediately in the field on a daily basis. Analysis of data collected through these methods was accomplished in the field by coding them according to themes based on similarities and/or dissimilarities existing between the observations. Coding was done manually and on a spreadsheet. The data identified through participant observation formed the framework for the semi-structured interviews. I started transcribing the interviews while I was in the field with the help of my translator. Both data collected through participant observation and data from semi-structured interviews were analyzed during the fieldwork. This was helpful in narrowing down the

themes that were used to run the focus groups. These data were then used to carry out any further discussions or clarifications that were possible while in the field. Further detailed analysis of the data was conducted after leaving the field.

Responses from semi-structured interviews and key informant interviews (Total n = 59) were sorted into five clusters of factors: economic, environmental, political, social and cultural. This was done for analytical purposes, realizing that there is some overlap among these clusters, and the informants themselves probably do not see sharp distinctions among the five clusters of factors.

2.8 Validity and Reliability of the Study

Validity in a research project reflects how closely the research results actually meet with the real situation (Golafshani, 2003; Cohen and Crabtree, 2008). The quality of research design in case studies has been improving over the time, thus enhancing the validity and reliability of studies (Beverland & Lindgreen, 2010). Generally, the validity of the research is determined by asking a series of questions (Joppe, 2000) and then identifying common themes from the answers one gets. The reliability of a study will be ensured by the proper documentation of the methods and findings, so that the study and findings could be repeated in similar settings (Cohen and Crabtree, 2008). I adopted following strategies to ensure validity and reliability of this research:

- Triangulation of data that were collected from multiple sources and through different data collection methods.
- Used three different data collection methods to mitigate any bias of data from any one approach

- Draft findings were shared with the respondents and participants as part of member checking.
- Sample size and sampling methods were chosen in the field to ensure representativeness from the community.

2.9 Limitations of the Study

One of the major limitations that influenced this research was the time constraint of only 3-4 months of fieldwork. This time period was just enough for me to create a working relationship with the community at a comfortable level, as I did not have any prior personal connections with the Samudram federation. A secondary limitation would be potential errors and bias due to the sampling technique. Since this study was conducted through a case study approach, the generalizability of the data and findings is also another limitation.

2.10 Ethics Review

All research under the aegis of the University of Manitoba involving human subjects has to gain approval by the Joint Research Ethics Board under the protocol # J2014:039 (Appendix A).



Plate 3.1: Olive ridley turtles mating in a mating patch



Plate 3.2: Olive ridley turtle hatchlings

Chapter 3: Literature Review

3.1 The Commons

Resources that are commonly owned or shared by a group of people or a community are called commons or common pool resources (CPRs) (Feeny *et al.*, 1990; Ostrom *et al.*, 1999). Management of these CPRs has often become a challenging ordeal for our social, economic and environmental well-being (Feeny *et al.*, 1990; Ostrom *et al.*, 1999; Dietz *et al.*, 2003). Garret Hardin (1968) in his influential article “The Tragedy of the Commons” argues how one user’s demands on a resource keeps on increasing until the anticipated benefits of his or her actions equals the costs, because every individual ignores the cost imposed on others by them and ultimately this will result in the overuse and degradation of the resources (Hardin, 1968). He made this argument based on factors such as: overpopulation, carrying capacity and over exploitation. He explained this scenario of “Tragedy of Commons” through his classic example of the over-grazing of a village’s common pastureland bringing benefits to individual, but ultimately causing the degradation of the grasslands, to the detriment of the community (Hardin, 1968). His solution to this problem was either to privatize these resources or to impose strong government regulations to enforce lower grazing pressure (Hardin, 1968).

The two most important characteristics of a CPR are: a) excludability; and b) subtractability (Ostrom *et al.*, 1999). Excludability means there is a control of access to resources by the potential users (Feeny *et al.*, 1990; Ostrom *et al.*, 1999; Berkes *et al.*, 2001; Dietz *et al.*, 2003; Berkes, 2009; Nayak, 2011). This excludability property of CPRs is problematic in managing resources such as water bodies, offshore fisheries, wildlife, atmosphere, radio frequency bands etc. The subtractability problem, which means actions or use of resources by each user, decreases the benefits for other users (Feeny *et al.*, 1990; Ostrom *et al.*, 1999; Berkes *et al.*, 2001;

Dietz *et al.*, 2003; Berkes, 2009). In other words, extent of exploitation by a user limits the ability of other users to exploit or use the CPRs. This characteristic comes into play mostly in the management of static resources like forestry, rangelands, grasslands, small water bodies etc. Due to these two main characteristics Berkes *et al.* define CPRs as a “class of resources for which exclusion is difficult and joint use involves subtractability” (Berkes *et al.*, 1989, p. 91).

CPRs generally have four categories of property rights within the regime: a) open access, b) private property, c) communal property and b) state or government property (Feeny *et al.*, 1990). The absence of enforced property rights is the main characteristic of the open access property regime (Ostrom *et al.*, 1999). Resources could be accessed by anyone and there are no regulations (Berkes, 2009). Private property regime gives an individual or a group of individuals the right to own and regulate the resources (Ostrom *et al.*, 1999). They also have the right to exclude others from using those resources. In a communal property regime, the rights to use and manage the resources are in the hands of a specific community comprising different individuals (Berkes, 2009). In most cases, the rights are exclusive but transferable within the community (Feeny *et al.*, 1990). Individual members of the community have equal access to the resources; in most cases these resources are managed by cooperatives (Berkes, 2009). Finally, in the state property regime, resource rights are exclusively vested in the hands of the state or the government (Feeny *et al.*, 1990; Berkes, 2009) and they can either regulate or subsidize use of those resources (Ostrom *et al.*, 1999).

Since Hardin’s (1968) article about the “Tragedy of the Commons”, various scientists have made contributions to this area of the literature. Hess (2008) identified a “new commons” which is dynamic and evolving. He categorizes these “new commons” into cultural, medical/health, neighborhood, knowledge, market and global commons (Hess, 2008). Basurto and Ostrom (2009),

identify the importance of “understanding the general theory” pertaining to the casual processes and to learn how to point out the key variables present or absent in the particular context so as to “understand the success and failures” (Basurto and Ostrom, 2009, p. 257).

3.2 Community-based Conservation

Forestry, wildlife, marine resources and many other CPRs face the subtractability and excludability problems. Community-based resource management or conservation is one of the ways to avoid Hardin’s “tragedy of commons” (Berkes *et al.*, 2001). Community-based conservation (CBC) has evolved as a new approach to Natural Resource Management, in which local communities participate in decision-making processes, through the bottom-up planning process. CBC typically aims to combine elements that would connect conservation with development, by engaging local communities as active stakeholders and distributing the control over various available natural resources (Brooks *et al.*, 2012). Thus community-based conservation lays the path to a paradigm shift in conservation from enforcement to incentive. In most community-based conservation initiatives, the whole authority is developed at the local level, consisting of three major agents in general: community, local governing bodies and administering agencies (Baral, 2012).

The idea of CBC gained recognition when many conservation practitioners realized the fact that lack of attention to human rights and livelihoods invites encroachment and poaching, which can lead to degradation of resources and conflicts between stakeholders (Berkes, 2013). Although widespread and widely employed, CBC faces some criticisms too. The social complexities of a community are not always understood completely by those from outside and they are often idealized as harmonious units, when in fact they may experience internal power inequities and conflicts (Waylen *et al.*, 2010; Brooks *et al.*, 2013). In some cases, decentralization initiatives face

dead ends as centralized governments become reluctant to cede their powers to the local stakeholders. Another important argument by critics of CBC is the market-based approach that sometimes accompanies community-based conservation (Taylor, 2009; Brooks *et al.*, 2013). Critics believe that commercialization is incompatible with conservation goals and also anticipate sharp trade-offs between conservation and economic development (Berkes, 2004; Brooks *et al.*, 2012; Brooks *et al.*, 2013).

Agrawal and Gibson (1999), discuss in detail the dynamic nature of communities and the importance of understanding this. They identify three main factors that determine success or failure of conservation efforts at the local scale: different actors with diverse interests that constitute the community; the process or actions through which these different actors interact; and various institutional arrangements present which make way for these interactions (Agrawal and Gibson, 1999). Understanding these three factors are important, as communities are heterogeneous in size, composition and interests and their interactions with various institutional arrangements influence decision-making and developing rules and norms that would directly or indirectly affect various resource management outcomes (Agrawal and Gibson, 1999).

3.3 Incentives for conservation

There has been a conceptual shift in ecosystem-based management in the past few decades; the idea of managing regional landscapes changed to maintaining the ecological integrity of the protected area that they contain (Muchapondwa *et al.*, 2012). According to Muchapondwa *et al.* (2012), biodiversity conservation could be considered as an economic issue for two main reasons: biodiversity should be considered as a component of natural capital, if we consider various ecosystem services as such, as well as other valuable ecosystem goods and services like water flow, soil nutrient cycling, ground water replenishment, medicinal plants and other recreational

activities; all contribute as sources of (economic) well-being. The other reason is in most of the cases biodiversity conservation outside protected area is generally guided by the norms and values of the market economies they are associated with and they often promote the goals of economic optimization (Muchapondwa *et al.*, 2012).

A potentially effective mechanism for mainstreaming biodiversity conservation might thus be promoting the idea of incentives for conservation (Agrawal and Gibson, 1999; Berkes, 2006; Haque *et al.*, 2009; Berkes, 2013). But there are a few things one must remember here. Biodiversity is not a fixed asset that every one experiences in the same way. It is experienced contextually and is socially constructed (Rodriguez *et al.*, 2006). Hence, there are evident differences in the way that society identifies and values biodiversity and various ecosystem services (Pascual and Perrings, 2007). Another fact is that, while considering incentives for biodiversity conservation in purely economic terms, one must also keep in mind the reality that a societies or communities are highly complex and elusive systems, making the whole benefit distribution process equally complex and elusive. Apart from this, in most community-based conservation initiatives, there is often a mismatch between what conservationists think of as benefits and what the stakeholders in a community might consider as benefits (Berkes, 2004). The United Nations in their World Charter of Nature (1982), makes its stand clearly by stating that: “Nature shall be respected”, “the population levels of all life forms, wild and domesticated, must be sufficient for their survival”, and “ecosystems and organisms shall be managed to achieve and maintain optimum sustainable productivity, but in such a way as not to endanger the integrity of those other ecosystems or species with which they coexist” (Robinson, 2011, p. 958).

Incentive measures for biodiversity conservation are something that developed in recent decades. The main aim in providing an economic incentive for biodiversity conservation is to

influence the community's behavior by making it more desirable for them to conserve their resources rather than degrading or depleting biodiversity through their economic activities (Emerton, 2000 as in Ngoc, 2010). This is made possible through two methods: Payments for Ecosystem Services (PES) and engaging in Conservation Agreements (CAs) with multiple stakeholders in community-based conservation scenarios (Niesten *et al.*, 2010; Cranford and Mourato, 2011). Studies done on various Equator Initiative cases have shown this shift in the multidimensional aspect of incentives for conservation (Berkes, 2013). These incentives are broadly classified as economic, environmental, political, social and cultural (Shukla and Gardner, 2006; Fernandes, 2005; Haque *et al.*, 2009; Berkes, 2013). Thus they aim to create opportunities for direct incentives not only through economic development, but also through indirect incentives such as empowerment and social development (Table 3.1)

Table 3.1: Incentives for biodiversity conservation (Source: Berkes, 2013)

Classes of incentives	Different forms
Economic	Cash compensation, monetary supports in the form of funds and credits, employment opportunities, livelihood diversification, access to markets.
Environmental	Ensuring sustainability of resources, improving biological productivity, habitat and species conservation
Political	Empowerment, participation in decision making processes
Social	Better social, educational and health services
Cultural and Spiritual	Enriching traditional values, strengthening cultural identity, protecting historical and heritage resources.

3.4 Bridging the Knowledge Gap

Conflicts between the practitioners, scientists and communities occur quite frequently in designing management policies. Traditional Knowledge is a term with a very broad definition; it is holistic and spiritualistic in nature, promoting development through mutual respect for other forms of life and ecosystems inhabited by different living communities in a sustainable way (Demunshi and Chugh, 2010). It encompasses the knowledge, practices and beliefs developed across generations by being associated with both individuals and groups (Teixeira *et al.*, 2013). It may be codified as well as orally transmitted information. By the term “traditional”, one must not assume that this kind of knowledge is old or ancient, but that it is based on various traditions and knowledge that are created, practiced and transmitted through generations. It adapts to the changes in the surrounding environment and never stops developing (Finetti, 2011).

Indigenous knowledge, another term used hand in hand with Traditional Knowledge, is a generic term denoting the knowledge systems of Indigenous peoples or communities (Berkes 2004). The foremost roles of traditional and Indigenous knowledge in environmental planning, land use management and cropping patterns of an area are being increasingly recognized by governments, development agencies and non-governmental organizations (Cetinkaya *et al.*, 2012; Teixeira *et al.*, 2013). Incorporating Traditional Knowledge in the decision-making processes also increases participation of the local stakeholders that are expected to be affected by the new regulations for accessing natural resources, maximizing credibility and minimizing criticisms from the several stakeholder groups (Silver and Campbell, 2005).

If we consider the traditional knowledge systems and western science, we can identify a number of similarities and dissimilarities. Both are generated through the same intellectual process of creating order out of disorder (Berkes, 1993). But even then, Traditional Knowledge usage in

decision-making is frequently challenged and often dismissed by biological scientists and western natural resource managers (Silver and Campbell, 2005). Hence it is recommended that traditional knowledge derived data is often coupled with some level of scientific validation before it can be put into practice. The major differences between traditional and scientific knowledge systems can be summarized as in the Table 3.2. However, some conservationists suggest that there are some close similarities between western science and traditional knowledge (Agarwal, 1995).

Table 3.2: Differences between traditional knowledge and western science (Source: Berkes, 1993)

Traditional knowledge	Scientific knowledge
· Mainly qualitative	· Mainly quantitative
· It has an intuitive component	· It is purely rational
· It is holistic	· It is mostly reductionistic, except in very few fields
· Mind and matter are considered together	· Mind and matter are considered separately
· Traditional Knowledge is moral and spiritual	· Scientific Knowledge is value free and mechanistic.
· It is based on empirical observations and accumulation of facts by trial and error methods	· It is based on experiments and systematic deliberate accumulation of fact
· Mostly diachronic data – collected over a long period in a smaller area	· Mostly synchronic data – collected over a short time period in a larger area

During the past decades, local communities have become the centerpiece of the new environmental governance paradigm. Research focused on participatory approaches towards conservation are very important as they provide insights into way of empowering communities

(Berkes, 2004; Christoph, 2010). Incorporation of Traditional Knowledge in decision-making and participatory governance in natural resource management is a trend that is being seen all around the world. Various projects and initiatives around the world, involving local communities, designing an organizational and institutional structure bring in local and traditional knowledge in ecosystem management as this is found to be more successful than with conventional approaches (Pisupati and Subramanian, 2010). It is also important to note that using different knowledge systems in conservation efforts would definitely create a feedback loop at different scales, and cross-scale institutional dynamics, necessary to complement western conservation ideologies and pursuing a path towards adaptive co-management (Pisupati and Subramanian, 2010).

3.5 Conservation, Fisheries and Marine Resources Management: An Indian perspective

After its Independence from Britain in 1947, India embarked on a program of planned economic development called the Five Year Plans launched in 1951. Since then the emphasis of the policy makers has been on poverty reduction and tackling problems of unemployment. The various governments have been depending on these two factors to design and implement their economic policies. However, the resulting euphoria of rapid economic development created pressure on the country's natural resources (Singh, 2002). Environmental degradation in India was attributed to a variety of social, economic, institutional and technological factors such as over population, urbanization, industrialization and increasing use of pesticides and fossil fuels etc. India, a country with 2.4 percent of the world's total surface area, supports and sustains 17 percent of the world's population. It was not until the 1970s that the government realized the need for environmental protection as an integral part of its development strategy (Shankar et al. 2003).

India's marine and coastal resource systems were traditionally characterized by a continuum of 'common pool resources' encompassing shores, seas, lagoons and lakes. Governance

of coastal areas in a developing country like India requires an efficient balance between conservation objectives and social equity with the imperative of economic development. Various top down approaches have been imposed by the federal and provincial governments since the 1960's such as limits of mechanized fish boats during different seasons, mesh-size regulations, zoning of fishing areas based on fishing vessels, and land use regulations along the coastal areas. These actions, instead of fostering a sustainable management opportunities contributed towards the disintegration of the traditional commons that extended from the shorelines to the ocean.

Marine and coastal resource protection in India was first initiated in 1967 by the declaration of Point Calimere in Tamil Nadu, a wetland habitat for waterfowl and other migratory birds, as a wildlife sanctuary (Singh, 2002). In 1972, India passed the Wild Life (Protection) Act (WLPA) which laid the framework for protection of wild animals, birds and plants by establishing two main forms of protection. The first was designating a series of protected areas (PAs), variously classified into National Parks (NPs), Wildlife Sanctuaries, Conservation Reserves and Community Reserves. The main aim of this form of conservation was to protect and develop wildlife and their habitats, including landscapes and seascapes, and protecting traditional and cultural conservation values and practices that already existed. The second was listing various species under different schedules of the WLPA; by doing so these species were protected from hunting. Even though the WLPA is legislated by the Central government, it is implemented by the Chief Wildlife Warden of the various State Forest and Wildlife Departments (Rajagopalan, 2009)

3.6 Odisha: Turtle Conservation

Odisha, located on the Bay of Bengal coast of India, lies between 17°48' and 22°34' north latitude and 81°24' and 87°29' east longitude and is well known for its rich wealth of natural resources. Due to its proximity to the equator, it has a tropical climate with the moderating

influence of the ocean. The state is drained by a number of rivers such as the Mahanadi, the Rushikulya, the Subarnarekha and the Brahmini. The Chilika lagoon, the largest lagoon in India and a famous Ramsar site for conservation is in Odisha. The geography and climate of Odisha make it a biodiversity hotspot, with a wide variety of flora and fauna (Nayak, 2011). It is also famous for many indigenous varieties of rice, which are still being cultivated, and is also the seat of the famous Central Rice Research Institute of India (CRRI, Cuttack). Paradip is the major seaport in Odisha and divides the 480-km coastline into northern and southern coasts. The northern part of the Odisha coast is characterized by the delta system formed from the heavy sediments brought by the rivers Mahanadi and Brahmini and is home to a complex ecosystem consisting of mangrove forests, marshes and estuaries. The southern coast of Odisha, on the other hand, is famous for its open shores and sandy beaches (Sridhar, 2005).

The olive ridley turtle populations are widely distributed across the globe and their mass-nesting phenomenon called "*Arribadas*" has been recorded from the Pacific coast of Mexico (in La Escobilla) and Costa Rica (in Ostional and Nanute). But the largest breeding population of these turtles is found on the Odisha coast of India (Sridhar, 2005). Every year it is estimated that around 500,000 to 800,000 turtles visit Odisha for nesting (WII, 2009). These endangered turtles were facing threats due to mortality caused by incidental catches by shrimp trawler operations and also drowning due to gill-nets and trawl nets (Sridhar, 2005). The conservation measures got a boost after the WTO Shrimp-Turtle case of 1996 (Sridhar, 2005). In 1996, the United States (US) banned all shrimp imports from Odisha, India applying the section 609 of US Public Law 101-102, which restricted all US companies from importing shrimps harvested with technologies not certified to have a regulatory or conservation program similar to that of the US. The US Endangered Species Act of 1973 requires all US shrimp trawlers to be equipped with Turtle-

excluder devices (TEDs), which forced shrimp exporting countries like India to make TEDs mandatory on their shrimp trawlers as well (Sridhar, 2005; WII, 2009).

The endangered olive ridley turtles were included in Schedule I of the Indian Wildlife (Protection) Act of 1972 (Sridhar, 2005) India is also a signatory to the Convention on International Trade in Endangered Species of wild fauna and flora (CITES, 1973) and also the Bonn convention of 1979 on the conservation of migratory species of wild animals (CMS) (Mazoomdar, 2013). These international agreements also forced the country to design new strategies for turtle conservation. Following these actions at the federal and international regulations, the state of Odisha passed various laws to “protect” these turtles by imposing restrictions and bans on fishing. Some of these are summarized in Appendix D.

But these laws have been affecting the artisanal fishing communities of the Odisha coast who were already economically marginalized. Women, who have always been the invisible power behind the domestic front including agriculture and fisheries, were the section of the society who have been mostly affected (UNDP, 2013). Previous studies done on the Odisha coast make it clear that the conservation practices in place in these areas do not consider the interests of the traditional fishers, whose sustenance is directly linked to their marine resources (Sridhar, 2005; Mazoomdar, 2013). Figure 3.1 shows the map of Odisha with state sponsored fishing regulations that are in place during the turtle breeding season, i.e. from November to May. Hence fisheries management should be considered as an integral part of the tools being used to design turtle conservation strategies in Odisha.

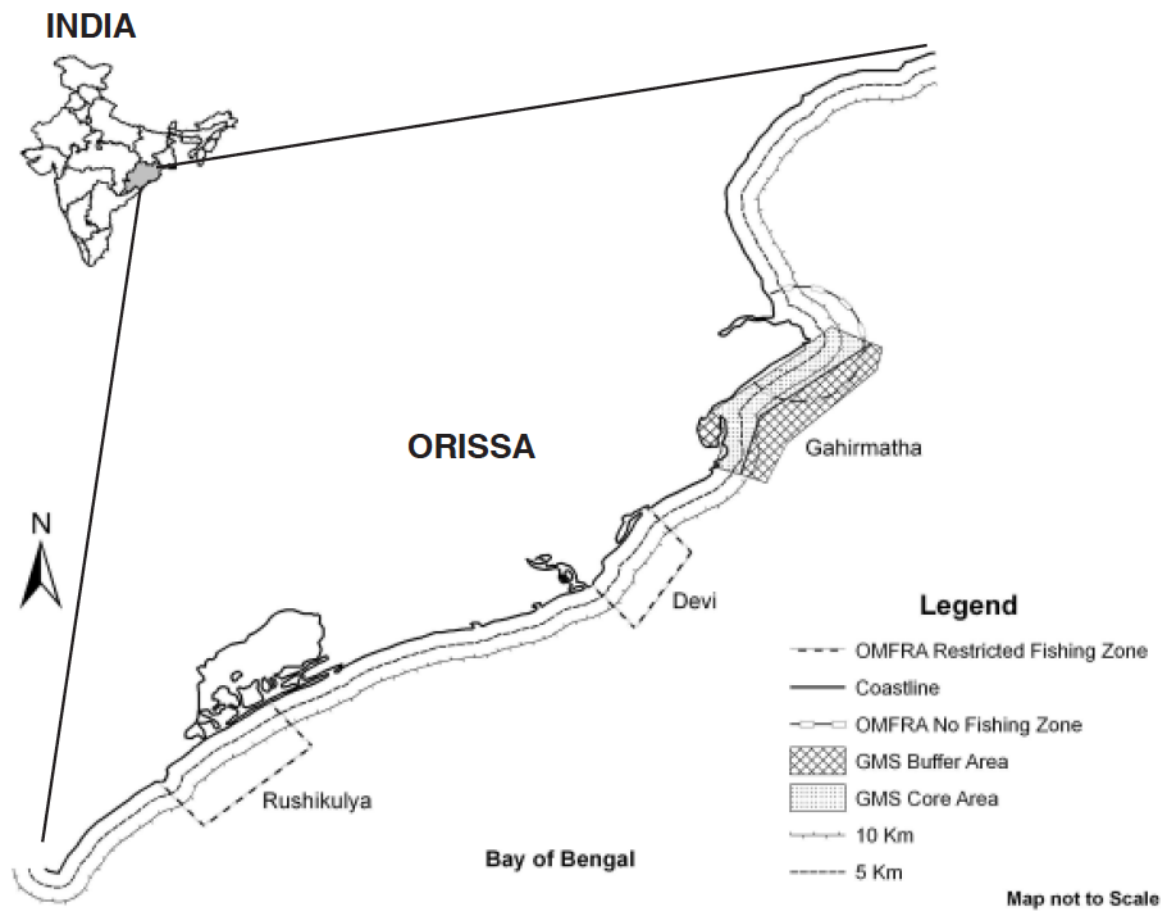


Fig 3.1: Map of Odisha showing state sponsored fisheries regulations for Turtle conservation in place (IOTN, 2005)



Plate 4.1: Fisherman with traditional fishing vessels



Plate 4.2: Fishermen repairing their nets

Chapter 4

Samudram Women's Federation

4.1 Introduction

This chapter discusses objective one, how does Samudram, a community-based conservation development initiative, function? The chapter deals with Samudram's organizational structure, activities and networks. The data in this chapter were collected through participant observation and key informant interviews with Samudram members and members of their local partners.

4.2 A Social-Ecological Systems view of the Study Site

Odisha alone has 813 fishing villages along its coast, which is about 24.7% of the total number of fishing villages in India (Kumar & Shivani, 2014). The population in this region is mainly composed of marginalized fishers and aquaculture farmers belonging to various Hindu castes and sub castes (Nayak and Berkes, 2010). People from the Telugu speaking nolia caste dominate the fishing operations in all these four communities. Nolias have been fishing for more than 1000 years and references to this "fishing caste" can be found in the Tamil Sangham Literatures, which is more than 1500 years old (Kalavathy, 9999). Over 50% of these maritime fisher families live Below Poverty Line (BPL) and less than 55% have any formal education (India Census, 2011).

The basic social-ecological system in this study includes Samudram Women's Federation (Samudram), small-scale fishers, the fishery, and olive ridley turtles. The study area includes four communities, Nolianuagaon, Podampetta, Arjyapalli and Gokurkhudam, in Ganjam district, in which Samudram is active. The four communities have a total population of about 5,600 in 1,200 households. The study area is a sample of the total turtle nesting area, which stretches over 482

km of mostly sandy and low-lying coastline and supports some 114 communities, with a total population of 85,000. Over 97% of the people living in these four communities are identified as followers of Hinduism and less than 2% of other religions of which Islam is the most widespread (India Census 2011).

More than 90% of the population living in these four communities identify themselves as artisanal fishers and they don't use mechanized boats for fishing. Here the term "mechanized boats" might need some clarification. According to the fishers, a mechanized boat is a vessel which is fitted with pulley and other mechanical parts that are used for fishing as in trawlers or in large scale gill net operations. As per Odisha directorate of fisheries data, 89% of the fishing vessels operated in Odisha are non-mechanized (ODF, 2014).

Women play a crucial role in the small-scale fishing scenario in Odisha. According to the data from the Directorate of Fisheries under the government of Odisha, 81.8% of people involved in the marketing of fish are women. Women also comprise a majority of the human capital involved in curing and processing (88.1%) and collection of fish seed (57.4%) in Odisha (DOF, 2015). Table 4.1 summarizes the demographics and fishing patterns of the four study sites.

Small-scale fishing communities are among the most vulnerable sections in Odisha. The problems of the fishers especially the traditional fishers are many, including declining fish catches, lack of market facilities, lack of value addition knowledge and skills, and lack of low-cost credit. They are poor, marginalized and exploited by people from so-called "upper castes" who provide credit and charge high interest rates, typically close to 100% per annum (Nayak and Berkes 2010). The small-scale fishing communities are not well enough organized to raise their voices against exploitation and demand their genuine rights from the government. Conflicts between trawlers and

traditional fishing folks are also quite common, as trawlers, who are supposed to fish in deep-sea, move closer to the shore for fishing, and take away the catch of traditional fishers.

Table 4.1: Caste groups, boats and gear used in the fishing villages studied

Name of the Village	No of Households	Important Castes	Types of Boats used	Types of nets used
Nolianuagaon	425	Nolia – Jalaris & Vodabalijas	Non-motorized plank boats, Motorized plank boats & Mechanized gillnetters.	Gillnets, Drift nets and Liners.
Podampetta	250	Nolia – Jalaris & Vodabalijas	Non-motorized plank boats, Motorized plank boats & Mechanized gillnetters.	Gillnets, Drift nets and Liners.
Arjyapalli	400	Nolia – Jalaris & Vodabalijas	Non-motorized plank boats, Motorized plank boats, Trawlers & Mechanized gillnetters.	Gillnets, Drift nets and Liners.
Gokurkhudam	125	Nolia (Jalaris & Vodabalijas), Gokhas & Kaibartas	Non-motorized plank boats	Castnets, Driftnets, beach seining and Trammel nets

Even though the Orissa Marine Fisheries Regulation Act (OMFRA) guarantees exclusive fishing rights in inshore waters to traditional fishers, incidents of encroachments by trawlers are common and often end in violent conflicts. In addition to this, government imposed fishing bans

during the months of February, March and April, in the name of olive ridley turtle conservation and frequent cyclones during the monsoon months (September to November) also limit the earning days of these fishing communities.

Hence during the past two decades, even though the artisan fishermen have worked hard, their numbers increased, their investments and crafts increased, and they produced more, but they earned less income and became poorer due to the exploitative system, thus pushing them into a never ending cycle of indebtedness and poverty.

4.3. Samudram Women's Federation

Samudram evolved in the year 1993 in response to these challenges. The seed was sown by a group of 13 women who, under the leadership of Mrs. Chitamma, formed Kali Amma Nari Shakthi Sangh as a micro financing initiative to lessen the dependence on illegal moneylenders. This women's self help group came to the notice of United Artists' Association (UAA), a non-profit organization started in 1965 and already spearheading many initiatives in community development through social enterprises, sustainable agriculture, education, emergency relief and rehabilitation during cyclones and other natural disasters. UAA was selected by the government of Odisha and UNICEF to improve the water and sanitation in Ganjam district. UAA joined hands with the Nari Shakthi Sangh (NSS) under Mrs. Chitamma's leadership to fight a greater array of problems that the fishing communities were facing, such as broken public distribution systems, inadequate drinking water, healthcare and education facilities, illegal money lenders and middle men in the fish trade and illicit liquor trade. The NSS met with government officials and persevered in their demands and the government intervened in stopping the liquor trade in fishing villages.

Samudram's growth can be credited to its joint focus on biodiversity conservation and community enterprise. The initial success as a small women's group encouraged those women to pursue their dreams of income generation and social enterprise. Thus in 1995, with the help of UAA, Samudram was registered as a State Level Women's federation of 15 traditional women fish worker's Self Help Groups (SHGs). Since then Samudram has grown into a federation with more than 350 SHGs and spread over 52 fishing villages along 4 coastal districts (Ganjam, Puri, Jagatsinghpur and Balasore) of Odisha, partnering with many organizations. Table 4.2 lists the networks and partners that Samudram has created in the past two decades.

Table 4.2: Networks and Partners of Samudram

Financial	Capacity Building	Organizational	Outreach
<ul style="list-style-type: none"> •Action Aid •Oxfam International •J.D. Trust •Orissa Marine Resources Conservation Consortium (OMRCC) •Government Programs •Ford Foundation 	<ul style="list-style-type: none"> •Orissa Marine Resources Conservation Consortium (OMRCC) •South Indian Fishermen's Federation (SIFFS) •National Fish Worker's Forum (NFF) •Central Marine and Fisheries Research Institute (CMFRI) •Orissa University of Agriculture Technology (OUAT) •Central Institute of Fisheries Education (CIFE) •Aharam Traditional Crops Co. Ltd 	<ul style="list-style-type: none"> •United Artists' Association (UAA) •Orissa Traditional Fish Workers' Union (OTFWU) •Orissa Marine Resources Conservation Consortium (OMRCC) 	<ul style="list-style-type: none"> •Youth Organizations •Village Development Committee •Nari Seva Sangh (NSS)

4.4 Organization of Samudram

Samudram has effectively used the principles of cooperation enshrined in the International Cooperative Alliance. Membership is voluntary and open to all women (but only in the coastal districts, since this is a fishing federation). The administrative structure is purely democratic and

members contribute equitably and democratically control the capital of the cooperative. They maintain their cooperative autonomy in the operations with external organizations. Every member of Samudram is first enrolled in a community level women's self-help group (SHGs) and these constitute the General Body of this state level federation. Each SHG consists of 10 to 12 members and about 10 SHGs constitute the village level federation called the Nari Seva Sanghs (NSSs). Representatives from the village level federation represent their SHGs and NSSs at the district level committee. A group of SHG mobilizers, trade volunteers and others connects each grass root level Samudram member to the mainstream activity of the Federation. Every five years, the Samudram general body elects an executive committee, comprising 11 Samudram members and 4 special invitees or experienced people from research institutes, marketing, and processing facilities. This executive committee elects the president of Samudram democratically. Figure 4.1 shows the organizational structure of Samudram.

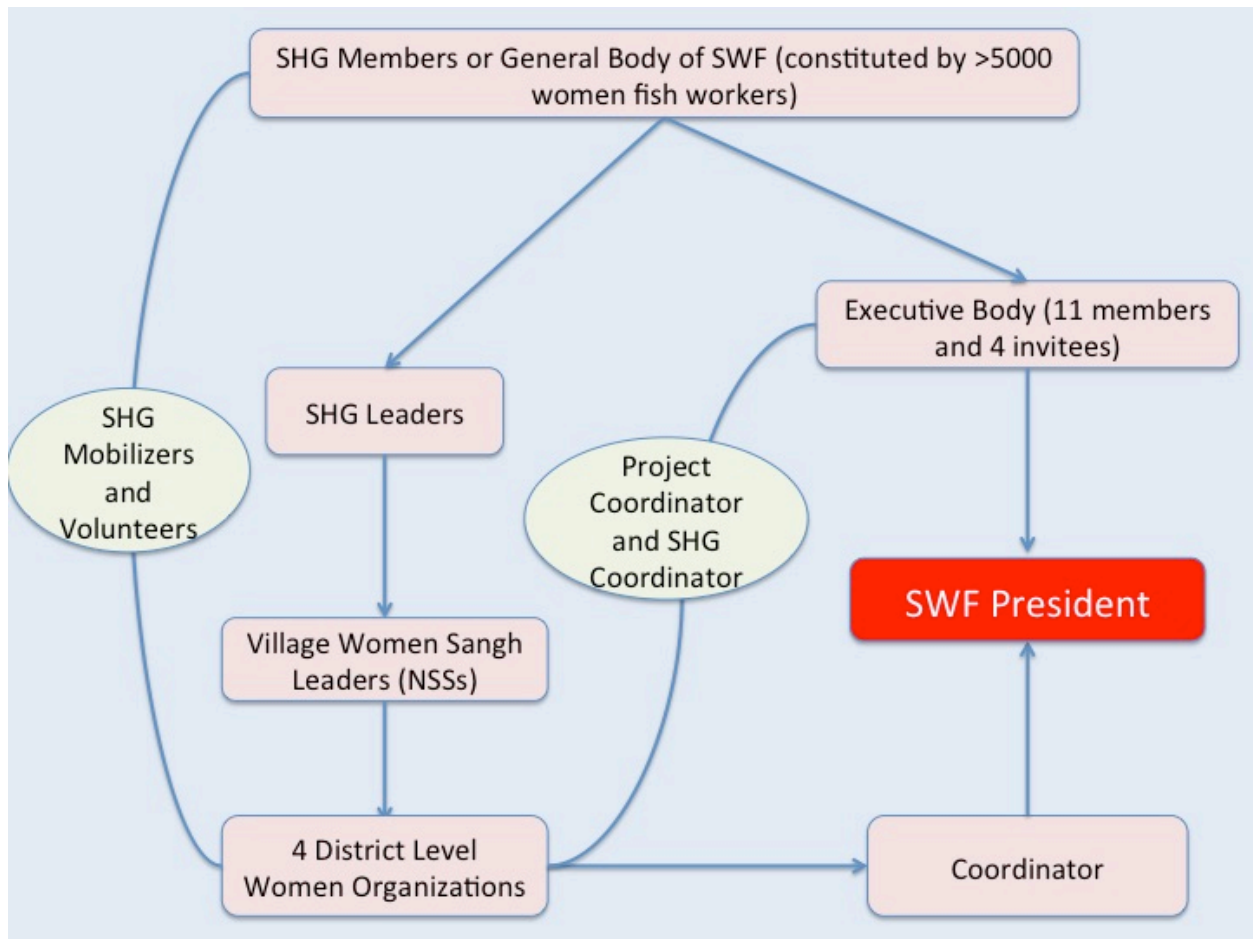


Fig 4.1: Organizational structure of Samudram (original figure)

4.5. Samudram Activities

Samudram has managed to bring together not only the women of the fishing villages but also the fishermen, thanks to a free and fair standardized process. The federation also works with indebted boat owners under contract with traders, crewmembers and families associated with dry fish processing. By creating savings and credit mechanisms for all stakeholders, Samudram has enabled effective linkages with banks for the community. This has enabled the community to purchase nets and other equipment for sustaining their livelihoods. Further, the federation has created visibility of the growing business enterprise with effective market linkages in different

states in India and now potentially in markets abroad. Figure 4.2 summarizes the different activities Samudram takes part in the communities.



Fig 4.2: Activities of Samudram

Samudram's activities primarily focused on promoting the conservation of marine resources, particularly the endangered olive ridley turtles. The federation promoted sustainable fishing practices and marine life friendly tools and gear for fishing. They also played an important role in linking economically marginalized fishing communities to better markets and exporters. This ensured better prices for the fishing community and lessened the role of middlemen in fish trade and exports.

Samudram also initiated a community-based standardized procurement process, with better storage and processing facilities which guaranteed that the fish reach the markets outside Odisha in good quality and safely. Samudram was pivotal in developing diversified sources of income for the fishing families, which made them more sustainable. They were successful in developing additional income generation during fishing bans or restriction periods through beach patrols during the olive ridley nesting months, developing and selling value added and processed marine products such as dry fish, pickles, papads etc.

In order to save the fishing communities from illegal moneylenders, Samudram undertook what they call a “Financial Literacy” program through which they connected fishing families to mainstream banking and credit systems. They were also successful in advocating for fish workers’ rights and successful in helping communities to take advantage of the government programs and subsidies available to them. Figure 4.3 shows various Samudram partners that are involved in supporting them in different activities.

In a community plagued with many social evils such as illicit liquor trade, child marriage, lack of education and infrastructure, Samudram spearheaded many community-building initiatives. They successfully lobbied the government to take action against the illicit liquor trade in the region. The federation also focused on gender empowerment through capacity building, training, knowledge dissemination, youth outreach programs and networking. Samudram members were encouraged to send their children to school, especially their girls, as often girls were denied opportunities for education. Thus Samudram invested in communities’ social development through building schools, health and infrastructural support to local fishers and their families.

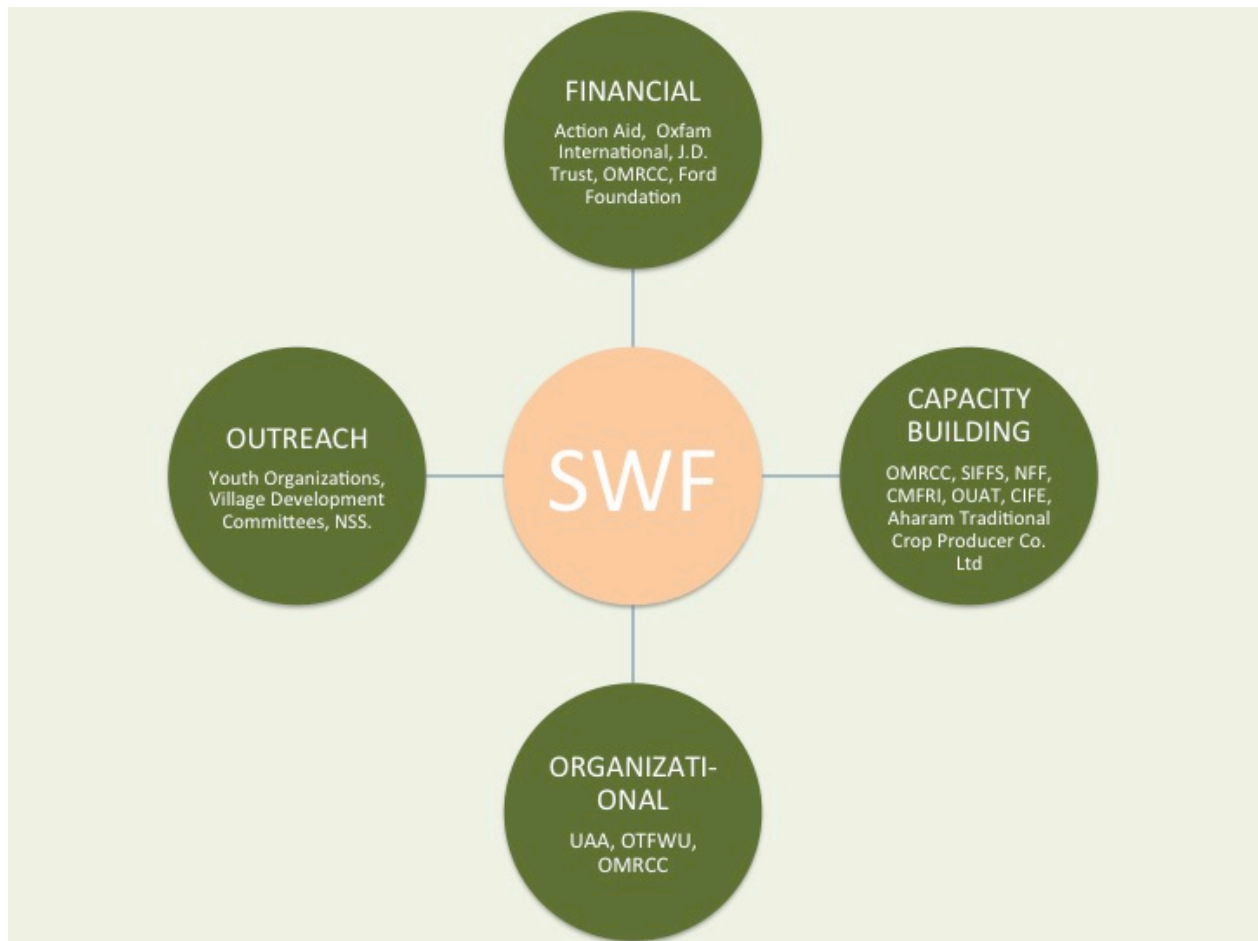


Fig 4.3: Partners of Samudram

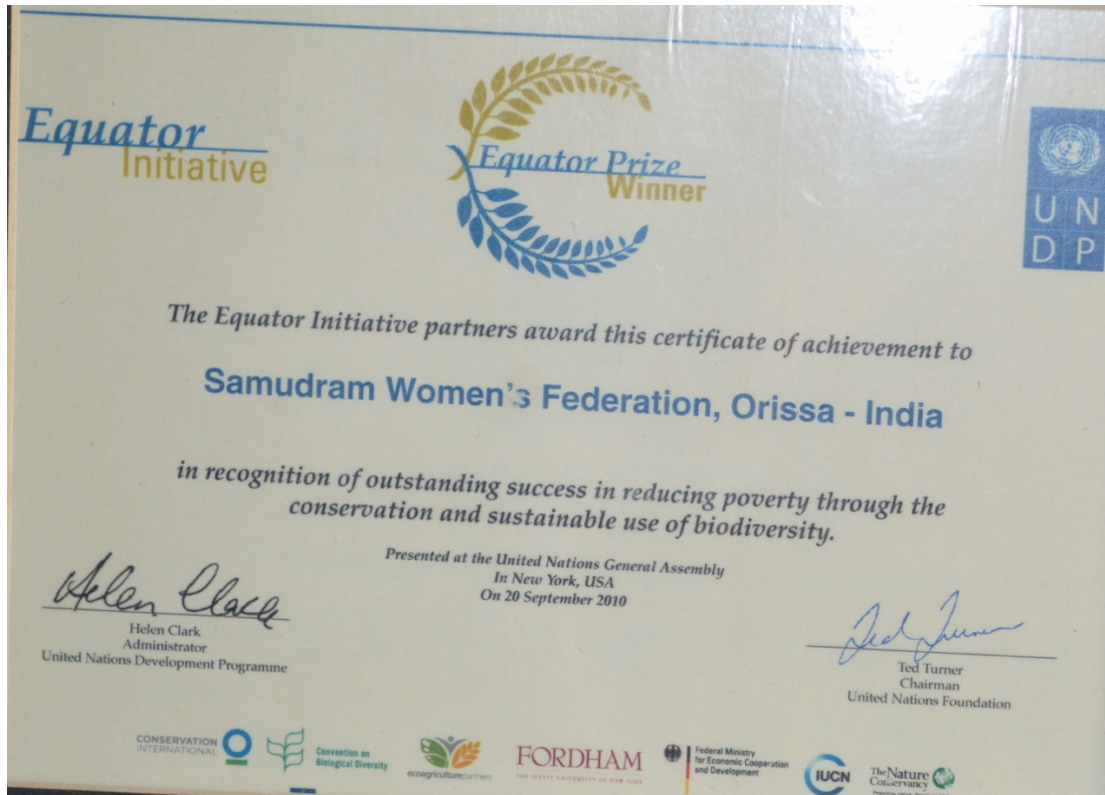


Plate 5.1: UNDP Equator Prize won by Samudram Women's Federation



Plate 5.2: Beach Cleaning Initiative organized by Samudram with a local school

Chapter 5

What motivates Samudram to carry out community conservation?

5.1 Introduction

This chapter discusses the second objective of my research, to answer the question, what are the potential motivations for the conservation behavior and environmental stewardship of Samudram members? The chapter identifies the various relevant factors, some of which may be interlinked, play important roles in motivating a community to be part of a conservation-development initiative like Samudram. The data for this chapter come from participant observation, semi-structured interviews and focus group discussions.

5.2 Motivation for Conservation

The data for the research was collected through participant observation and also through conducting 47 semi-structured interviews, including 12 key-informant interviews with Samudram members, administration teams, UAA members, and community members. I also conducted 5 focus group discussions two in Nolianuagaon and one each in Podampetta, Gokurkhudam and Arjyapalli. Each focus group had 5 to 7 members participating. All the participants were Samudram members and/or their family members who have been involved in Samudram activities. The main question I was asking the community during my field research in Odisha was: What are the potential motivations for conservation and stewardship in this community-based resource management initiative? This formed the key theme of discussions during my interviews and focus group meetings. The key question of the focus group discussions was, “Why become a member of Samudram and participate in their activities?” The interviews and focus group discussions allowed the community to paint a vivid picture of various interlinked and complementary factors that motivated them to be resource managers by being part of Samudram.

Even though government prohibition of fishing activities during nesting season and penalties for killing the olive ridley turtles were in place, just the enforcement factor alone could not explain the conservation behavior of the community. Through my research, I was able to identify a mix of various intrinsic and extrinsic motivational factors along with the legal restrictions that played an important role in encouraging the community to take conservation of marine resources as their flagship project. These factors could be broadly categorized as: economic, environmental, social/political and cultural.

Table 5.1 Interview responses for Motivations for Community-based Conservation in case of Samudram

Motivations for Community-based Conservation	Samudram Leaders (n=7)	Samudram Members (n=25)	Non-Member s (n=10)	NGO reps (n=5)
Economic Factors				
Cash Incentive through conservation jobs (beach patrols)	5	18	4	5
Income diversification	7	21	3	5
Elimination of middle men in fish procurement process	7	22	6	3
Direct linkage to wholesale fish markets	6	22	6	3
Value Addition of Marine Products	7	24	4	5
Mainstream banking facilities	6	16	7	5
Micro financing and access to mainstream credit systems	7	21	2	5
Environmental Factors				
World view – Sea as their “mother” and ocean beings as “brothers and sisters”	5	21	6	2
Health of the ocean	7	25	8	4
Biodiversity conservation	7	19	6	2

Opportunity to “give back” to “Mother Ocean”	6	21	4	1
Political Factors				
Bringing women in mainstream society	7	22	8	5
Awareness about their rights	5	17	4	5
Lobbying for policy changes	7	17	7	5
Advocating for rights of small-scale fishers	4	16	7	5
Social Factors				
Establishment of schools	6	21	8	5
Support for studies for children from small-scale fishing families	5	21	2	4
Access to better health facilities	6	19	7	5
Adult literacy campaign	7	16	6	5
Cultural Factors				
Turtles as an avatar of Lord Vishnu	7	25	10	4
Beliefs associated with Turtles – “World resting on the back of a turtle”	3	7	2	2

The members of Samudram have a holistic view about conservation and marine resource management. According to them,

“Conservation is multidimensional and holistic, encompassing species, humans, environment and whole biosphere”.

5.3 Economic Factors

Samudram was successful in bringing women together and in pooling their own resources in the form of savings and leveraging external capital. The project benefits more than 6,000 fisherwomen and their families. Samudram coordinates many income diversification activities such as job creation involving relatively small incomes from beach patrolling, training in duck,

poultry and goat farming, crab fattening, and rice processing during the time of fishing restrictions. In addition to this, there were indirect benefits through Samudram's capacity building and "financial literacy programs," by linking the fishing community to mainstream banking and credit system, micro financing, distribution of low-cost fishing equipment and infrastructure, direct linkage to wholesale fish markets, training in value-addition, and marine product diversification.

Alternate Livelihood Strategies: Income diversification forms the central pillar for Samudram's sustainable livelihood strategies. Samudram along with its partners OMRCC and ATREE formed beach patrol groups to work along with (not always) government conservation guards to monitor and protect these endangered olive ridley turtles during peak nesting periods. Since these periods coincide with the fishing restriction, beach patrol offers additional income. In 2014 each member of the beach patrol group was paid INR 150 (~US \$3) per night. In addition to this, there were indirect benefits through Samudram's training in animal husbandry. Members are given both technical and financial support in duck, poultry and goat farming. They were also encouraged to diversify their income, especially during the fishing bans and in periods of restrictions, through crab fattening, seaweed production (for agar industry), and rice processing. Loans were made available to women to establish skill based small businesses like tailoring, handicrafts etc. Samudram helps various government and aid agencies (Water Aid, USAID, Ford Foundation) in research, surveying and distribution of relief during cyclones. All these helped in diversifying, enabling the members to establish sustainable income sources and also generate supplementary income.

5.3.1 Procurement, packaging and marketing of Marine Products

Before Samudram came into picture, the fishers were at the mercy of the local traders who through their agents (intermediaries) took advantage of the poor fish workers who weren't

organized and many who did not have any education. They fixed the prices and forced the fishers to accept those prices as they monopolized the trade of fish. To add to the misery, these local traders also were the “illegal money lenders” used to lend money to fishing families at exorbitant rates (sometimes even at 90% interest... from an interview) and hence most of the fishing families were indebted to these intermediaries and had little choice but to sell their catch to them at very low prices. And in most cases, payments were made to the fishers in irregular installments. For these families who relied entirely on these payments for their day-to-day sustenance, this resulted in them being chronically indebted to these “money lenders” and ultimately falling in to their vicious debt trap. The fishing communities lacked proper market linkages and in many cases had to make distress sales to the local traders. There was little bargaining power left with the community. Leaders of Samudram understood that market intervention and fair prices for the fish products are critical for the development of fishing communities in the region. Samudram evolved in response to this situation by initiating a community based standardized process of procurement. They built nine fish procurement and processing centers equipped with freezers and other storage equipment run by local women. They also encouraged fishers to store their fish in iceboxes to ensure longer shelf life for their products, and, as well, connected them directly to the wholesale markets in cities such as Kolkata, Vizag, Chennai, Mumbai and Delhi.

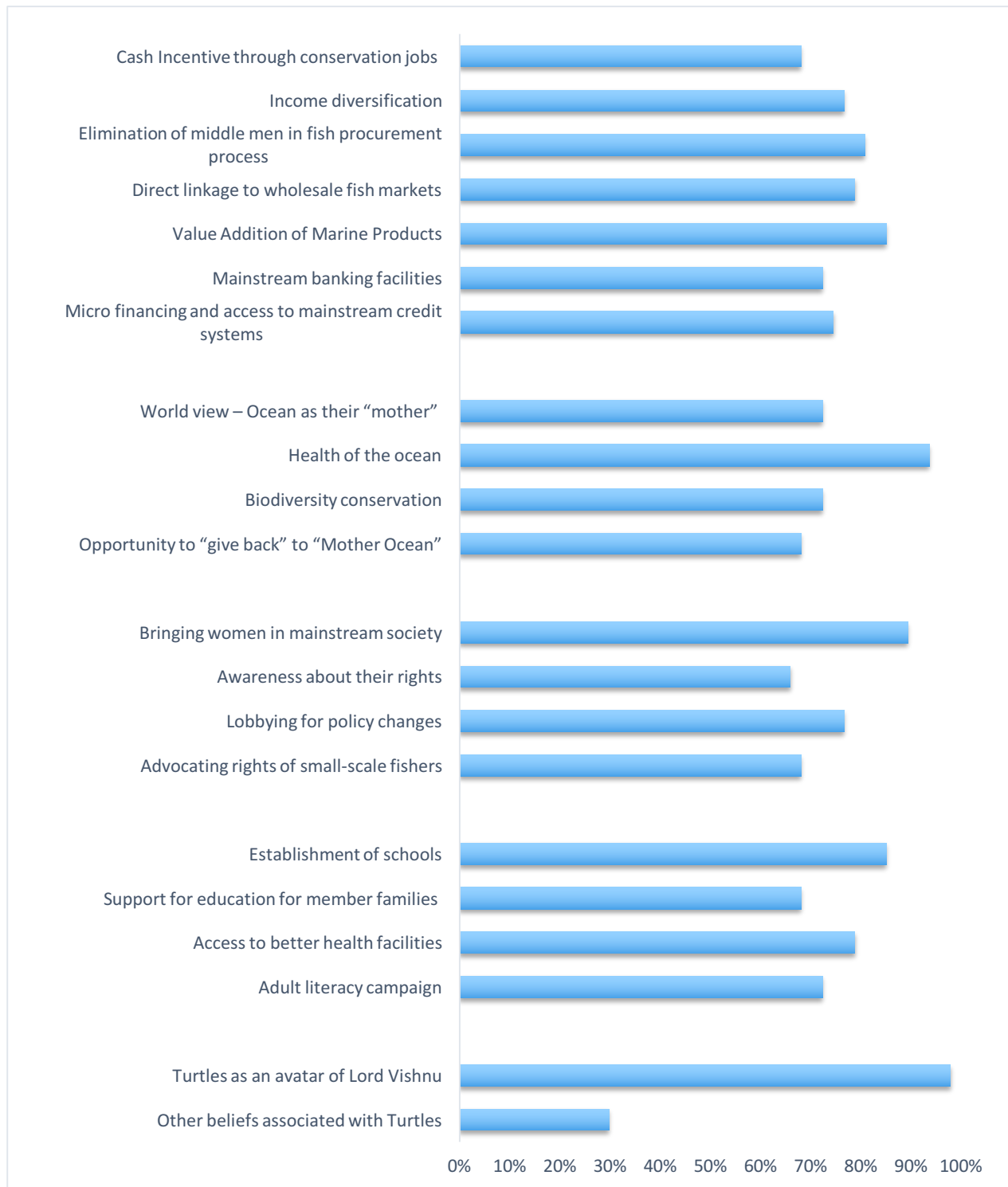


Fig 5.1: Graph showing various motivational factors for Community-based conservation in case of Samudram. The data for this graph comes from the semi-structured and key informant interviews. (Note: the total percentage is more than 100 as there are multiple responses for the same question)

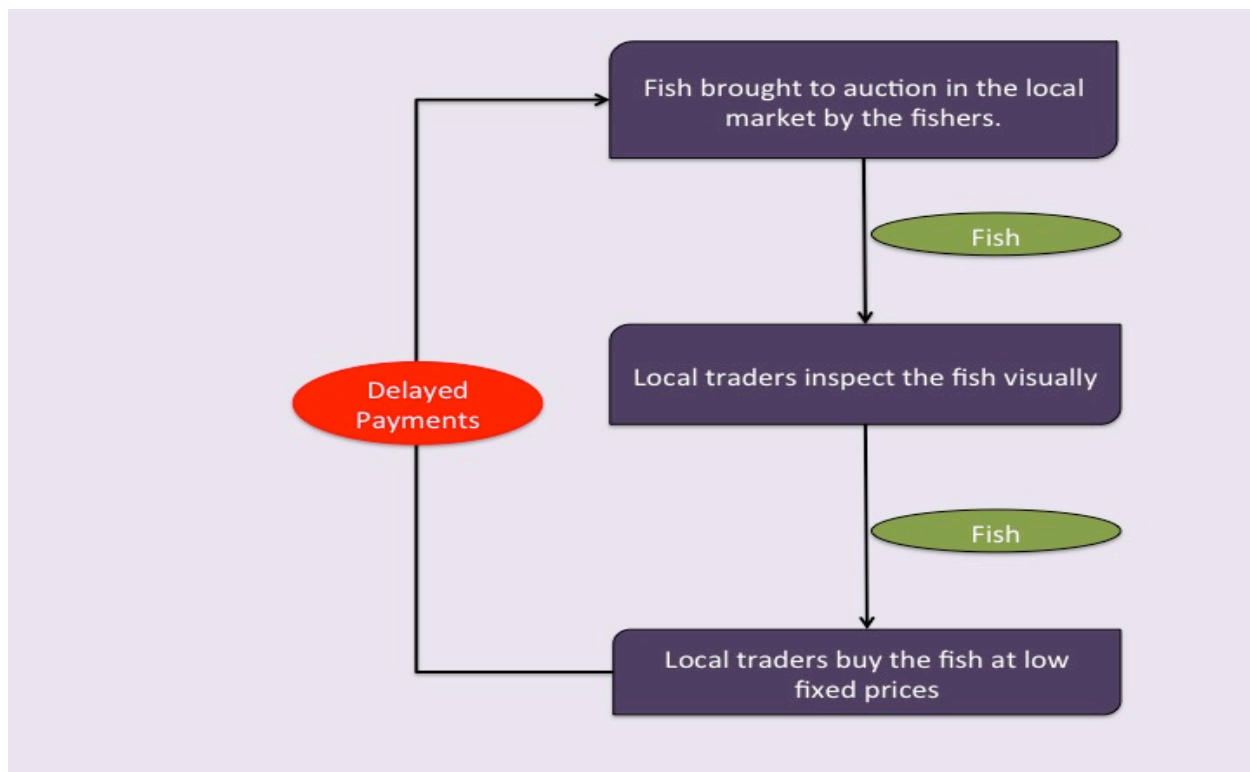


Fig 5.3: Price determination and Fish Procurement from traditional small-scale fishers before Samudram's Intervention

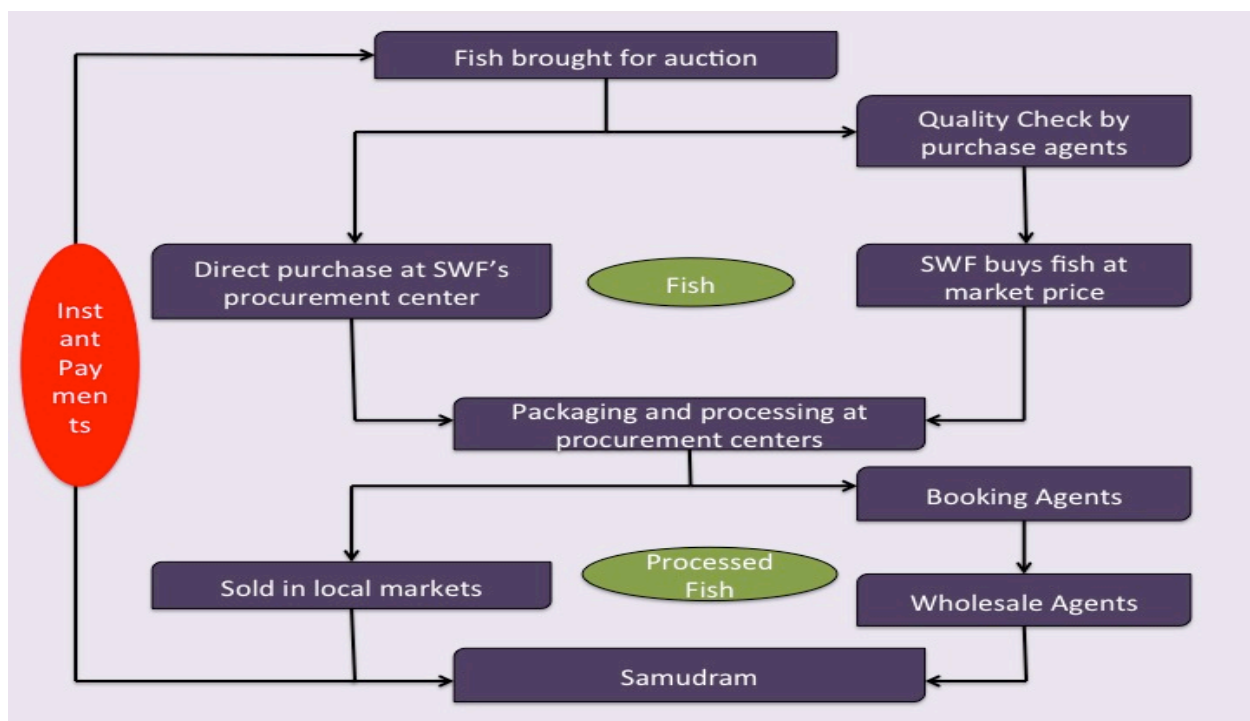


Fig 5.4: Price determination and fish procurement from traditional small-scale fishers after Samudram's intervention

5.3.2 Value addition of marine products



Plate 5.3: Samudram Employee packing processed dry fish

Almost 70% of the total marine catch in Odisha consists of low-priced fish such as ribbon fish (*Lepturacanthus savala*) and pink perch (*Zalembeius rosaceus*). These two species are often discarded or made into fishmeal. Samudram members took advantage of these low priced fish and turn them into processed dry fish, and pickles. Samudram provides training to fisher women in marine product diversification, hygienic cleaning and processing to make dry fish. After processing, the dry fish are segregated based on their quality: a) export quality; b) high quality; and c) regular quality (Plate 5.3). The export quality and high quality products are marketed abroad and to other major cities like Kolkata, Mumbai, Delhi, and Kochi. These dry fish are taken once every two weeks to the auction center where they are auctioned and sold to wholesalers.

Since Samudram came into the picture, fishing families make extra income by selling these fish as a value-added product and also marketing them at a higher quality. Samudram members also take part in various trade fairs conducted at different parts of Odisha, to market and sell their value-added products such as dry fish, fish pickle, shrimp pickles, papads, jurabaji etc. By developing and marketing these value-added secondary products members were able to increase the product price of otherwise low priced fish by up to 45 percent.

5.3.3 Financial Literacy Program

Understanding the plight of the small-scale fishers' families' dependence on illegal moneylenders and contractors, Samudram launched one of their flagship projects, the Financial Literacy Program. This program was aimed to connect every member household to mainstream banking and credit systems. Prior to Samudram intervention, most of the small scale fishing families were borrowing money at exorbitant interest from these illegal money lenders, which forced them to enter into phony contracts to sell their fish for a fixed price, which does not reflect market demand or fluctuations, as a means to repay these loans. In some cases, the money was even lending at a rate of more than 80-90% interest. With the aim of combating this evil, Samudram started a core fund, which was used to finance members during emergencies (cyclone, family programs). They also helped the community with low cost infrastructure and equipment for fishing. By linking the community to the mainstream banking system, government sponsored schemes and subsidies became accessible to Samudram members. In short, through Samudram the local fisherwomen gained access to collective saving opportunities, credit services and insurance coverage. In many cases, Samudram also helped the households by providing a guaranteed amount in acquiring loans for buying new boats or for repairing and upgrading existing fishing equipment.

Samudram's various economic activities - such as income generation through conservation activities; procuring, processing and marketing of fish; linking the local fishers to the wholesale markets ensuring fair pricing to the fishers; value addition; and marketing of diverse marine products - helped the fishing families to pay back their debts at a much faster rate, and get out of illegal contracts and thus ultimately freeing them from the vicious cycle of indebtedness. According to Resource Center for Development Cooperation (RCDC), Bhubaneswar, Odisha, the annual income of Samudram members saw an overall real increase of 25 to 30 percent (US \$458 in 2004 to US \$967 in 2009).

5.4 Environmental factors

Odisha is well known around the world for its mass-nesting phenomenon of endangered olive ridley sea turtles. Every year thousands of turtles travel to the Odisha coast to mate and nest. A decade ago the number of turtles visiting the Odisha coast began to decline. Samudram along with the Odisha Marine Resources Conservation Consortium (OMRCC) understood degradation of nesting beaches, entanglement of turtles in indiscriminate fishing equipment, pollution from aquaculture ponds and in some cases direct harvesting as the main reasons for the declining turtle count. Fisher folks are very familiar with the sight of olive ridley turtles along the Odisha coast. These turtles have been visiting the coast for thousands of years and people consider them as part of their life and cultural history. Hence Samudram and its members took this as an opportunity to “give back” to “Mother Ocean”. To protect these endangered olive ridley turtles, every year Samudram organizes beach-cleaning initiatives before the nesting period, during which the members go along the nesting beaches and clear them of plastic bags, debris and damaged fishing gear. They also constitute beach patrol teams, which conduct turtle counts, and mark the nests, and thus help other research organizations involved in turtle conservation to monitor and sample.

During the emergence of the hatchlings, Samudram members and their families celebrate this time by collecting the turtle hatchlings, freeing any entangled in any irresponsibly placed fishing gear and releasing them into the ocean (Plate 5.4 and 5.5).

During my interviews and focus group discussions, I found out that these fisher folks have some deep-seated beliefs about how to treat other living beings and their own “food basket”, the ocean. They consider everything as a gift from “Mother Ocean,” and ocean creatures such as turtles are seen as their brothers and sisters. Fishers take pride when thousands of turtles choose to return annually to their beaches to breed and nest and they take special care of these ‘visitors’. These fishers who are illiterate and are often considered as not having any knowledge about modern science, know that,

“the health of the ocean is depended on these turtles, if there are more turtles, the sea is healthy and there will be more fish”

Samudram has been a strong advocate of the importance community participation in government sponsored conservation measures. According to them, the fishers and their families are best equipped in regards of knowledge about the beaches, ocean and the biodiversity associated with it. They should be considered as the primary stakeholders, when it comes to marine management. In relation to the olive ridley turtles, one of the members told me;

“They (turtles) used to come here for centuries, who are we to stop them from coming here, in fact it is our duty to make them feel welcomed and protected”.

Every year Samudram publishes the data from their annual turtle count in their journal, and these data shows an overall of increase of 15% in olive ridley population visiting Odisha. Samudram also helps in creating awareness among the fishers about sustainable fishing practices

and marine biodiversity conservation (OMRCC, 2014). They are trained in monitoring, sampling and collecting data about fish stocks and fish landings. They also work with the Orissa Traditional Fish Worker's Union (OTFWU) in making sure that the fishers are using nets and gear that are not detrimental to the fish stocks and are of proper mesh size. They also monitor the use of turtle-excluding devices (TEDs). Samudram work with the Central Marine Fisheries Research Institute (CMFRI), a federal research organization under the government of India, in developing an artificial reef project.



Plate 5.4: Samudram members and family members trying to save the olive ridley hatchlings entangled in irresponsibly placed fishing gear

Samudram uses cement reef moldings and drops them in the sea. These artificial reefs not only deter bottom trawlers, but also improve marine biodiversity by providing breeding and spawning sites for fish, mollusks, crabs and other marine species. Samudram played a pivotal role

in successfully organizing traditional fish workers and lobbied against what they call “ill-conceived and short sighted” federal government policy to create coastal management zones that would open the door to industrial development along the already ecologically fragile Odisha coast. Samudram is a partner in opposing the development of Dhamra port 200 km north of the famous Gahirmatha Marine Sanctuary, which would affect hectares of mangrove forests and also almost half a million female turtles that nest in the sanctuary. Samudram, along with OMRCC, was an important advocate for inclusion and establishment of community conserved areas and the establishment of environmental and cultural heritage sites along the coasts, in India’s National Biodiversity Strategy and Action Plan of 2005. As Samudram’s leaders say,

“It would be a shortsighted (policy) measure, if the traditional fishers are displaced in the name of marine protected areas. Coastal ecosystem is very rich in biodiversity but (at the same time) very fragile, they need to be protected by those who know them best”.

5.5 Political Factors

Being a member of Samudram was a powerful way of empowerment for a socially marginalized segment of the population. Samudram created a platform for these traditional women fish workers’ voices to be heard. They were empowered and became aware of their own rights through improved self-esteem and dignity. As one of the members puts it,

“Being a (Samudram) member means a lot to me.... I am respected in my household and by other community members.... I am bringing in the change, it gives me more fulfillment and makes me proud”.



Plate: 5.5: Children of Samudram members holding the hatchlings before they release them into the ocean.

In short, Samudram focuses on empowerment through various skill development initiatives such as, capacity building through various training, livelihood diversification training, leadership camps and also conducting various awareness campaigns regarding financial and social wellbeing of the community. Most of the members belong to a lower caste and used to be inflicted with social exclusion and persecution by so-called “upper caste”. As another member said during the interview,

“There was a time I used to discriminated from using public buses, they wouldn’t let me in, (because) they say I came from fishing village... But now I know, no matter where I come from or what I do, I am not letting anyone treat me like I am no one”.

Samudram and its partners play a key role in organizing symposia and meetings with local government officials, elected officials, academicians and community leaders to discuss and lobby for their rights and necessities.

Samudram is actively involved in lobbying the government for policy changes that encompass the interests and priorities of small-scale fishers. In recent years Samudram have organized protests (*dharnas*) and marches against the government's plans to replace the "coastal regulation zone notification" with the "coastal management zone act"; plan to establish large-scale industries under the name of "special economic zones"; and other policies that would result in displacement of traditional fisherwomen. Samudram is opposed of large-scale mechanization of the fishing sector, as these measure would adversely affect the coastal ecosystems and detrimental to the marine biodiversity. Samudram calls for a less stringent, more inclusive licensing regime, to register community enterprises. In the past few years, Samudram's lobbying efforts proved to be successful, when the government agreed to ban destructive fishing nets, and to monitor bottom trawlers in territorial waters by amending and including budgetary provisions in the Orissa Marine Fisheries Regulatory Act (OMFRA). Samudram was successful in advocating better credit access and insurance and extending social security programs for the fishing sector workers to women involved in fishing related activities.

5.6 Social Factors

The leaders of Samudram realized that to bring a positive and sustained change to the living conditions of the traditional fishing families along the coast, they would have to start at the grassroots level. Many of these fishing villages were very isolated, without any schools or health care facilities nearby. Fishing families had very little or in most cases no access to primary healthcare or education opportunities. Most of the households did not have access to proper and

safe drinking water, electricity, housing or sanitation facilities. Through Samudram, in collaboration with other likeminded organizations and government agencies schools were established through *Sarva Shiksha Abhiyan* (The Education for All movement sponsored by both federal and state government), primary health centers were set up and lobbied the government to connect the villages to the grid bringing in electricity to most of the villages. All children of the Samudram members are being supported to attend the school through scholarships and distribution of school supplies. One of the members told me,

“When we were young, life was hard and the nearest school was 10 kms away. Today with the help of Samudram we were able to start a school in our village so that our children can learn to read and write”.

Samudram was instrumental in organizing periodic community medical check ups and bringing in health workers from awareness camps, which focused on topics such as HIV/AIDS, malnutrition, proper sanitation, family planning etc.

To spread literacy among the disadvantaged traditional fish workers, who never had an opportunity for formal education, Samudram opened adult education centers with the National Literacy Mission (a federal government sponsored adult literacy campaign), and organized night classes and weekend workshops for traditional fish workers who were taught to read and write. Thus through education the community had exposure to mainstream media and society, the members became more aware of their rights and in the end this empowered them. As one of the members said in her interview;

“We missed the opportunity to learn to read and write when we were young, the middle men and the money lenders took advantage of this but through Samudram we take

“National Literacy Mission” (NLM) program and now they have to think twice before they try to fool us”

5.7 Cultural and Spiritual Factors

Human history has shown intricate linkages between stewardship, spirituality and resource management. Religious and spiritual beliefs and traditions are considered to be fundamental drivers of human behavior in many societies. India, a country of diverse religious and cultural icons, has many mythical stories, beliefs and folklore about turtles. These religious beliefs and stories are so much engraved into people’s lives that they play an important role in day to day activities and decision making in the community’s life, whether it is for better or for worse. For example, the fishers offer prayers and offerings to Mother Ocean and *Varuna*, “The Hindu god of sea/water”. The turtles and ocean beings also makes their way into the religious beliefs of the communities living in the coast. The majority of these households self-identify as followers of the Hindu religion, where turtles are considered as one of the “Avatars” (incarnations) of Lord Vishnu called “Kurma”. Since Lord Vishnu is “the preserver” of life, these fishers consider it as their responsibility to protect the lives of these endangered sea turtles. In my interviews one of the elders in the community shared with me the story of Lord Vishnu’s “Kurma Avatar” (Refer the box below). Some members of the community consider protecting turtles to be their responsibility.

“It is our responsibility to protect them (the turtles) ... if we don’t, who will?” ... “Out of all the beaches, these turtles chose mine to lay their eggs. It means they trust us with their future and we are proud that they chose us and we make sure that we keep this trust”.

One can find many temples dedicated to them and you can find paintings and idols depicting Lord Vishnu as a turtle in Odisha and neighboring Andhra Pradesh, from where most of

the fishing families trace back their roots. According to another Hindu mythical belief, the world is believed to be resting on four elephants standing on the shell of a turtle. These beliefs about turtles play a huge role in bringing the communities together.

The Story of Kurma Avatar

Sage Durvasa was a great ascetic and equally irascible. One day he was walking through the gardens of heaven with a flower garland in his hand, and gave it to *Indra* (The leader of gods) who was riding his elephant *Airavat*. *Indra* disregarding the Sage's gift threw it on his elephant, which took the flower garland and trampled it. Seeing this *Durvasa* lost his temper and cursed *Indra*: "The pride of wealth has gotten to you. Let *Lakshmi* (the Hindu goddess of wealth and prosperity) forsake you". Hearing this *Lord Indra* realized his folly, bowed in front of the sage and sought his pardon. Heeding his apologies, the sage said "Lord *Vishnu* will do you good", and disappeared.

As the curse became a reality, *Lakshmi* left *Indra*, which made his life miserable. The demons that took advantage of this scenario invaded heaven, defeated *Indra* and gods in a war and occupied heaven. *Indra* lost his kingdom and the Gods in due course lost their immortality and valor. After couple of years in exile, *Indra* along with his teacher *Brihaspati*, *Brahma* (The Creator) and other gods, went to *Lord Vishnu* to put forth their appeal for help. Then *Lord Vishnu* said, "don't fear; I will show you a way out. You must gain the friendship of the demons and churn the sea of milk. Use *Mount Mandara* as the churning rod and *Vasuki* (The Serpent King) as the churning rope. When the sea is churned, you will get *Amrita* (Ambrosia), and if the Gods drink the *Amrita*, it will make them stronger and immortal. Goddess *Lakshmi* will be back with them and they will be able to defeat the demons and claim back heaven".

Brihaspati was successful in negotiating and gaining the friendship of the demons to work along with the Gods for this mighty task, promising them *Amrita* and wealth. The Gods and demons went to the majestic *Mount Mandhara* and successfully dug to uproot it from the plain it was sitting. When they tried to carry the mountain to the sea of milk, the weight of the mountain crushed many of the gods and demons to death.

Lord Vishnu presented himself to help them and revived the dead ones with his glance and asked his vahana (mount) *Garuda*, to carry the mountain on his back to the sea of milk. Once the devas and asuras got the mountain dipped in the sea, they tied *Vasuki* and started churning, the process continued for a long time without any hitch. After a while, the mountain started to sink into the seabed. *Lord Vishnu* came to the rescue again, he took the avatar of *Kurma* (half human-half turtle) went to the seabed and raised the mountain on its back and held it firmly for the devas and asuras to finish churning. The churning brought to surface the precious objects that was lost in deluge; *Sura* (Goddess of wine) *Apsaras* (celestial nymphs), *Parijata* (the wish granting coral tree), *Airavata* (the four tusked elephant), *Surabhi* (the cow that grants all desires), *Panchjanya* (the conch-shell) were some of them. After this spectacle, Goddess *Lakshmi* herself appeared from the sea, along with the king of seas, she was holding a floral garland and put it on *Lord Vishnu* and married him in front of all devas and asuras.

The Devas and Asuras continued churning the sea of milk, and ultimately Dhanvantari (the doctor of Gods) appeared with the sacred pot containing Amrita. Suddenly Asuras, breaking their promise, snatched the pot and took possession of Amrita for themselves. Lord Vishnu again came for the help of Devas by taking the disguise of a beautiful woman named Mohini. He tricked the demons and took the pot and asked them to sit in rows so that she could serve the Amrita. She switched the pots, while the Asuras were mesmerized by her beauty, and served Amrita to the Gods and intoxicating drink to the Asuras. The Gods drank the Amrita and became immortals and defeated the Asuras in a subsequent war and claimed back heaven for them forever.

Thus Lord Vishnu, the preserver of life, saved the Devas from mortality, through his second avatar as Kurma tortoise and prevented them losing their authority to the asuras, thus saving the mankind.

(As narrated by Parvathy and Saraswathy, Samudram Members)



Plate 6.1: Children making turtles in the sand



Plate 6.2: A street in the fishing village of Nolianuagaon

Chapter 6

Discussion and Conclusions

6.1 Introduction

This chapter presents the conclusions of the research. It is based on Objective three, to explore lessons learnt from this community-based conservation-development initiative, and it looks at the road for future discussion and changes that would enable Samudram to evolve in response to changing political, environmental and management scenarios that it faces. Some of these discussion points and recommendations come from Samudram, and go beyond the scope of the objectives of the thesis. They are included here because the Samudram, as the institution that enabled collective action toward community-based conservation, has a broader view of the issues and wanted these views to be reflected in the thesis.

6.2 Importance of community-based initiatives: Lessons from Samudram

Community-based initiatives tend to show (but not always) the capacity to bring people together to work for a common cause. They can help weave stronger ties and bonds within the community, making it more effective, cohesive and resilient. Samudram Women's Federation has shown itself to be a successful community-based initiative, focusing both on biodiversity conservation and socio-economic development.

Being a Samudram member was a way of getting empowered in a society in which women are traditionally disadvantaged. They became aware of their rights and abilities that enabled them to spearhead the movement of change in their communities. They not only gained respect from other members of the community, but most importantly self-respect for themselves, which in turn boosted their self-confidence, thus equipping them to expand their frontiers.

By growing into a state level community-based conservation development initiative and a social enterprise, with more than 5,800 women members, Samudram became a strong and successful advocate of participatory governance in the field of conservation of marine resources, and rights of small-scale fishers. Samudram's prime argument is that small-scale fishers live on the beaches and estuaries, which are biophysical interfaces between terrestrial ecosystems and marine ecosystems. Hence, they are more knowledgeable about the changes happening in these ecosystems and better equipped to manage them. Samudram members want more participation of small-scale fishers in developing policies that would reflect a holistic approach in conservation and resource management and would be sensitive to local livelihoods, thus ensuring balance between ecological goals of conservation and socio-economic goals.

6.3 Motivations for Community-based Conservation Initiative

Samudram provides a framework for conservation, without which government regulations alone would probably be insufficient. What enables turtle conservation is the fact that Samudram membership provides social and other benefits. Cash income from NGO contributions and indirectly from Samudram's own activities is an additional incentive, along with empowerment through Samudram's work. Government regulations banning the killing of turtles are important, but perhaps not really as important as the local cultural value of turtles, as turtles are believed to be an avatar of the Hindu god, Vishnu.

Motivational factors for this particular community-based conservation development initiative included economic factors such as income generation through conservation activities, developing sustainable and alternate livelihood strategies, marketing of value added marine products, and enabling communities to have better access to credit, insurance and social assistance systems by linking them to the mainstream banks. The members were also helped through

collective saving opportunities and access to micro financing. Being part of Samudram and bringing in changes in their own community in the form of social, educational, and infrastructural developments were reasons to be proud for many of these members. They were empowered through Samudram's capacity building programs, and through exposure to mainstream media, they were made aware of their rights and successfully lobbied against policies that suppressed the interests of small-scale fishers.

Spirituality and worldviews play a very important role in motivating conservation as this community-based initiative's major objective. Deep-seated beliefs about how to treat other living beings shaped conservation goals and activities. Values associated with place and culture also played an important role in shaping Samudram's conservation strategies. The fishers are very familiar with the sight of millions of turtles on their beaches and take pride in the fact that these turtles come back every year to their beach. They consider these turtles as part of their life and cultural history. In addition, as noted previously, turtles are considered as one of the avatars of the Hindu God, Lord Vishnu, the preserver of life. Thus community members consider it as their responsibility to protect these endangered turtles.

In short it was the presence of many interlinked and complementing factors, including economic, environmental, social, political and cultural, that enabled or motivated this community based conservation initiative to take up conservation and stewardship. Fig 6.1 summarizes these various clusters of motivational factors which I identified in the case of Samudram. Samudram and other community members understand and acknowledge clearly the intimate linkage between healthy ecosystems and healthy socio-economic systems leading to conservation.

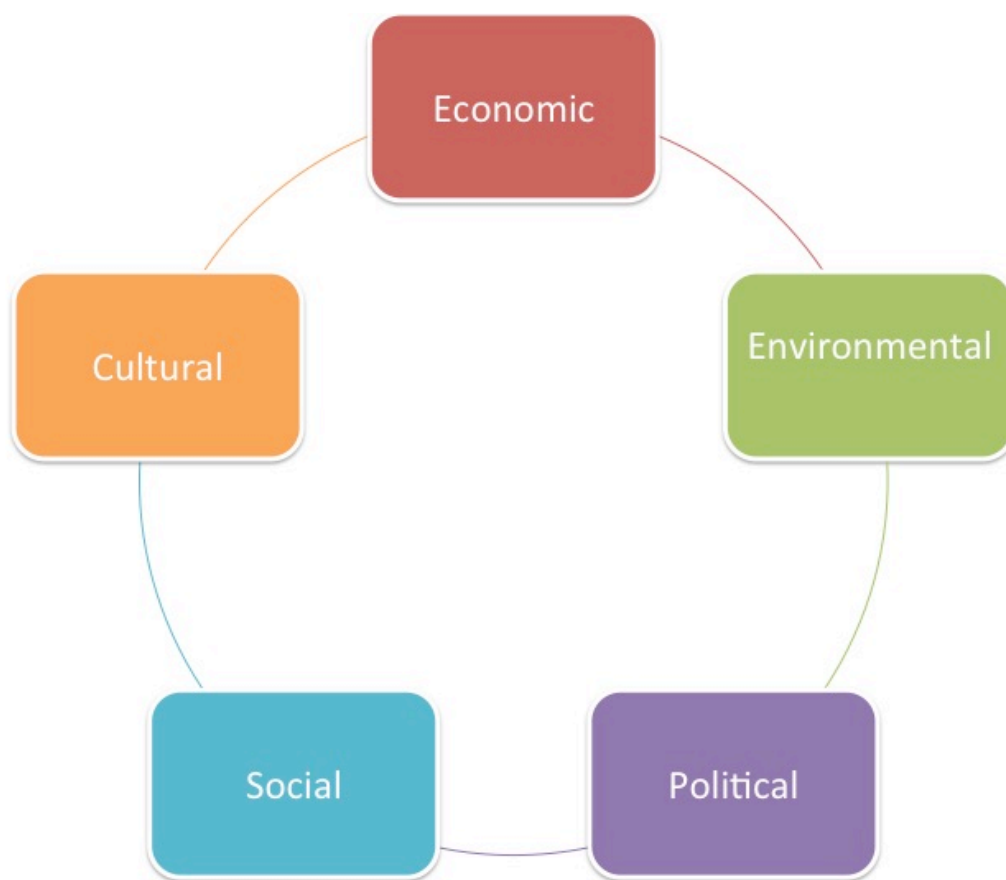


Fig 6.1: Link between various clusters of motivational factors for this community-based conservation initiative

6.4 Learning from Samudram: What fishing communities want to see

This study identified some recommendations that would help Samudram reach its goals. According to Samudram, a number of measures are needed to protect fisher livelihoods.

1. The present system of conservation solely entrusts the forest department with powers that are often abused at the village level. Samudram advocates that traditional fishermen must be made partners in conservation efforts at all levels.
2. No traditional fishing gear should be banned without adequate and scientific study. Fish workers displaced due to a ban on any particular gear should be provided with adequate financial assistance for shifting to any other allowable gear.

3. Areas within the Gahirmatha Marine Sanctuary (GMS) that do not have turtle congregations should be declared as buffer areas. Within these buffer areas the existing fishing restrictions need to be revised to allow traditional fishing practices that do not impact turtles.
4. In case of a complete ban on any particular area for a particular period, all affected fishermen must be compensated for the loss of income for that period. Adequate financial allocations for this purpose must be a component of the conservation program.
5. Traditional fisher folk using traditional gear should be differentiated from those using mechanized gear like trawl nets.
6. For each of the turtle congregation areas, joint management/ monitoring committees comprising of traditional fishermen, officials and scientists should be formed. This committee should decide upon the exact period, nature and extent of restriction on fishing activities depending upon field observations.
7. There is need for considerable improvement of the scope of legislation for turtle protection, especially with regard to turtle-fisheries interactions. Instead of total protection regimes for turtles, it may be judicious to move into conservation regimes for all the coastal living resources, including turtles. In Odisha, as well as in other parts of India, there is a need to develop conservation plans not only for marine fisheries within territorial waters but also for the whole of the exclusive economic zone.
8. The government authorities need to make sure that 5 km near-shore 'non-trawl zone' which is promised under the OMFRA is strictly implemented. Protection of reproductive patches is an efficient and cost effective conservation method. There

should be no blanket proscription of all forms of gillnets, which is the mainstay of the fishers of Odisha.

9. In the implementation of turtle conservation measures, right of safe passage through the marine sanctuary and 'no-fishing zones' should be better recognized and protected.
10. Compensation should be given for livelihood opportunities foregone. A compensation package for fishing opportunities foregone should be worked out, including provisions for earning an alternative livelihood. Incentives to switch to more selective gear should also be considered.
11. A proper operational definition of fishing in fisheries legislation is needed. There should be effective and transparent ways to determine what constitutes fishing within the marine sanctuary or 'no-fishing zones'. An improved understanding about turtle - fisheries interactions would help. Awareness and training programs in this regard should be undertaken among fishing communities.
12. Reliable socio-economic data about communities dependent on fisheries resources in turtle habitats could be collected to better assess the impact of turtle conservation measures on local livelihoods.
13. Satellite-based Vessel Monitoring Systems (VMS) and Global Positioning Systems (GPS) should be introduced to track fishing vessel movement in fishing grounds. All mechanized fishing vessels should be monitored using such a program with financial assistance from the government. Hand-held GPS instruments should be distributed to fishers in both mechanized and non-mechanized categories so that if prior information is given to the fishers about the location of reproductive patches, they can, with the aid

of GPS, determine the location of such patches and avoid fishing there. All fishers should be prohibited to fish in such patches

6.5 Moving Forward

In my study, there was little evidence that the government ever consults with fisher organizations or fisheries. However, it is clear from the findings that conservation is possible only because the Samudram and the fishers. Therefore, traditional fish workers must be made equal and effective partners in conservation efforts at all levels. There should be greater dissemination of information about conservation measures and regulations in place, particularly among fish workers. This, in combination with professional training of enforcement officers responsible for apprehending fishing vessels, should ensure that unnecessary harassment of fishers and increasing opportunities for bureaucratic corruption, are avoided. Conservation programs should take a holistic, ecosystem approach towards conservation, management and sustainable use of all the coastal and marine living resources, including turtles. Conservation programs should address the range of factors that contribute to turtle mortality, including non-fishery factors such as industrial and urban pollution of the sea, development projects such as ports, military establishments and operations, oil and gas exploration, mineral mining from the coastal areas, intensive prawn culture, collection of prawn seeds (larva) with fine-meshed nets, and uncontrolled and irresponsible tourism.

Another interesting finding of this study is that, the success of Samudram, as a community based conservation development initiative, was through capacity building and developing additional as well as alternate economic opportunities. Hence, more capacity building, leadership and entrepreneurial training programs should be made available through government agencies. This would enable Samudram to reduce their dependence on external agencies and foreign donors

to fund their activities. Policy level actions that would empower small-scale fishers include developing new markets and marketing strategies for their product, and reducing “red-tape” for faster distribution of cyclone aids to affected families in fishing communities. Government should work along with village communities in rebuilding and making repairs of shelters and other infrastructure damages due to cyclones and other natural disasters such as flood and landslides.

A potential that Samudram could explore is in the area of community-based ecotourism. Odisha coast’s unique features such as proximity to the hills of Eastern Ghats, magnificent temples, the Chilika lagoon, mangrove forests and world’s largest mass-nesting site for the olive ridley’s should make Odisha a top destination for ecotourism. However, lack of proper infrastructure and/or proper maintenance of existing facilities is a big hurdle in attracting tourists to the Odisha coast. Samudram could use its outreach and social enterprise capacity in developing tourism infrastructure, encompassing ideas of sustainable cultural tourism. Successful cases of community-based turtle tourism in Sri Lanka, Australia, Cayman Islands, Grenada, Latin America and many other parts of the world could be used as models for developing these opportunities (Richardson, 1994; Hewavisenthi, 2001; Wilson and Tisdell, 2003; Tisdell and Wilson, 2005; Bell *et al.*, 2008).

Authorities should work with communities to develop basic infrastructural facilities, not only for tourists but also for the needs of the communities themselves. Building for tourists could also help improve facilities for the communities. Some small-scale fishing communities lack even basic facilities such as safe drinking water, sewers, toilets and proper roads to connect them to the national highways. Even though various government and non-governmental agencies has been working for years now to build these basic health and physical infrastructure, little actual work has been done.

Samudram being a representative of small-scale fishing communities should be made an integral part in the decision making processes directly or indirectly affecting these communities living on the coast. Controlling and monitoring of large-scale mechanization in the fishing industry and development of special economic zones and ports along the Odisha coast must be done in consultation with these small-scale fishers, as they are the holders of knowledge about the marine environment.

6.6 Conclusions

Community-based conservation is a complex process (Agrawal and Gibson, 1999). When it works, it helps foster a holistic approach that is sensitive to local livelihoods. It also tries to achieve a balance between ecological goals of conservation and social-economic ones. Quite often, it also includes the political goal of empowerment (Berkes, 2013). Conservation-development projects, having the advantage of giving priority to livelihoods, in turn, make conservation feasible (Timmer and Juma, 2005; Berkes, 2004). Hence, Equator Initiative projects are good candidates for community-based conservation (CCRN, 2012).

Samudram Women's Federation has shown itself to be a successful community-based initiative, focusing on both biodiversity conservation and socio-economic development. Given that Odisha is a relatively poor state of India, and that fishing communities tend to be poorer than other kinds of communities, it is perhaps surprising that Samudram is able to engage in large-scale turtle conservation in such a successful way. How is this possible? No single factor provides an explanation. The answer lies in the presence of many complementary factors (economic, environmental, social, cultural & spiritual) that enables and motivates the community to take up conservation and environment stewardship.

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Appendix A

Ethics Approval Form



Research Ethics and Compliance
Office of the Vice-President (Research and International)

Human Ethics
208-194 Dafoe Road
Winnipeg, MB
Canada R3T 2N2
Phone +204-474-7122
Fax +204-269-7173

APPROVAL CERTIFICATE

May 8, 2014

Canada Research Chair

TO: Alex V. Zachariah (Advisor F. Berkes)
Principal Investigator

FROM: Susan Frohlick, Chair
Joint-Faculty Research Ethics Board (JFREB)

Re: Protocol #J2014:039
"Motivations for Community-based Conservation: A case from Odisha, India"

Please be advised that your above-referenced protocol has received human ethics approval by the **Joint-Faculty Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement (2). **This approval is valid for one year only.**

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- If you have funds pending human ethics approval, please mail/e-mail/fax (261-0325) a copy of this Approval (identifying the related UM Project Number) to the Research Grants Officer in ORS in order to initiate fund setup. (How to find your UM Project Number: <http://umanitoba.ca/research/ors/mrt-faq.html#pr0>)
- if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.

The Research Quality Management Office may request to review research documentation from this project to demonstrate compliance with this approved protocol and the University of Manitoba *Ethics of Research Involving Humans*.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/orec/ethics/human_ethics_REB_forms_guidelines.html) in order to be in compliance with Tri-Council Guidelines.

Appendix B Consent Form



UNIVERSITY
OF MANITOBA

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

303 – 70A Dysart Road
Winnipeg, Manitoba
Canada R3T 2N2
NRI General Office 204 474-9373
Fax: 204 261 0038

Research Project Title: Motivations for Conservation and Environmental Stewardship

Researcher: Alex Zachariah, M.N.R.M. Student

Sponsor: Canada Research Chair by Dr. Fikret Berkes

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

Project Summary: This project is being conducted as part of my Masters degree in Natural Resource and Environmental Management program through the University of Manitoba. The primary objective of this study is to look into the various motivations that lead to environmental conservation and stewardship. It would also explore how these motivations for conservation are closely linked to concerns about sustainability of the local economy and livelihood. This study will provide insights into the community's perceptions about conservation and what motivates them to do it (or not to do it). It also aims to explore the "lessons learnt", which could be used to develop capacity building, knowledge generation and policy strengthening in similar community-based conservation initiatives around the world

Research Timeline: Data collection (active participant observation, interviews and focus groups) will be carried out between April and June 2014. As a research participant, you will be involved in individual semi-structured interviews and/or a focus group. Interviews are expected to take approximately thirty minutes to one hour. Focus groups are expected to last between one and a half and three hours. I will request that you permit me to digitally record our conversation, but if you object I will transcribe it by hand.

Participation in this project is voluntary and you may decline to answer any question or withdraw from the study without any negative consequences regarding any program or initiative discussed in the interview.

Please initial here if you would like to receive all reports produced based upon this research _____

Confidentiality: I will keep any information gathered in this research strictly confidential. All data will be identified only by code number with the code key stored separately to ensure to direct linkage can be made between individuals and the raw data. Data will be kept in a locked cabinet. Only my advisor and myself will have access to the data. You will not be named or identifiable in any reports of this study. If any statement you made during this interview is used in a research report it will be attributed to an anonymous source, unless you request otherwise. Full masking, however, may not be possible. Others may speculate or make inferences as to the identity of research participants and who said what.

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

Risk and Benefits: No information will be used in a way that could put at risk the integrity or safety of participants. There may be a short-term benefit to you in terms of having an opportunity to tell a concerned listener about personal experiences related to how you form symbolic attachments to particular places and what these places mean to you. In the long-term, you may benefit if the findings of this research help persuade government officials and other policy-makers to change in a positive direction policies that directly affect you.



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NRI General Office 204 474-9373
Fax: 204 261 0038

Dissemination: Results from this research will be disseminated at academic conferences, and by publication in academic journals and a Master's Thesis. Neither your name, direct quotations, nor photograph will be used in any publication without consent. The information resulting from this interview/focus group will be kept confidential. If you wish to retain anonymity, a participant number, rather than your name, will be used to identify you on transcripts and any other reproductions of the information you provide. No one other than myself will have access to the real names of interviewees who choose to remain anonymous. The findings from this research project will be made available to community members. A copy of the Master's Thesis, a summary of findings in English or local language, as well as any other publications resulting from this research will be shared with community-based organizations, as well as any participant requesting these materials.

Compensation: No financial compensation will be provided either directly or indirectly to participants for their contributions to this research project.

Consent: Please indicate whether or not you agree to the following:

Yes /No	1. I agree that the researcher may use a digital recording device during this interview/focus group.
Yes /No	2. I agree that the researcher may take notes during this interview/focus group.
Yes /No	3. I agree that the researcher may cite my name and directly quote me in future publications. I understand that as a result it will be possible for others to recognize me. (Please, feel free to answer this item at the end of the interview)
Yes /No	4. I agree that the researcher may directly quote me using pseudonym rather than my real name (Please feel free to answer this item at the end of the interview)
Yes /No	5. I agree that photographs of myself may be taken and used in presentations, reports and publications connected to this research.
Yes /No	6. I wish to receive a summary of this interview/focus group.

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

Alex Zachariah
Graduate Student Researcher

zachar12@myumanitoba.ca

Fikret Berkes
Faculty Advisor

fikret.berkes@umanitoba.ca

This research has been approved by the Joint-Faculty Research Ethics Board of the University of Manitoba. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 1 (204) 474-7122, or e-mail margaret_bowman@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

Participant's Name (Printed)

Participant's Signature

Date

Researcher's Signature

Date

Appendix C

Open ended question guide for semi-structured interview

Personal history of the participants

- What is your primary occupation?
- Are you a member of Samudram Women's Federation (Samudram)?
- If yes, since when?
- What kind of fishing practices (boats, nets, fish catch, marketing) do you use/follow?

Samudram Women's Federation (Samudram) related

- Since when are you involved with Samudram and their activities?
- What is your role in the organization?
- How does Samudram work?
- Who takes the decision at the federation level? How is your community or "*Nari Seva Sangh*" (NSS) represented there?

Motivations for conservation related

- How did you get associated with Samudram?
- What motivates you to be a part of Samudram?
- How are involved in their conservation activities?
- Is there any kind of benefits that you receive by being a part of Samudram?
- If answered yes, what are those?
- What would you say to someone who is a new member or wants to become a member of Samudram?

Community-based conservation related

- What do you think about the turtles visiting the Odisha coast?
- Why would you conserve/protect them?
- How would you describe the government policies that are in place for turtle conservation?
- Do you think OMFRA is helpful in safeguarding traditional fish worker's interests?
- What do you think about the fishing bans and restrictions?
- What is your opinion about community participation in conservation?
- How would you describe the situation before and after SWF intervention in conservation?
- How would you describe the relationship between the community members and government conservation officials?

Impacts: Conservation and Livelihood

- Would you say community-based conservation is effective?
- Do you notice any change in turtle population before and after the fishing bans were in place?
- Do you any change in turtle population before and after SWF's intervention?
- Is there any significant change in how community sees turtle conservation now?

- What are the challenges that Samudram is facing?
- How do you think Samudram can overcome various challenges that it is facing now?
- Where do you think Samudram will be in the next five to ten years?
- Is there anything that you would like to see change with respect to turtle conservation and plight of small-scale fishers in Odisha?

Appendix D

Major Turtle Conservation Measures and Related Laws in Odisha (Sources: Sridhar, 2005; WII, 2009; Mazoomdar, 2013)

Year	Laws/Acts/Orders/Amendments
<i>Species Related</i>	
1972	India passes the Indian Wildlife (Protection) Act (WLPA). The olive ridley Turtles are currently listed under the Schedule 1, which guarantees them maximum protection
<i>Fisheries Management Related</i>	
1982	Orissa State Government passes Orissa Marine Fisheries Regulations Act (OMFRA)
1983	OMFRA Rules were introduced and fishing zones for different fishing crafts were established
<i>Habitat Protection Related</i>	
1994	The Orissa Marine Fisheries Regulation Act (OMFRA) prohibited all kinds of fishing close to the Gahirmatha beach off the Bhitarkanika National Park, round the year.
1997	Gahirmatha was declared as a Marine Protected Area (MPA) under the WLPA
2003	State High Power Committee (HPC) recommends establishing wildlife sanctuaries around Debi and Rushikulya river mouths
<i>Fishing Rights Related</i>	
1998	State HPS bans fishing in Gahirmatha Marine Sanctuary (GMS)
<i>Fishing Gear Regulations Related</i>	
1997	Section 2(b) of OMFRA was amended, making TEDs mandatory on all trawlers and ordered to use TEDs beyond 5km from the seashore throughout the year. Failing which,

	<p>fishing licenses will be cancelled without options for renewal.</p> <p>The state High Power Committee (HPC) issued an order permitting only catamarans and small crafts using motors of less than 10hp and with only monofilament nets within the buffer zone of the Gahirmatha Marine Sanctuary.</p> <p>The Odisha Government made amendments to the OMFRA making it mandatory for all “mechanized fishing vessels” to operate using TEDs.</p> <p>HPC issued an order prohibiting fishing by trawlers and gill nets in the mouth areas of Dhamra, Devi and Rushikulya rivers from 1st November to 31st May, every year.</p>
1998	
2001	
2003	