

Rethinking Chilika Fishery: A Reflexive Understanding of Decentralized Governance of Natural Resources

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for the degree of Doctor of Philosophy in Regional Studies**

By

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DECLARATION

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has made presentation in the following conferences:

1. 34th Institute of Indian Geographers’ Meet and National Conference at the Centre for Earth Science Studies, Thiruvananthapuram, Kerala, 2012, (National/International)
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Chapter 1

The Idea of Place in Decentralized Governance of Natural Resources

1.1 Governing the natural resources: Issues and outcomes

Post 1980, several international accords have been signed to involve communities in managing natural resources and in developmental projects. Similarly, for sustainable development, the Brundtland report of 1987 flagged the need for incorporating community knowledge and participation in decision-making over use of natural resources. While these shifts in managing natural resources were being advanced we witnessed resistance from people, across the country, against state's approach towards developing the natural resources. Narmada Bachao (Amte 1991), Chipko movement (Bhatt 1991), Apiko movement (Hegde 1991), Silent Valley Movement (Parameswaran 1979) and other such environmental movements are all exemplars that called upon the state to revisit their Natural Resource Management (NRM) policies (see Swain 1997; Gadgil and Guha 1994). The state's development policy undermines the crucial connection of locals with nature was the main argument of people's movements. In addition, there were judicial interventions, and the civil society demanded revisiting centralized and economic attitude of state towards environment and natural resources (Baxi 1991). These developments are the foundation to policies that have been instituted since then to manage natural resources in India. For example, a shift has come about through amendments to the constitution, and similarly through pragmatic interventions.

Shift in the locus of the decision making

The 73rd and the 74th Amendments to the Constitution mandated planning be undertaken at local levels. The amendment directs state to promote local institutions for self-governance in the provision of public services, the creation and maintenance of public goods, and planning and implementation of developmental programs. As a follow up to the amendments, several initiatives have been placed. These include: Wildlife Protection Act (2003), Biological Diversity Act (2004), and the Scheduled

Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006. All these legal initiatives reflected aspirations enshrined in the amendments to the constitution of India are instances of leading to Decentralized Governance of Natural Resources (DGNR) regime. The state through/in the 11th five year plan (2007-2012) boosted decentralized management of natural resources¹ (GOI 2011). Among the initiatives placed for DGNR include: establishment of Water User Associations (WUA), Joint Forest Management Committee (JFMC), Primary Fishing Cooperative Societies (PFCS), Community Biodiversity Organization (CBO), and Area Based Organization like forest divisions, wildlife divisions, and local development authorities (GOI 2001, 2006, 2006a, 2006b, 2007, 2007a, 2011). By establishing these initiatives, one surmises that environmental governance is taking place at local level, that is, at the level of communities, municipalities, villages, and other designated conservation units. In general, an increasing number of such institutional arrangements indicate a shift in state's natural resources management approach; from top down to bottom up, and from managerial approach to governance.

DGNR is promoted with an assumption that decisions will be judicious at local level and reduce social and gender disparities (GOI 2006). Through DGNR it seems the state hopes to draw on both 'experiential knowledge' of local people, and 'statistical knowledge' of state in understanding issues of resources management. Accordingly, DGNR has been promoted by the state to advance participation by a broad range of voices representing diverse values in decision-making. A participatory understanding of issues is viewed as an alternative to centralized and technocratic understanding of resource management. Through an investigation of several case studies in the country, Aseem Shrivastava and Ashis Kothari (2012) argue that traditional community organizations are sites for applying democratic principles to ecological protection. Nuijten (2005) drawing on Bourdieu's concept of habitus has cautioned that beyond acknowledging community participating, one has to recognize that local traditional practices are embodied with internal power structure of the community.

¹ Working committees were constituted for each sector of natural resource management, i.e., agriculture; forestry; wildlife and biodiversity; water; river, lake, and aquifer; and also for Panchayat Raj. All these committee reports emphasized decentralizing management of natural resources, and for participation of locals in decision making (GOI 2006, 2006a, 2006b, 2007, 2007a).

Despite implementing DGNR for over two decades, managing natural resource continues to be a conundrum, because wide ranging processes and factors that are specific to places seems to shape the outcomes.

Assessing implementation of DGNR

A review of literature reveal several reasons for ineffective implementation of DGNR. For example, Jesse Ribot (2002, 2004) has found that devolution of power has not accompanied decentralization in decision-making. Consequently, the locus of local decision-making is with state nominated representatives to various local bodies, who are unaccountable to the community. Such a drawback in participatory approach is noted down as elite capture (Lund and Jensen 2013; Platteau 2004). Arun Agrawal (2005) argues constitution of Community Based Organizations (CBO) for environment protection as subjection of state rather than empowerment. Similarly, Naz (2014) argues that existing conceptualization of community as a homogeneous entity with an agreed interest is a drawback and results in for ineffective implementation of DGNR.

Besides the above noted limitations, researchers have questioned some of the basic assumptions that undergird DGNR. For example, the assumption that members of a decision-making body are uniformly assigned power and authority to exercise is not to be found in practice. More often than not, a select number of individuals and groups seem to dominate deliberations of decision-making body and thereby shape outcomes in favor of themselves. Similarly, many of the decisions in DGNR rely on scientific knowledge, expertise of outsiders, and evidence from laboratory models and algorithms (Dujovny 2009).

There is minimal involvement of communities in decision making and therefore experiential knowledge is excluded. This is because local or situated knowledge is viewed, by, say, conservation planner, as particularly representing insider's view, and therefore, not valuable to develop an explanation and draw a generalized pattern and therein seek causal explanation. For instance Kalpagam 2015 find emergence of statistics, which has its root on positivism, as powerful language in shaping state's understanding of issues. Wynne (1996) find that state's knowledge often

impose externally experimental knowledge and solution to local issues, by undermining local knowledge. Similarly Agarwal (2010) has found that women's representation in local decision-making, which is guaranteed under the constitution is illegally usurped by the men; and that often women's role is symbolic and/or women are acting at the behest of men. In another instance, de Souza (2010) has documented how few individuals/groups capitalized on their status in the community, caste and in possession of other capitals to appropriate benefits for themselves. One can therefore, arguably, say that the transition from centralized governance of natural resources to DGNR is incomplete. This is because the basis of decisions continues to mimic centralized decision-making, and there is a negligible inclusion of local knowledge or experiential knowledge in DGNR. There are however, deeper explanations on the failure to incorporate experiential knowledge in DGNR. For example, the ontological assumption that undergirds DGNR is that there is a meaningful reality that exists independent of human consciousness. This is objectivism with a belief that there is single truth; and thereby undermining experiential or subjective understanding, which is based on the premise that there can be no single truth.

Besides objectivism, treatment of 'place' in the design and conceptualization of DGNR, is one other assumption being scrutinized by researchers. There are two ways in which place is visualized in DGNR. First, decentralized governance is for a physically bounded area wherein the community and natural resources relationship is to be managed. Instances of such institutional arrangement include: creation of forest divisions, administrative zones for wildlife, and creation of development authority for managing a wetland area. And in the second conceptualization, that is, community based governance, place is a geographic location, such as village based organization, namely *Van Sanrakshan Samiti*, *Pani Panchayats*, Water Users Association, Community Biodiversity Organization, and so on. In both these ways, whether area-based *or* community--based, place is a physical entity, and a dualism of nature and society is assumed in the implementation of DGNR.

When above noted limitations are intrinsic, DGNR itself becomes vulnerable, that is, DGNR is not reflexive of its own assumptions. Larson and Soto (2008) have

in fact advocate reexamining application of various concepts of decentralization in relation to each other, i.e., of development, participation, and citizenship.

In sum, we find that questions raised through the assessment of DGNR continue to plague the efficacy of DGNR initiative. Our society is at a crossroad, how we may effectively govern natural resources remains an intractable problem. Seen together, evidence from literature suggests there is a need to revisit assumptions to reconceptualize DGNR. In particular finding a way to mainstream experiential knowledge in DGNR remains a challenge. In this dissertation I therefore argue in favor of redefining the idea of place in DGNR because 'place' offers the promise of bringing together scientific and experiential knowledge. A redefinition of place is based on ideas of everyday practices, reflexivity, habitus as advanced by sociologist Pierre Bourdieu, and emplaced self as suggested by philosopher Casey.

We know participatory conservation needs to be strengthened and from recent studies on decentralization reveal that there is a gap between state's intention for meaningful involvement of local and extending power of state to regulate people and their institutions (Agrawal 2005; Ribot 2004; Scott 1998). In decentralization one aims to devolve power from central authority to local institutions, reconciliation of socio-economic development with conservation, integration of traditional/local value and wisdom, and protection and legitimization of local/indigenous right over natural resources (GOI 2006, 2006a, 2011). Such objectives of DGNR are often found compelling, especially in policy advocacy. There are however some counter arguments that see decentralization by state as possible way to reduce costs, deflect blame, or extend state's reach further into social processes (Agrawal 2005; Agrawal and Ostrom 2001; Lele 2014). At micro-level deficiency of implementation of DGNR is more evident than the expression of effectiveness of DGNR (Kellert et al. 2000). The potential of the proposed visualization of place is examined in this dissertation. Next, I briefly detail the idea of place as applied in this research work.

1.2 Understanding place: A framework for research study

The idea of place adopted in this research is advanced by geographers, especially by David Sack (1992), Robert Sack (1990), David Ley (1977), and Nicholas Entrikin

(2001). The conceptualization of place suggested by geographers are oriented and have roots in the everyday perspective. Everyday perspective is put forward in contrast to theoretical model² that failed to decode everyday phenomenon. This may be because the everyday human use of time and place is complex as it evolves out of complex relation among context, situation, and agents performing the practices (Ellegård 1999). An understanding of practices –carried out in everyday time frame- is regarded as reflexive. Reflexive understanding, as advocated by Pierre Bourdieu and other post structuralists and postmodernists, rejects binaries of structure versus agent and objectivism versus subjectivism. As an extension of this understanding, I argue that a reflexive understanding of practices also eliminate the binaries between man versus nature. Everyday practices are environmentally situated. This thesis puts forth an argument that everyday practices are place specific. Place in this work believed to be inseparable from everyday practices, which are performed and constitutes that particular place. Human-nature relationship at local level is embodied in everyday practices and experiences. People understand natural resources and their issues through these everyday experiences, which constitute places.

Understanding everyday practices means understanding life-world³. Thus, through everyday perspective, one gets a phenomenological interpretation of the relation between people and their environment; and thereby rejects singular explanations, be that of environmental determinism or structural determinism. This is because all the three constituents are given equal importance in the post-modern conceptualization of place.

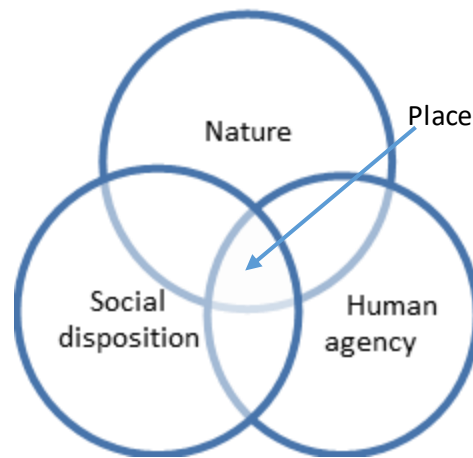
²Theoretical model here refers to both systemic and objective approach of natural sciences and structural theories of social sciences. A theoretical perspective analyses the past and present, allows projection into future, and produces a generalised prospective.

³ The concept life world is advanced by Alfred Schutz, where in a society is understood from the perspective of acting subject. As stated by Schwandt (1997), life world is the world of common sense knowledge of everyday life. A phenomenological understanding of everyday practices gives an understanding that life world is constituted by the thoughts and acts of individual and the social expression of those thought and acts.

Constituents of place

An understanding of place in this dissertation would have three constituents, that is, nature, human agency, and social disposition (see fig 1.1). Nature here is described as natural environment, the setting, and the physicality or i.e. materiality. Materiality of nature, in the context of NRM includes nature of natural resources, i.e., fish, particular fishing sources, and

Fig 1.1 Constituents of place



nature of the Chilika lagoon in the context of this thesis. The concept of nature here is informed with debate social construction, social reproduction of nature and importance of hybridity in understanding nature (Proctor 1998; Boyd et al. 2001; Gerber 1997; Bakker and Bridge 2006). The materiality of everyday practice does not inscribe into the binary of human versus nature, rather is a hybrid of both. The human agency, the second constituent of place, is active and reflexive, and is not a passive actor. The reflexive nature of human agency allows practices to be viewed as a conscious activity that is carried out in specific context, situation, and location. The third constituent, i.e., the social disposition⁴, in this thesis, indicates the relative position of the agent as individuals, social groups, being at a particular place is relative to other beings. Social disposition of a being assign the being a position not only by virtue of their caste, class, eminence and so on but also abilities to draw on various capitals-social, economic, political, cultural, and symbolic. So the practices and relations in everyday context are a product of a numerous interactions among nature,

⁴In this thesis social disposition refers to social status of the agent, which is contextual and relative. The relative and contextual characteristics of social disposition acknowledge active role of human agency. By taking social disposition into consideration, interpretations can overcome rigidity of social structures assumed in social theories. Some of the social structures are recognized as class, gender, caste, and race, and in structural theories human behavior are often attributed to his/her belongingness to these structures. Social disposition, on the other hand refers to the position of the agent in relation to the context, where he/she is situated and the different kinds of capitals, i.e. cultural, social, symbolic and economic he/she is possessed with.

social disposition, and human agency. The dynamics of the three constituents is being termed as place.

Linking structures and everyday practices

Everyday practices are neither a complete product of preexisting structure, nor that of free will. Ever since Pierre Bourdieu, a sociologist, published his works there have been significant efforts to develop a more nuanced understanding of human subject and everyday practices as put forth by him by advancing concepts of 'habitus' and 'field' (see Bourdieu 1972,1979, 1984, 1985, 1987, 1987a, 1989, 1997; Bourdieu and Wacquant 1999). The concept of habitus was initially detailed in Bourdieu's book titled 'Outline of a Theory of Practices', which is a study on Kabylia community in Algeria. In this work, Bourdieu coined the term habitus to explore conditions that shape everyday practices as they are. Bourdieu (1972) details the idea of habitus in the following way: "Habitus is generative principle of practices, which reproduces regulatory immanent for practices; and is necessary to overcome the reductive understanding of objective knowledge and a descriptive account of subjectivism." Habitus in other words is being referred to as a generative principle that mediates between structure and agency and, is unlike determining causality of structural theory. Habitus is explored by investigating everyday practices of life world⁵ unlike a structuralist explanation wherein forces in abstract space are investigated by outsiders. Thus in this way the study of Kabylia community has explored the co-constructive and dynamic relations between existing structure and everyday practices of the community. Bourdieu's concept of habitus has been used by many to delineate human agency in their everyday practices in different fields (see Everett 2002; Holt 1997; Nuijten 2005; Hillier 2002; Parkin 2013; Warde 2004; Ziemer 2011).

⁵ Life world, already described in Foot Note 3 is from a very subjective perspective. However Schutz and Luckmann's description of life-world address the complex way human behavior and practices get shaped and I quote; "The life world understood in its totality as natural and social world, is the arena, as well as what sets the limit, of my and our reciprocal action. In order to actualize our goals, we must master what is present in them and transform them. Accordingly we act and operate not only within the life-world but also upon it. Our bodily movement gears into the life-world and transform its object and their reciprocal relations. At the same times, these objects offer to our action a resistance which we must yield. The life-world is thus a reality, which we modify through our act, and which on the other hand, modifies our actions." (Schutz and Luckmann 1973)

Everyday practices are reflexive

Often everyday experiences are constrained by the immediate environment, both natural and manmade. That is to say, while individuals are navigating their environment on a daily basis, their actions are however not entirely of free will. Rather than viewing the nature and social structure as imposition or constraints, in this thesis, it is argued that there is a dialectical relationship between individuals and their environment. Through interactions, one may find that there is continuous reproduction of relative positions of all the three constitutes. In other words, none of the conditions or structures producing place through habitus is permanent or fixed.

This means how one recognizes/perceives and interacts with natural resources and environment depends on conscious individual's deep knowledge, which in turn is intertwined with cultural, social, and political nature of the individual and the materiality of that place. One is said to be oriented and situated in a place. The dynamics of everyday engagement of human with nature can well be captured through the post-humanist geographer's conception of reflexive understanding. According to Sack (1990), a reflexive understanding addresses the questions of why we do, how we do, and what we do. While the how and what questions posed may provide descriptive answers, yet a reflexive understanding hinges on why of the descriptions or everyday practices. The intent behind in asking the why query is not to determine the 'causal' nature that may be intrinsic to everyday practices, but to identify opportunities for change (see for example, Turner II et. al. 1990; Sack 1990). In the domain of debate on understanding of human-nature relationship, local knowledge and everyday practice are arguably reflexive. For example, Brian Wynne (1996) has shown that the indigenous and local knowledge of shepherds of Cumbria are reflexive by taking account of materiality of their resources and is informed with the specificity and diversity of local situations. Wynne saw local knowledge and practices to be reflexive as it is contextual, unlike that of de-contextualized expert knowledge. In this example given by Wynne, the entire community is taken as a unit, and not an individual. Also, much of the focus has been on peoples' knowledge on materiality and changes therein. In Wynne understanding, like other proponents of community based natural resources management (CBNRM), the local seems to be a community being where no agency is

given to the being/individual. This is in part an argument for reflexive understanding. Wynne argues that expert knowledge is un-reflexive towards its own culturally problematic assumptions, and is an inadequate model of humans and their relations with nature (ibid). Similarly Kalapagam (2014) sees a modern states dependence on statistical narratives, for e.g. to produce modern knowledge, which is nothing but expert knowledge that is unreflexive and facilitates manipulation is to aid/assist powerful interests.

Place, a richer conception than ‘field’

Geographers seem to accept the concept of habitus however; the concept of ‘field’ has not found their favor⁶. Arguing in the same lines, I hold that the concept of ‘field’ does not address role of the materiality of the place where the agents are located and practices are carried out. Place, in view of geographers, constitutes of very many forces and factors, beyond the social ones considered by Bourdieu in the concept of ‘field’. Developments on this strand of understanding on place, i.e. post humanist understanding of place, is being taken into account in this thesis. In Bourdieu’s ‘theory of practice’ field refers to the locus, where agent and social structure are in continuous struggle according to the regularities and rules constitutive of that space. Practices in field evolved from the relation of forces, which aimed at preserving and transforming the existing configuration of forces. However, geographers may say, ‘where’ of the field or location is not explicitly accounted for in Bourdieu’s theorization of field, habitus, and practices.

In this thesis, understanding of place draws on all the three constituents, i.e., nature, human agency, and social disposition. Each of the three constituents is dynamic and relative to other. In other word, all three constituents of place operate and produce meaning in relation to each other. Practices in everyday are product of habitus at a place rather than habitus at a field. While habitus of a field get continuously reproduced

⁶ This is because human subject, in Bourdieu’s conception, is embodied only in social space or what he termed as field. In other words, the idea of field as applied by Bourdieu captures only influence of social and institutional arrangements (Bourdieu 1972). For example, the materiality or physical nature is unaccounted for in the concept of ‘field.’ Therefore the focus of field is narrowed on only social relations/space.

due to the continuous interplay between structure and agents, habitus at a place continuously get produced and reproduced by interplay among three constituents, i.e., nature, human agency, and social disposition. Post-humanist understanding of place draws on dynamic nature of these three constituents and interprets practices in relation to both context and causality, which are both social and natural. An argument is being put forth that understanding habitus at a place needs exploration of relation among nature, human agency, and social disposition in constituting place and practices. As Casey (2001a, 2001b) suggests being is an 'emplaced self', and therefore arguably is embodied with Bourdieu's habitus and embedded on a place.

The term 'place' as understood and opted in this thesis differs from characterization of place in the literature. The thrust of the argument is that a relational view of place is being adopted in this characterization of place. This way the idea that place is given on a natural register is abandoned. The relations of the three elements identified in the framework and their dynamics assist in characterizing the place.

In this thesis dynamic of human-nature relationship in everyday practices is investigated by applying post-humanistic geographer's conception of place.⁷ That is to say, I draw on Sack (1990) who has shown that place emerges as a product of interaction between human agency, structure, and nature. This strand of research on place began during late 1970s and in early 1980s, when geographers were inspired by the work of Anthony Giddens among others and questioned the assumption of free will of human agency and investigate nature of being in place (see Ley 1977; Entrikin 1976, 2001; Gregory 1981; and Sack 1990, 1992). More specifically, continuing this

⁷ The concept of place in geography has been there to understand human behavior from the time of Vidal de la Blache. Relation between place and individual in geography is expressed through metaphors like 'central place', 'place utility', 'sense of place', 'placelessness', 'place attachment', 'place dependence', 'being in the place', and 'emplaced body' (See Curry-Roper 2012; Kyel et al. 2004; Melpas 2001; Tuan 1971, 1974, 1975, 1975a, 1976, 1979; Warnes 1984; Young 2001; Staeheli 2003; Buttimer and Seamon 1980; Massey 2013; Entrikin 1976; 1991, 1999, 2001, 2002; Sack 1992; Jackson 1981; Smith 1981, Buttimer 1976; Mehrhoff 1990). Connotations of place in geography can be broadly fall into three categories i.e. place as location, sense of place, and locale (Johnston et. al. 1986; Agnew 2011). The stand of place as location and locale is more of objective conceptualization of place out there either as a point on the earth or container of things. In contrast to this 'sense of place' explore the subjective account of human relation to its surrounding. Sense of place contributes emotional and affective attributes of place. Being in these discourses travels from a passive agent to a decision making man and from a rational decision makers to an emotional and a calculative person.

strand of research I examine why everyday practices are proceeding in the interactive domain of human, nature, and social disposition. This is because a reflexive understanding comes about when the question of why is posited. This research investigation is to understand reasoning of human as agency in everyday practices recognising that they may change often given the dynamic at a place. This conception of place emphasizes on human-nature relations emerging on everyday time frame that allow our interpretations to address continuously changing characteristics (both spatial and temporal) of place and all the three constituents. This framework place, when applied to DGNR develops a relational understanding of natural resource governance/management issues and practices.

1.3 Research objective:

- To understand the efficacy of ‘place’ for better implementation of DGNR.

To achieve this research objective three questions are pursued in this work.

1.4 Research questions

- How managing natural resources in DGNR is a departure from NRM?
- How state’s understanding of ‘Chilika fishery’ changed between the years 1947 and 2015?
- Why achieving state’s intentions and goals through decentralized governance continue to elude at Chilika fishery?

With DGNR, understanding of nature-society relation is getting concerns with spatial analysis. Transformation of scale i.e. from nation and state to local communities and authorities is vital however, not sufficient enough to address complexities of human-nature relations. Without transformation in assumptions that undergird DGNR, the core of the plan and its approach towards reality remain unchanged and cultural and material richness of nature-society relation remain unaddressed. To realize the full potential of DGNR, from more than a mere transformation in scale of planning, the contextual and situated nature of local relationships with nature and their natural resources is to be explored through the potential of place⁸. In the next section

⁸ The concept of place is not new in DGNR. Conventionally, place in DGNR is an area based or community based conception, which is confined to a location or/and container. Such ontological conceptualization of place establishes dualism of nature vs. culture and object vs. subject. Critiques

I first elaborate on the post-humanistic conception of place, and its potential to bring about a reflexive understanding in the implementations of DGNR.

1.5 Place is reflexive knowledge

The concept of place encapsulates human being and their environment in everyday practices when we draw on Bourdieu's reflexive sociology (Bourdieu 1972) and post humanist conception of place (see Sack 1990; Entrikin 1976; Ley 1977; Jackson 1981). This way, humans are thought of not only to have capacity to produce practices, but also are influenced/shaped by social structures, nature, and such. This frame of thinking is best captured by David Ley when he wrote:

“Each Individual has a history and geography, which impose constraints within his life-world; so begin the dialectic between creativity and determinism; charisma and institution, a dialectic which for geographer become that between man and place” (Ley 1977)

Human are neither considered to be passive in relation to nature nor entirely autonomous in place. Like Bourdieu, post-humanists see everyday practices as a product of second level what David Ley (1977) stated as inter-subjective nature of human experiences and behavior. Next I discuss more extensively on the concept of place applied in this research work.

Reframing place in DGNR

Within the discipline of Geography, the idea of place has changed over time. For my immediate purposes of research work I cast a spotlight on three major departures. There have been continuous efforts in the discipline of geography to understand the dialectic relation between man and its environment since Vidal De La Blache (1926) published *Principle of Human Geography*⁹. Vidal De La Blache saw landscape as intimate amalgam of environment and decision making men. Vidal's interpretive human geography is critical about generalization of human behavior. That is the beginning of possibilism in Geography, which recognized agency of humans. In the

criticize conventional NRM as un-reflexive and reductive nature of scientific knowledge. Similarly, DGNR in practice undermines the very socio-political nature of local experiences, local knowledge, and local institutions.

⁹As cited in Ley (1977); Vidal De La Blache, P. 1926. *Principles of Human Geography*. New York.

first conception, place is thought of as a natural register, a location, and in mathematical terms a geometric space. This Characterisation of place yielded central place theory advanced by Christaller (1933), place utility, which was advanced by Brown and Longbrake (1970), and theoretical ideas of settlement patterns and such. Such locational conception of place is a product of modernity and quantitative spatial revolution in the discipline of geography. Through these developments, there was always a search for a pattern across places. Place as a location resulted in, as Bridge puts it:

“Open an Anglo-American book on economic geography from the pre second world war period you will find its pages studded with reference of climate, soil, energy resources, minerals, water and topography. This regional geography invokes the natural world as a fundamental layer which is alternately a store house of possibilities or a constraint on human behavior.” (Bridge 2014)

He further added that this form of conceptualization reduces nature in to either ‘resources’ or ‘natural stuff’, and understanding of human-nature relationship remains un-dialectical (Bridge 2014). Conception of place as location de-contextualizes and neutralized human nature relationship. Place understanding as location derives its epistemological strands from positivism, which ignores heterogeneity and conflict and tries to represent the world as rational (see Hajer and Versteeg 2005). According to Rodman (1992) when place is conceptualized as a location or a container, ‘place is just space, the dead, the fixed, the un-dialectical, and the immobile.’ This is passive conceptualization of place, i.e., meaning of place is devoid of human agency.

Place as a ‘sense of place’ is second conception that emerged in the 1970s as a critique of place as a location. In early 1970’s geographers however, were reasserting importance of particularities of human-nature relationship. Yu Fu Tuan pioneered the concept of place by taking phenomenological interpretation of the place, who emphasized that people are emotionally and affectively connected to a place. Themes like perception, attitude, and values became parameters to understand man’s relationship with place. For humanistic geographers like Tuan and Anne Buttimer, Husserl’s phenomenology and Heidegger’s concept of ‘being in the world’ were the

philosophical reference points. A phenomenological¹⁰ account of place encompasses subjective dimension of human cognition and intentions (Meherhoff 1990), and are oriented towards phenomenological descriptions, which describe things as they are experienced. Thus a sense of place produces multiple realities and assigns agency to humans and their everyday practices. As stated by Davenport and Anderson (2005) by examining people connection to place these studies capture the subjective and lived experience of people with their environment. Humanists over the years, have captured relation between human and place in terms of 'sense of place', 'public symbol', 'field of care' (Tuan 1971) and 'placelessness' (Relph 1976); and in all these they are arguing for an understanding of place that takes account of sentiments and meaning attached by human in a place.

The third notion of place emerged as a critique of humanist conception of place by drawing on ideas of reflexivity. Reflexivity, as noted earlier, is a particular conception of human behavior. In literature, there is a discussion on both reflexive and un-reflexive conception of human behavior. For instance, un-reflexive nature of state's understanding of nature-society relation is spotlighted in the works of environmental historians (Merchant 1981 and 1990), sociologist of science (Latour 1993), and environmental philosopher (FitzSimmons and Goodman 1998; Goldman and Schurman 2000). Many researchers believed that a reflexive understanding on various conservation and NRM interventions of state will not only expose biasness towards a world view, but will also allow to question, say, the apolitical nature of scientific knowledge¹¹. At this juncture, a few geographers, began to express their worry if 'sense of place' is enough to understand everyday practice (Gregory 1981; Hay 1998). As stated by David Ley (1977) meanings are rarely private, and phenomenological man is unavoidably social, and each post-humanistic conception of place questions the

¹⁰ Phenomenology refers to a philosophical strand that studies the structure of the consciousness as experienced by the first person. Phenomenology strongly came in early 19th century in works of Husserl, Heidegger, and Merleau-Ponty.

¹¹ Foucauldian analysis of power and knowledge for example, see knowledge as a tool to exercise power. There are examples of intentional use of scientific knowledge for the benefit of a particular section of community with power. A reflexive understanding of state interventions and environmental policies is required to reveal the social and political embodiedness of knowledge. A reflexive understanding illuminates the mechanism of interaction between knowledge and power and answer the how question (Hajer and Versteeg 2005).

taken for granted nature of everyday practice and life-world (see Ley 1977; Sack 1990). David Ley (1977) explores inter-subjectivity¹² and Hay (1998) looks for rooted sense of place¹³. Here, as described by Sack (1990), place in the understanding of physical science, social theorist, and humanist per se are insufficient because they tilt towards any one of the constituents, i.e. nature, structure, or human agency. Sack (1990) insists, and I conclude, that all these three constituents of place are dynamic and are to be accounted for (see table 1.1).

According to post-humanists, individuals have a history and geography that mediate among self, body, and place (Casey 2001). Casey uses Bourdieu's concept of habitus and reflexivity to understand being and its everyday practices in his/her immediate surroundings. Entrikin (1991) succinctly posits post humanist conception of place as follows:

“To understand place one requires that we have access to both an objective and a subjective reality. From the de-centered vantage point of the theoretical scientist, place becomes either location or a set of generic relations and thereby loses much of its significance for human action. From the centered viewpoint of the subject, place has meaning only in relation to an individual's or a group's goals and concerns. Place is best viewed from points in between.” (Entrikin 1991)

By following a reflexive insight I investigated human-nature relation in place, as argued by geographers that ‘man should be studied in his habitat and under the condition in which he lives’ (see Park 1967; Ley 1977). Here, Place simultaneously is a factor influencing human behavior and place is an understanding of those behavior and practices.

Thus far I have spotlighted notions of place is already present in DGNR and in NRM approaches. And that the notion of place needs to account for the complications that are “present” in human nature relationship. One strand of work has pointed to reflexive nature of humans interacting with nature and thereby in the

¹² Inter-subjectivity includes the shared nature of experiences of fellow individuals and the situation. David Ley (1977) assigned inter-subjectivity to the historical and geographical condition of individuals that either constraint or facilitate a particular pattern in practices. Inter-subjectivity includes the shared nature of experiences of fellow individuals and the situation.

¹³ Hay (1990) by applying rooted sense of place explored the sense of place developed in various contexts such as home and environment, family, community, and culture.

shaping of place. Recognizing that characterizing place and managing natural resources is changing, this research proceeds within the framework suggested in fig 1.1 in the earlier section.

Proponents of effective DGNR have emphasized on the significance of local institutional arrangements, traditional knowledge and practices, and rules and regulations (see Lobe and Berkes 2004; Olsson et al. 2004; Dewalt 1994; Berkes and Folke 1998; Berkes 2003; Rocheleau 2001; Gadgil et al 1993; Gadgil and Guha 1994). However, recent research studies point to the need for accounting complexities of human-nature relationship at village and community (Naz 2014; Lele and Menon 2014; Baviskar 2007). The complication arises due to, for e.g., rejecting community as an egalitarian institution, man as a complete rational or community being, and so on. To partly address the concerns raised through these research studies, one may draw on the idea of reflexivity. A meshing of the concept of reflexivity and DGNR is best addressed by continuing investigation on the capacity of human agency at a place. Therefore one understands that in a place based DGNR why certain practices of DGNR are like the way they are, and the ‘what’ of both state practices and community practices. As argued by Casey, a reflexive understanding brings about an understanding of relations between man and places with all its complexities (Casey 2001).

In the next few sections of this chapter I discuss in detail all three constituents of place, i.e., nature, human agency, and social disposition.

Nature

The literature is dominated by documenting here are two ways of understanding human-nature relationship. In environmental determinism one sees environment or nature as a source of possibilities and constraint to regulate human behavior. This strand on human-nature relationship draws its assumptions on theories that perceive nature as a causal law shaping human behavior. In opposition to this view, many, especially, social theorists have studied what man has done to the nature by polluting water and air, clearing forest cover, and exploiting mines and ocean. This discourse gives agency to man by emphasizing on the capacity to adapt and reshape the nature for survival of humans. These two understandings of human-nature relationship

restrict the learning either as to what humans do to nature or what are the impacts of nature on man. While these approaches to understand human-nature relations are having very different stand points, they are similar in reducing human to physical or physical to social. Such ontological underpinning of nature that is rooted in environmental modernity, allows conventional NRM and currently in DGNR to see nature as primordial, autonomous, and mechanistic, and places human outside of the nature as resource manager or beneficiary. Resource managers influenced by such strands see nature, economy, and culture as reducible to one another that allow state to have instrumental-technical solution for any environmental and natural resource issues.

Scholars like Blaikie (1985), Smith (2010), White (1986), and Whatmore (2006) denied existence of nature as external to society. They blame conventional NRM for simplifying human-nature relationship by overseeing complexity of society, and specificity of communities (see Peet 1985; Peet and Watts 2002; Walker 2001; Forsyth 2008; Brechin et al. 2002; Homer-Dixon 1994; Schroeder et al. 2006; Kepe 1997; Neumann 1997). They argued specifically for CBNRM¹⁴ as an alternative to conventional NRM. The current trend of DGNR is ideologically guided by such a strand of political ecology and cultural ecology¹⁵.

Further developments like ‘production of nature’ (Smith 2010), ‘second nature’ (Zimmerer 2000), ‘cyborg’ (Haraway 1987) and ‘social nature’ (FitzSimmons 1989) blurs the distinction of nature and society. These researchers have focused on how technological development and social innovation might free people from resource shortage and in turn reduce nature in to social. Such studies reveal how culture, more specifically capital, is a hegemonic partner in human-nature relationship. This finding

¹⁴Community Based Natural Resource Management (CBNRM) is based on the idea that resource use and management can be achieved at community level. This stand on natural resource management believes that traditional/indigenous communities, the values they attribute to natural resources, and environment, their community institutions and practices are more adaptive and efficient to sustainable manage natural resources (Adger 2000; Allison and Ellis 2001; Brown 2013; Johannes 2002).

¹⁵ In-addition to these two there are numerous efforts to overcome dualism in understanding of human-nature relationship. Some of these strands are ecosystem, ecological economics (Costanza et. al. 1997), human ecology (Barrow 1923), political ecology, environmental sociology, and ecosocialism (Kovel 2011). They reject dualism of nature vs. society. (also see Ross 1999; Iorres 2000, 2013; Bennett 1976; Whyte 1986; Whatmore and Boucher 1993; Cosgrove 1983; Peil 2014; Smith 2010; Castree 2001)

is in addition to how these discourses have emphasized on structures like class, caste, and gender in reproducing human-nature relationship.

In a way they replicate the desire for a generalized explanation by ignoring specificity and heterogeneity within these structures. Both the strands on human-nature relationship in one way or the other simplify nature or society, by giving importance to one of them. Implication of such simplified model is well articulated by Sack (1990), when he wrote, ‘these vagaries are magnified when simplified models of human behavior linked to simplified models of natural system to create instrument of analyses’. Post humanists in their conception see nature as one of the constituents of place, in contrast to nature as causality in environmental determinism, and that of nature as a neutral and passive agent in social theorists and humanists. Post humanist understanding of nature as a constituent of place, as argued by Sack (1990) has to be understood in relation to other two, i.e., structure and human agency. Such strands on conceptualizing nature is explored in works of FitzSimmons (1989), Gerber (1997), Proctor (1998), Delaney (2001), and Demeritt (2001, 2002, 2009). They reject the dualism of nature and culture and see the social world is as much created by materiality as the other way around. The post-humanist concept of place employs the concept of embodiment as a way of capturing the physically enframed nature of being and practices.

The conceptualization of nature in this thesis draws its inspiration from concept like hybridity (Latour 1993), conjoint materiality (Demeritt 1998), and Conjoint Constitutions (see Fruedenburg et al. 1995), which reject dualism of ‘pure nature’ and ‘pure society’. These studies on material culture investigate how properties and meanings emerge from the interaction between materiality and subject rather being product of any one of these (see Bakker and Bridge 2006). Casey’s concept of ‘emplaced self’ gives body an indispensable role in mediating between place and self. The materiality, that is, bio-physical constituents of place, plays an important role to confer kind of fixity to it. For instance, place needs boundary to make sense in terms of inside and outside, even if they are porous and not so closed. For example, places, communities, and fishery practices in Chilika fishery, as we will discuss in this thesis are shaping as well as getting shaped by the materiality of Chilika fishery. That is to say

place is determined by hydrology of the lake, physical nature of fishery sources, nature of fish; and also by distribution of infrastructural developments like transport, storage, and market (For additional examples see Raffels 2007; Scott 2009; Pickering 1993; Lahiri-Dutt and Samanta 2013).

Anthropogenic factors not only have changed the physicality/materiality of natural phenomena and their impact on human, the socio-cultural meanings of nature and environment has been repeatedly subject to change (Frudentburg et.al. 1995). Understanding of human-nature relation required an in-depth insight to how these sociological or/and cultural meanings have evolved.

Human agency

According to David Ley (1977) meanings are rarely private, and phenomenological man is unavoidably social, and each individual has a history and geography, which impose constrained on its practices. This idea is detailed in this section and is being applied in the conception of place suggested for DGNR. The concept of place sees humans as active and reflexive; rather than as passive agents in both physical sciences and social theories. By drawing further on Casey, to exist one has to be placed, and for humanist and post-humanist geographers complexity of human behavior can only be understood in its place, in the life-world (Casey 1997; Lay 1976; Entrikin 1976, 1977, 1991). To this end, Casey has used Bourdieu's concept of habitus to understand social embodiedness of being (Casey 2001, 2001a). The argument is that there is a need to understand humans in his/her habitat under the condition in which he/she lives (Park 1967). Post-humanists see the embodied and emplaced nature of being as essential condition for human existence. Entrikin (2001) however, in his 'hiding place' advances ideas proposed by Casey by arguing that discussing habitus is not enough to understand nature of a 'emplaced self'. In other words, the concept of place in 'emplaced self' should not be confined to location (Entrikin 2001). We arrived at this idea of place by displacing two earlier notion of place. I state them briefly in the next paragraph.

In literature scholars have notes that state sees the only way to address issues like pollution and resource exploitations is through outside intervention, either as rule

of the state or/and market competition (Silva et al. 2009; Endter-wada 1998).¹⁶ In recent times social theorists complexify these simplistic models of human-nature relation by bringing role of structural heterogeneity in determining human-nature relationship. Such strands however, continue dualism of human versus nature because there is a relative absence of human agency, which is either guided by environmental constraints or by social structures.

A phenomenological interpretivism ascribes agency to human. They refuse deterministic strand of ecology and social theories, and argue that human behavior in everyday practices are guided by context rather than structure. For instance, for Tuan (1971) humans in everyday practices are guided by their senses and experiences. Such cultural constructions, i.e. sense of place, topophilia, and placelessness are constructed through language, narratives, and emotion. This strand explores humanly authored worlds (Smith 1981). When this conception of place is applied to NRM, emphasis is given to emotional and affective aspects of human-nature relationship (see Cheng et al. 2003; Eden and Bear 2011; Duruz 2002). The accounts are often descriptions of how humans interact with nature. Such an understanding of humanist conception of place posits a transparent, autonomous, and masculine subject, which ignores role of existing structure in shaping the multiple realities that humanists are looking for. Guided by humanism understandings of a place based human-nature relationship get restricted to describe 'how' of everyday practices. Humanists abstracted from lived history and geographical embeddedness (Nelson 1999). For example in studies of CBNRM (Berkes 2003; Berkes and Folke 1998; Berkes et al. 2001; Beck and Nesmith 2001; Baland and Platteau 1996; Armitage 2005; Rocheleau 2001), human in humanism, like their counterpart in structuralism and ecological explanation, remains un-reflexive, which follows all community practices blindly. These ideas on place are dominant in

¹⁶ NRM influenced by ecological and economic approach perceives human either as stressor or manager. NRM guided by ecological approach see preservation as solution for environment and natural resource issue. Being inspired by 'Foraging Theory', and 'Stock-Recruitment Model' it advocate state to restrict accessibility and increase control of the state (Alvard 1994). Economic approach on the other hand looks for the optimal economic structure for satisfying wants and allocating resources most efficiently. Natural Resource Managers guided by classical and neo-classical economic approaches aim to maximize yield and for efficient allocation of resources by following welfare economic framework (see Emel and Peet 1989), maximum sustainable yield (see Pigou 1962), Pareto optimality (see Emel and Peet 1989), Coase theorem (see Coase 1959 and 1960).

literature and in practices. However, significant omission can be addressed by a third idea on place.

A reflexive understanding of ‘experiential knowledge’ and ‘everyday practices’ ask why community practices are how they are. Therefore there is an investigation of the rootedness of individual in local history and geography. Post-humanists give importance to human agency and emphasizes on understanding the everyday engagement of local community with the resources at stake, which is both calculative and moral and is very much guided by their social disposition, context, and situation. In DGNR there is a promise of participation by locals, as a political and pragmatic solution for various conservation issues (Zimmerer 2006; Springer 2009; Bryant 1997; Cocklin et al. 1998). Communities in DGNR are characterized by voluntary membership, shared resources, and some form of separation from broader society. In DGNR individuals are treated as a representing the community. In current trend of DGNR in India, immense confidence has been put on the community, which is assumed to be egalitarian in its nature. Recently many micro level studies (Nuijten 2005; Naz 2014; Medin et al. 2007) reject the unified notion of community and recognize role internal differences in affecting human-nature relation at community level. The assumption of a homogenous and egalitarian view of ‘community’ overlooks roles of power and politics (Mehta 1999). Society-nature relations emerge, consolidate and recede through processes of legitimization, inclusion, exclusion, and resistance, which are to be inquired at the community level in place based DGNR. Conception of individual as community-being restricts self-reflexive nature of individuals. A place informed DGNR replaces the rational economic man, by a self that is embodied with values of community and at the same time with individual interest. Post-humanists argue that to explore such complex nature of human agency, one has to investigate practice at place rather force in space.

A post humanistic conception of place facilitate understanding human behavior that in DGNR that goes beyond both the extreme position of Hardin’s pessimistic generalization of human behavior, and CBNRM’s optimistic understanding of human-nature relationship.

Social disposition

Reframing place in DGNR, brings a different ontological orientation towards nature of man and its experiences. As described in the previous section, human agency does not exist apart from the nature, as well from the social context. In post humanistic conception of place, the focus is on practices and recognizing that nature of human agency is not of free will.

Post humanist geographers draw their theoretical understanding from Giddens's structuration theory, which unfolds interaction between agency and structure in locales. Social contexts are given importance, but not attributed with causality as in social theories. A non-deterministic attribution to social context allows recognition of the role of human agency in transforming existing institutions. Without the role of structure post humanist include diverse social relations. This thesis goes with Bourdieu's concept of social disposition to acknowledge the transformative capacity of human agency by avoiding determinism of social forces. Such conception of context and social relation facilitates a continuous reconstructed explanation of everyday geography. Gregory (1981) recognizes importance of history in constructing everyday practices, and notes that:

“History can't be predetermined and human agency can't be evicted from historical process.” (Gregory 1981)

Everyday practices may be routinized or otherwise, but a reflexive understanding of everyday practices equips us with an understanding of interaction between social forces, dynamics of nature, and human agency. The notion of intersubjectivity acknowledges the recurrent and recursive relations between individual and society for production and reproduction of both social life and social structure (see Ley 1977; Gregory 1981).

Social disposition of being is a function of four kinds of capital that he/she possesses (Bourdieu 1972). These four capitals are: economic capital, social capital, cultural capital, and symbolic capital. All four forms of capital are either singularly or in combination influence the process of resistance and dominance. Social disposition

in a place affects the relative social position of being in the place and his/her experiences and nature.

Literature on nature-society relations, especially on NRM in post 1980s, is rich with explanations of why there is a pattern of distribution of natural resource or how natural resources are being used. For example, socialist approach to NRM assumes heterogeneous stakeholders are possessing different power relations and interests, thereby influencing who gets what (Mehta et al. 2001; Mehta 2011; Forsyth 2008). Similarly, cultural ecologists through their focus on community's everyday engagement with natural resources criticize NRM for its generalized nature of understanding. Cultural ecology however remains blind towards intra-community dynamics, and puts community and community members in isolation from rest of the world. DGNR at ground derive its central principles from structural understanding of political ecology and subjective understanding of cultural ecology. In DGNR one acknowledges particularity of village and community, but what count often is a homogeneous nature of community and village. Everyday engagements in cultural ecology are regulated by traditional institutional arrangements. But community everyday engagements can be very subjective, moral, and apolitical.

In this thesis therefore a reframing of place in DGNR is put forth with a belief that it provides a framework by uncovering layers of experience by individuals. In DGNR, one is to account contradictions and address fragmented and multifaceted nature of human experiences. By reframing Place in DGNR, the thesis has examined DGNR to be place based, rather than a community or location based. A place based DGNR will allow exploration of environmental and natural resource issues through everyday practices, and through the experiences of insiders. By reframing the concept of place in DGNR, one recognizes the situatedness of practices and knowledge. By taking in to account the dynamics of all the three constituents of place, one is able to eliminate the dichotomy between fragmented human subject of structuralist and unified humanistic subject.

Beings and their practices in a place draws equally on all the three constituents of place i.e. nature, social disposition, and human agency. Unlike the current trend of

transformation from conventional NRM to DGNR, a place informed DGNR demand a relook into the ontology of the understanding of these three constituents and the way they interact. In the production and reproduction of practices and place 'nature', 'social disposition' interact in relation to each other. A place based interpretation of practices are reflexive that reject the binary of seemingly contradictory concepts, such as nature versus culture, rational being versus community being, and agency versus structure. It recognizes role of context and time. Such interpretations of human-nature relationship see human as reflexive being and has scope to address contradictions and complexity. A place informed DGNR recognizes plurality of experience and values assigned to natural resources (see table 1.1).

1.6 Introducing Chilika fishery

Chilika is the largest brackish lagoon of Asia situated in the eastern coast of Odisha (Fig 1.2). Fishery at Chilika is a source of livelihood for 103454 fishing population in 141 fishing village. Biophysical nature of Chilika fishery is very much product of the stem of inflow and outflow of water from its fifty two rivulets and Bay of Bengal. The fishing practices of the lake, traditionally is regulated by caste based institutions, i.e. *gramasabha* and *desh*. Chilika fishery is subject to many dynamics both internal and external. Internal dynamics include gradual demise of caste based fishing practices, weakening regulating power of *desh* and *gramasabha* over fishing sources and fishing practices, changing nature of fishing sources. External factors affecting fishing practices includes neoliberalisation and blue revolution of 1980s and global web of ecological concern for wetland management i.e., recognition of Chilika as wetland of international importance by Ramsar Conventions.

Previously the lagoon used to be possessed by local *jamindars* under princely state, and traditional fishing community were used to have right to use and manage their community fishery sources by paying tax. The lagoon came under the possession of the state with independence, and state has taken many initiatives from time to time to regulate Chilika fishery. State initiatives to regulate fishing practice of the lagoon include; reorganizations of fishing rights, introducing new technology and new practices, ecological interventions, and reforming institutional and organizational

arrangements. There is documentation of failure and negative implication of state's initiatives on the fishery of the lagoon. Some of those are, monopolization of the regional economy, incursion of non-traditional users (Pattanaik 2006), increasing inequality, marginalization of poor and traditional fishers (Nayak and Berkes 2010), encroachment (Mishra and Griffin 2010), and weakening and abolition of traditional fishing law and regulation of the lagoon are recorded (Samal 2002, 2007; Samal and Mehar 2003). Existing literature sees inappropriate state interventions and existing economic inequality as major reasons for failure of fishery policies at the lagoon. Gradually these perspectives have become part of the state's fishery management strategy at the lagoon. For instance initiatives to uplift the economic standard of fishers by providing subsidizing loan and other fishing capital such as boat, net, and motor; setting up PFCS to eliminate commission agents, reforming PFCS as CBOs, and conducting awareness programs. Recently like in other sectors of natural resources, DGNR is promoted in Chilika fishery through various initiatives, most importantly the establishment of CDA and PFCS.

In 1991 CDA was established with objective of ecological restoration and conservation of the lagoon. PFCSs in Chilika fishery were formed since 1942 however, recently they are recognized as CBO to manage community fishery sources of the lagoon. After opening of new mouth and removal of the lagoon from Montreaux record of Ramasar convention, Chilika is often presented as a model for wetland management by state, centre and international organizations. CDA often organizes training camps for wetland managers of the country at Chilika to learn about sustainable management of wetlands¹⁷. In this context this thesis investigates how DGNR is working at Chilika fishery by asking a why question to state's interventions and to the working of units of DGNR, i.e. CDA, PFCS, and *gramasabha*.

This thesis puts a reflexive gaze on implementation of DGNR at Chilika fishery in reference to state's interventions and community fishing practices. This

¹⁷Piyush, Dipankara. 2016. Odisha Chilika lagoon turned out to be Gurukul for 26 Ramasar sites managers from across India. Downloaded from <http://www.orissadiary.com/CurrentNews.asp?id=64504#sthash.K4md82pW.dpuf> on 15th February 2016.

investigation is in reference to two major decisions in the history of Chilika fishery, i.e., Opening of the new mouth and state's attempts for revival of PFCS.

1.7 Methodology and methods of data collection

My investigation at Chilika fishery was guided by extended case method (ECM) of ethnography. My field work for understanding of state perspective includes archival research, informal interviews, observations, and group discussion. Documents of various state's intervention to Chilika fishery were discursively analyzed. Interviews with official and analysis of the nature of the organization involved in such policy helped to complement my textual analysis. To understand place and 'emplaced self' ethnography was carried out at fishing villages of the lagoon.

For community perspective 17 Focus Group Discussion (FGD) were conducted in different fishing village around the lake. Villages were selected through snowball sampling from each ecological zone and different sub-caste of fishing community of the lagoon. For in-depth understanding ethnography was carried out in four fishing village i.e. Mainsha, Berhampur, Gola and Arakuda of Puri district. Unstructured and open-ended interviews, group discussion and field observation are the major tool of data collection. The detail account of methodology and techniques and tools of data collection will be discussed in the second chapter.

1.8 Layout of dissertation

Chapter 1: The idea of place in Decentralized Governance of Natural Resources

Chapter 1 introduces the dissertation by stating need for ontological reformulation in the understanding of nature-society relation for improving current trend DGNR. It theoretically explores potentiality of the concept 'place' for a better inform agenda for DGNR. Then the chapter proceeds with a brief description to its objectives and inscribe research questions around which the work evolve. Subsequently a discussion is made on how reframing place in DGNR allow to understand nature, human, and society in a more effective way. Bourdieu's concept of habitus, reflexivity, social

disposition, Casey's concept of emplaced self are employed to reframe place in DGNR. It includes a brief introduction to Chilika fishery as a case to understand the trend of DGNR in India. After briefing of methodology and methods used for data collection the chapter is concluded with a layout of the dissertation.

Chapter 2: Extended case method for a reflexive ethnography of Chilika fishery

Doing ethnography through Extended Case Method (ECM) has rich narratives on practices conducted both by the state and fishing communities at Chilika fishery. The description given by respondents and observations resulted in an understanding of how both state and community practices emerged over time. A dialectic between my theoretical understanding and empirical observations lay the basis for this understanding. Applying ECM facilitated the probe into raising the why question to practices, both of state and local. A discursive analysis of policy documents resulted in them being beyond source of information to being raw material to reflect up on the nature of knowledge produced and nature of resources invested in the production of such knowledge. The chapter includes a brief description of field sites, sources of information, and techniques adopted for collection of data and their interpretation. Besides discussing refinements that have been made as the research progressed, I conclude the chapter by discussing strength and limitations of methods applied in this research work.

Chapter 3: State's understanding of Decentralized Governance of Natural Resources

Chapter 3 is a review primarily of natural resource management policies in India to assess state's understanding of DGNR. A discursive analysis of the idea of DGNR in different sectors of NRM in India is also carried out. This allows a critical reflection of how at the scale of operation, i.e., place, local, village and community is conceptualized and thereby cast a spotlight on assumptions intrinsic to DGNR and potential reasons for failure of DGNR at micro level.

Chapter 4: An analysis of state's interventions in Chilika fishery, 1959-2015.

A chronological investigation is made, more specifically a socio-ecological history of Chilika Fishery to reflect on the evolution of fishery policies. Further community perception about various fishery policies and issues of Chilika fishery was gathered from seventeen focus group discussion carried out in and around the lagoon. A need for an alternative and complex understanding of issues is established in the chapter 4.

Chapter 5: A reflexive understanding of state's interventions: DGNR and dominance of scientific knowledge

Among many state initiatives, the chapter five specifically focuses on understanding the nature of decision made for opening of new mouth by CDA. New mouth was opened by CDA in 1999 to address many ecological issues of the lagoon. As per government records, opening of new mouth has restored the ecology of the lagoon, which in turn has contributed in the increase of quantity of fish landing. The fishing communities, in and around the lagoon however, reported during interviews and interactions that there is a continuous decline in their fish catch, especially for fishing communities in outer channel, which were projected to get maximum benefit from the opening of new mouth. In this chapter I discuss these contrasting claims. I conclude that there is mismatch on the assumptions and evidences that is relied upon by the state and fishing communities. Agencies that are involved on behalf of the state produce knowledge and decision that is dominated by scientific knowledge. Fishers, on the other hand, seem to concern and account for complex socio-cultural relations among communities, their fishing practices, and nature of fishery sources.

Chapter 6: Understanding fishery practices

State starting from 1950 has taken many initiatives to reorganize the fishing community and regulate fishing practices. Introduction of cooperative movement is a major intervention among many. At present context when *gramasabha* and its regulatory majors seems to be weakened, state focus on revitalizing community's collective action through by reorganizing fishers through PFCS. A bird view of Chilika fishery however

reveals failure of PFCS as CBO to govern fishery sources of the lagoon and *gramasabha* still continue to manage the resource though it has lost its control over fishery sources and fishing practices. Chapter 6 investigates why PFCS and also *gramasabha* are unsuccessful in regulating various unsustainable fishing practices at the lagoon.

Chapter 7: A place based critique of Decentralized Governance of Natural Resources

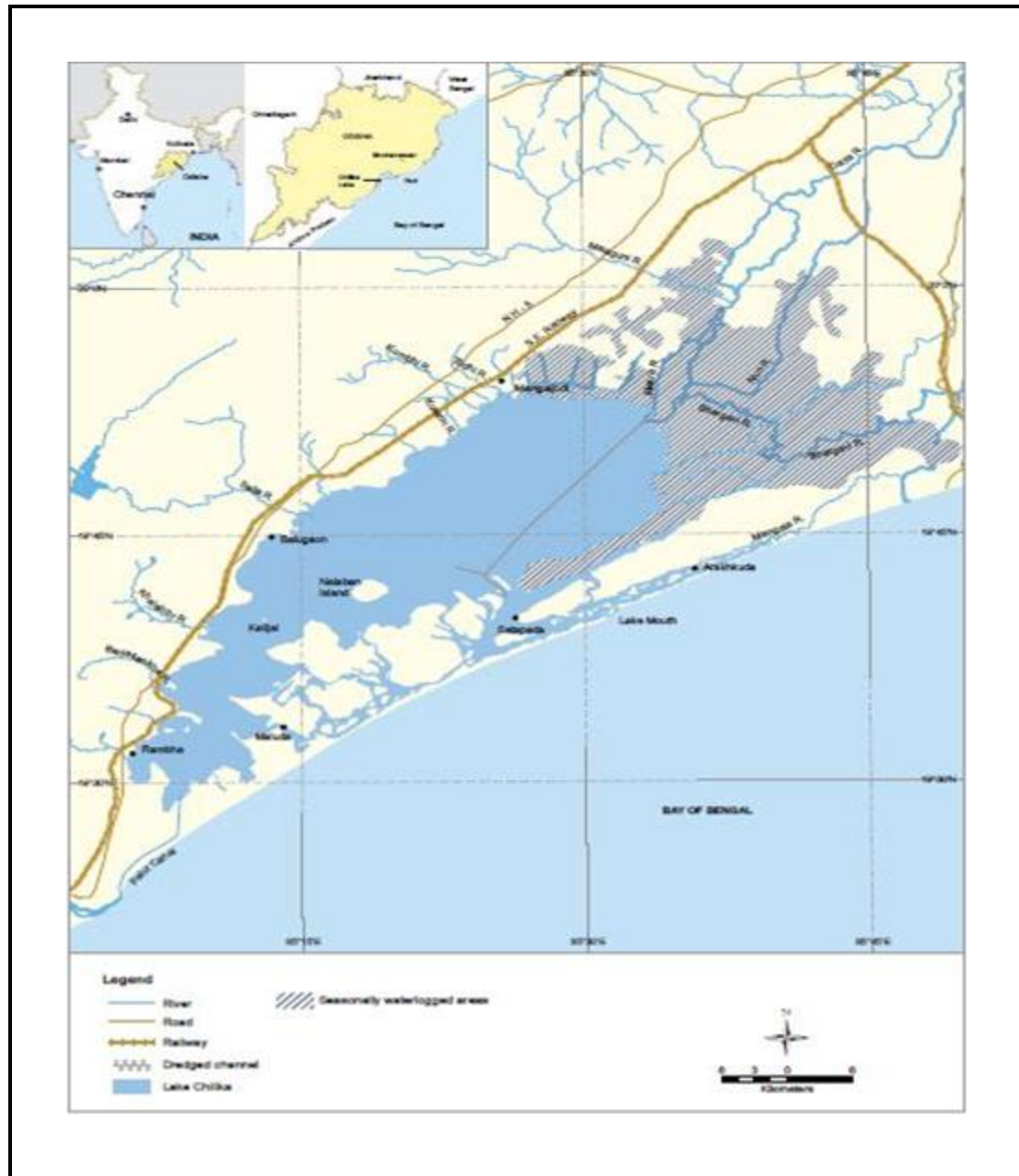
This chapter summarizes findings from all the six chapters. It concludes that the current trend of DGNR and the way it conceptualize nature and human and their relation is an improvement over conventional NRM but not sufficient enough. DGNR in Chilika fishery seems to be more of a transformation confined to scale, and mere organizational rearrangement, without any substantial change in assumption that undergird many state initiatives. The thesis find state in general and in special reference to Chilika fishery is biased towards technocratic solutions and is un-reflexive towards its own assumptions. DGNR to be reflexive in its understanding the unit of decentralization need to be placed rather than in a location or community. Place in DGNR need to be a constituent of human agency, social disposition, and nature as conceptualized by post-humanist geographers. The Chapter concluded with a brief discussion of the limitations of the study, concluding remarks and scope for future investigation.

The chapters, together advance the idea of place based decentralized governance of natural resources. Much of the literature has documented failures and potential pitfalls to avoid while implementing decentralize governance. In this thesis the attempt is to overcome some of the limitations of weak implementation of decentralization by suggesting a framework and its application of Chilika Fishery. I begin the next chapter by detailing the method applied in this research work.

Table 1.1: Ontology of constituents of ‘place’ in NRM, DGNR, and Place informed DGNR

Constituents of Place	Place informed DGNR	Current trend of DGNR	Conventional NRM
Nature	Hybrid of social and cultural Value assigned by being	As a storehouse of possibility and constraint Value assigned by the community and local institution	Nature as Resources Wild and in isolation from human
Human Agency	As emplaced body A reflexive being	As community being Un-reflexive and passive	Individual As a Rational Being
Social Disposition	Social position of the individual, in relation to the community he/she lives on and to the context	Determining influence of structure, such as caste, class, and gender.	It was not considered to construct simple model of human-nature relation

Fig 1.2 Location map of Chilika



Source: CDA 2012a

Chapter 2

Extended Case Method for a Reflexive Ethnography¹⁸ of Chilika Fishery

2.1 Introduction: DGNR and need of reflexive understanding of nature-society relation

In DGNR one seeks meaningful participation and incorporation of local knowledge and values (Larson and Soto 2008). As discussed in the first chapter, in this thesis an argument for further reformulation of DGNR by incorporating a reflexive understanding of human-nature relation into DGNR is put forth. That is to say, a reflexive understanding of DGNR is to be place-based, which means capturing life world of human-nature relationship is to be reworked¹⁹. A support for this position comes from literature in anthropology and in sociology of science that critically reflects on DGNR (Agrawal 1995, 2005). This body of work has found science is dominant in conceptualizing various environmental/ natural resources issues, and in policy advocacy. The studies have also pointed out that environmental policies are being shaped by a particular discourse that leads to bias in conceptualizing the policy problem at hand, as well as in solutions that can be conceived for those problems (Goldman and Schurman 2000; Ganguly 2016). A Foucauldian analysis, for example, sees knowledge as a tool to exercise power. While these insights are helpful, however, many found (de Souza 2010; Garcia-Guadilla 2002; Kellert et al. 2000) implementation of DGNR is far from achieving the full potential.

Redefining Place in DGNR, as proposed in this thesis allows visualizing practices in forms of both resistance and accommodation. A detailed or thick description possible only by reflecting on the life world of people, i.e., place. This research has chosen reflexive ethnography as research methodology for a detailed analysis of community engagement with natural resources.

¹⁸ Charlotte A. Davis wrote a book titled as Reflexive Ethnography published by Routledge in 1999.

¹⁹ Existing understanding, here include ecological and economic approach of conventional NRM, political ecological approach of environmental movements and social justice movement, and the cultural ecology and socio-ecological understanding of DGNR (Dewalt 1994; Adeson 1975; Berkes and Folke 1998; Gadgil et al 1993, 2000; Gadgil and Guha 1994).

Traditionally, ethnography produces a description of the field, however has been criticized as unsystematic and atheoretical. In other words, in ethnography, there is a need for linking theory and fieldwork²⁰. In response, two different strands, ‘grounded theory’ (GT)²¹ and ‘Extended Case Method’ (ECM) have been advanced. The extended Case Method is advanced by Michael Burawoy through his work on *Zambian Copper Industry*. According to Burawoy:

“The extended case method (ECM) applies reflexive science²² to ethnography in order to extract the general from the unique, to move from the “micro” to the “macro,” and to connect the present to the past in anticipation of the future, all by building on a preexisting theory.” (Burawoy 1972)

Burawoy advises ethnographers to focus on extended observation of a relatively local situation. He argues that any adequate description of social life must be informed by historical, social, political, and economic dynamics that originate beyond the space of the field site. Therefore, the extended case method is defined by its four extensions, which are:

“..the extension of observer into the lives of participant under study; the extension of observation over time and space; the extension from micro processes to macro forces; and finally and most important, the extension of theory” (Burawoy 2009)

ECM is explained by Tavory and Timmermans as follow:

“ECM produces a theoretically driven ethnography or what can be called ‘theorygraphy’ in which research activities aim to modify,

²⁰ Both Grounded theory (GT) and Extended Case Method (ECM) employ ethnography. In GT theory is constructed from within, from narratives of agents involved, and lived experience of the world (Glaser and Strauss 1967). Whereas in the case of ECM, theory is the starting point.

²¹ Grounded Theory (GT) is proposed by Glaser and Strauss (1967) in response to marginalization of ethnography as a systematic description. In their work they argued that sociologists built their ‘theory from ground up’. In GT one has to use inductive codification of data, constantly verifying and modifying concept from emerging data (Tavory and Timmerman 2009).

²² In opposition to the principle of positivism and naturalism, which seek for isolation of researcher from the data gathered by him or her ‘by turning him or her either in one case, into an automaton or, in the other, into a neutral vessel of cultural experiences.’ The concepts of reflexivity acknowledge that the orientation of researcher will be shaped by their socio-historical locations, including the value and interest that these locations confer up on them. It rejects the idea that social research is, or can be, carried out in some autonomous realm that is insulated from the wider society and from the biography of the researcher, in such a way that the finding can be unaffected by social processes and personal characteristics. (Hammersley and Atkinson 2007).

exemplify, and develop existing theories.” (Tavory and Timmermans 2009)

In this thesis, I capture everyday experience of fishers, their tacit knowledge, and fishing practices by going beyond mere description of the field site. This is through a reflexive understanding. That is to say, there is a need to ‘reflect adequately’ on the situatedness of the practice and knowledge (Burawoy 2003). As stated by Kogler:

“Agents can only become truly autonomous by realizing the amount of non-autonomy in themselves, that is by acknowledging the impact of non-reason of the other of conscious self-reflection in their explicit self-understanding.” (Kogler 1997)

Therefore through ECM I propose to capture a reflexive understanding of fishery practices at the lagoon, by extending observation on nature of the community and their relation to fishery in terms of cultural and economic dynamics, and materiality of the lagoon and its fish.

2.2 ECM and Chilika Fishery

At Chilika Fishery, I learned from preliminary investigation and literature that the state is intervening actively. Therefore, an analysis of policy documents discursively, along with observations on the working of agencies involved, and interviews constitutes data to assess state’s intervention in the form of DGNR in Chilika fishery. This part of my field work consisted of Focus Group Discussions (FGD) in fishing villages that are in and around the lagoon, extensive participatory observation over four fishing villages. My observations at the field sites were complemented with research in archives available at State Archives of Odisha, and literature available at various libraries, which include State Library of Odisha, Library of Legislative Assembly of Odisha, Library of Nabakrihna Chaudhury Centre for Development Studies (NCCDS, and Library of CDA. Documents available with communities were also accessed and enriched the interpretation. I find that state has intervened in many ways, such as dredging of the channel, regulating siltation and salinity of the lagoon, opening of a new artificial mouth, introduction of cooperative movement, promoting and latter banning of aquaculture, redistributing fishing rights, and so on over the past six decades. However, emphasis of this research study is on two initiatives, i.e., opening of new mouth in 1999 and effort to revitalize Primary Fishing Cooperative Societies (PFCS)

as Community Based Organization (CBO) to manage the fishery in the lake in post 2010 years. The decision of opening of new mouth was predominantly taken by CDA, which is an autonomous body of the state government, specially constituted to look after conservation issues of the lagoon. PFCS, though has a longer history in Chilika fishery, has evolved as a CBO for sustainable management of Chilika Fishery. I detailed in paragraph below the two interventions by state.

Opening of a new mouth in the lagoon

A mouth was opened by CDA at Shipakuda in 2000, which is a hydrological intervention to restore the system of influx and efflux of water and silt, to and from the lagoon. Opening of the new mouth and subsequent dredging of the channel have restored natural recruitment of fish stock of the lagoon from the sea. Official records show an increase in the quantity of fish landing from the lagoon, which in turn gives a boost to economic development (Panda and Mohanty 2005; Balchandran and Rahmani 2005; CDA, 2008, 2010, 2011, 2012, 2013b, 2013c). It is claimed that, after the opening of the new mouth average annual incomes of fishers got raised five folds. However, Integrated Coastal Zone Management (ICZM) project reports reveals that average annual income for fishing family in Chilika are found to be hover around Rs. 52000/- in 2003-04, which found to be in declining trend. Other research studies support this finding (see Dujovny 2009). The positive impact on the life of fishing communities through hydrological intervention is less than anticipated. I therefore, examined why the opening of the new mouth failed to bring any positive change in the quantity of catch of fishers, despite ecological restoration of the lagoon.

Revitalizing Primary Fishing Cooperative Societies (PFCSs)

Cooperative movement was started in Chilika around 1922, PFCS were formed in 1942, and in 1959, a two tier system of cooperative structure was established for managing Chilika fishery. The basic objective was to replace feudal system by introducing new leasing practices. However, the cooperative movement in Chilika fishery rarely succeed in eradicating dominance of commission agents in Chilika fishery and did not evolve as a grass root organization to manage fishery of the lagoon. Immense efforts have been put forth by the state for revitalizing the cooperatives in

Chilika fishery. State had formally replaced traditional community organization, i.e., *gramasabha* with PFCS. PFCS are vested with the right to take the lease and manage their respective fishery sources. Post the year 2010, PFCS were provided with subsidized financial assistance for raising working capital for their members. Similarly, state distributed boats, nets, and motors at subsidized prices to support fishers, in order to get rid of commission agents. CDA in collaboration with NETFISH²³ has conducted programs to create awareness regarding wise use of fishery sources and on workings of PFCS. State is also continuously experimenting with the organizational structure of cooperatives to improve their functioning.

PFCSs in Chilika fishery exists since 1942 and their number by 2015 had reached to 140. However, in 2015 there are only two PFCS, PFCS of Maninsha and PFCS of Santinagar Refugee Colony, which are actively functioning and marketing their fish catch. PFCS as an alternative to traditional community organization seems to be a failure. All state subsidized welfare schemes are getting appropriated by few, predominantly leaders of PFCS, and PFCS exists only as a legal requirement without effective practical functions.

Chilika Fishery, like many other cases of DGNR in India, offers an opportunity to understand the decentralized systems of governance. A discursive analysis of environmental and conservation policies is required therefore to reveal the social and political embodiedness of knowledge in practice, and to illuminate mechanisms and answer 'how questions' (Hajer and Versteeg 2005; Nandy 1993).

2.3 Discursive analysis of state's intervention in Chilika fishery

My understanding of Chilika fishery began with a reading of secondary literature, a large number of government documents, Non Government Organization (NGO) reports, and newspaper clippings. These sources are either in Odia or English language, and provide a description of ecological, historical, social, and economic

²³NETFISH is also known as Network for Fish Quality Management and Sustainable Fishing. It is a society registered under Marine Products Export Development Authority (MPEDA), Ministry of Commerce and Industry, Government of India. The society works for imparting knowledge to fisherman and fisherwomen and processing workers.

setting of Chilika. Institutional arrangements, both state initiated and traditional arrangement ones, are documented at state, regional, and local levels. Numerous documents prepared by fishing communities were also accessible to me. These include records of *gramasabha*, records of PFCs, and various legal documents, and local stories (both documented and oral).

Additionally, to understand state's perspective I relied on project reports, legal documents, information available from organizations relating to Chilika, such as CDA, Department of Fishery Odisha, Assistant Registrar of Cooperative Societies (ARCS, Chilika) office, and Deputy Forest Officer (DFO, Chilika) office.

Documents were analyzed discursively to understand what kind of knowledge was applied to generate these documents. Discursive analysis refers to the qualitative inquiry that acknowledges that the language in practice is in part constitutive of its meaning. This inquiry proceeded with the belief that the meaning of practices is the reflection of intention of practitioner, which is socially, historically, and politically constructed (Schwandt 1997). A discursive analysis²⁴ of policy document is in addition to investigating organizational structure and profile of people occupying the positions, and resources engaged in such knowledge production, i.e. nature of collaborative and funding agencies.

Personal interviews with officials were carried out to complement and to verify information gathered from the analysis of various reports. Interviews with officials were unstructured and open ended. Interviewees include officials in CDA (Chief executive officer, scientific officers, and researchers), 2 Assistant Registrar of Cooperative Societies (ARCS) Balugaon²⁵, DFO of Chilika circle, and Managing Director and Inspector in Charge of FISHFED.

Besides these data gathering and analysis, I observed the working of government offices, which includes conflict resolution meeting²⁶, awareness

²⁴Discursive analysis is a method of analysing writing and speech. It is used to analyse the nature of language that is used in the documents or literature and its relationship with the issue at the stake.

²⁵During my research period there were two ARCS due to transfer of previous one.

²⁶ For instance there was a meeting over a boundary dispute between two fishing villages held at ARCS office, Balugaon. It gave insight on how the nature of sources sometime create issues such as difficulties

programs²⁷, various official meetings²⁸ and on interaction of fisher with officials²⁹. As I spent considerable time at CDA, Bhubaneswar I was therefore allowed to access several discussions among CDA officials on various issues of Chilika fishery.

The interviews and observations were intended to assess state's perspective towards Chilika fishery. Narratives from these interviews are used to describe interaction between state agencies and fishing communities. These sources of information (particularly offices like CDA, ARCS, and DFO) were revisited from time-to-time to keep track of any changes in last five years. These aforementioned techniques of data collection and analysis provide a reflexive understanding of state's perspective.

As a next step, I investigate/examine implementation of DGNR in fishery practices of the Chilika Lagoon. Revisiting field is advised in extended case method to continuous dialogue between field observation and theoretical proposition. The next section of this chapter discusses methods adopted to investigate DGNR and fishery practices at the lagoon. Community narratives and observation were taken as alternative sources of information and perspectives. Observations, Focus group discussions (FGD) and Interviews were the methods applied in carrying out the ethnography of fishing villages.

2.4 Ethnography of fishery practices at the lagoon

In literature, the role social structure plays in inequality, appropriation of resources, and marginalization of fishers are predominant (see for example Nayak and Berkes 2010; Iwasaki and Shaw 2008, 2009; Mishra and Griffin 2010). Cultural and symbolic

in boundary demarcation, nature of traditional organizations and how they used to manage, and why they failed to manage at present.

²⁷ I have participated and observed four awareness and training programs conducted by CDA and NETFISH for 'wise use' of natural resources at different fishing villages. These observations assisted me to understand interactions between the state and community in the production and dissemination of knowledge. It also helped me to understand the nature of participation which is a very important aspect of DGNR. Observation is also a major source of information.

²⁸ Meetings of DFO with Bank officials, CDA officials with ARCS, and other official meeting on allocation of subsidized loan for PFCS at DFO office, Balugaon gave me insight to various issues regarding distribution of welfare schemes.

²⁹ Observation over various meetings of ARCS and DFO with fisherman who come either for renewing boat licenses or inquiring about various welfare scheme of the government gave me first hand experiences of the nature of interactions they have.

values ascribed by community to the lagoon and fishery sources in the process get related into background in literature. I therefore focus on everyday practice to overcome this dichotomy in explaining the situation of Chilika fishery. To capture the everyday life in Chilika fishery I choose to apply ECM. Fisher experiences and their everyday engagement with fishery sources, institutional rules and regulation, and state organization were identified through narratives and observations. Observing everyday practices of fishing and narratives of fishing communities were major sources of information to understand all three constituents of Chilika fishery – fishers, fishery sources, and the social dispositions. Everyday practices and experiences were audio taped to interpret later, through an analysis, the plurality of knowledge.

Community accounts of nature-society relations are considered as an alternative, and even better at times, understanding to expert knowledge because scientific explanations of various issues are viewed as reductive and non-reflexive. Guided by Bourdieu's theory of practices, I problematize the taken for granted nature of local institutions and indigenous knowledge. Bourdieu in his work on 'theory of practices' casts a spotlight on the roles of the taken for granted nature of subjective understanding and everyday practices (Bourdieu 1972; Lamaison and Bourdieu 1986; Bourdieu and Wacquant. 1999; Navarro 2006; Warde 2004). The idea of habitus has been advanced by Bourdieu (see Bourdieu 1972, 1984, 1985, 1987a), and used by many to overcome the binary of subjective vs. objective nature of knowledge (see for e.g. Everett 2002; Gregory 1981; Nash 1990; Parkin 2013). However, application of Bourdieu's 'theory of practices' and habitus to understand NRM is absent.

Focus Group Discussion

Focus Group Discussion (FGD) was chosen for data collection as a technique. FGD provides considerable insight into the internal dynamics of a community while gathering opinions of a large number of people efficiently. A FGD allows for interactions among the participants, which potentially is free, less threatening, and encourage respondents to be more open about their perspectives. In the presence of friends, respondents are assumed to overcome the shyness or being an introvert. A total of seventeen FGDs were carried out in seventeen fishing villages. These are

Berhampur, Mainsha, Sanapatana, , Gola, Parbatipur, Banmalipur, Arakuda from Puri District; Santinagar Colony, Bhusandapur, from Khurda; and Tentuliapada, Sabulia, Pathara, from Ganjam. Fishing villages were purposefully selected from 140 traditional fisher's villages, in and around Chilika lagoon. Efforts were put forth to have representation of various sub-caste fishing communities, such as Keuta, Kandara, Khatia, Nolia, and West Bengal Refugee. Village surveyed were also spread across the four ecological zones of the lagoon. Villages were chosen through snowball sampling based on the kind of issues they face.

The selected villages represent all four ecological sectors of the lagoon³⁰ and were part of all the three revenue districts of Odisha state, namely, Puri, Ganjam, and Khurda; surrounding the lagoon. Representation from all four ecological lagoon, were purposefully considered to have an overview of implication of new mouth on all the ecological zones of lagoon. Other criteria that are taken into consideration are distribution of infrastructure and difference in the nature of their sources. In social front, efforts were put forth to have representation of various sub-caste communities among fishers of the lagoon, such as Keuta, Kandara, Khatia, West Bengal Refugee, and Nolias and also community are chosen after collecting initial information on the functioning of PFCS. For example, Mainsha and Santinagar Refugee colony were chosen, as they were only two fishing communities having PFCS marketing fish catch of respective communities. Reference of officials and fishing communities were utilized to find-out these communities.

Fishers representing various sections of the society were part of the FGD. These include: old and youth; *bahanias* (active fisher), commission agents, and leader *bahanias*, and both traditional leaders and leaders of PFCS. FGDs were conducted at common and open places like veranda of community hall, landing centers, common resting places, such as under the big trees, *mandaps*, and temples. These locations were intentionally chosen for convenience of respondents. The number of fishers participating in each FGD varied from 6 to 30. This is despite holding the discussions

³⁰ Four ecological sectors are northern, southern, central and outer-channel of the lake. All four ecological sectors differ in their hydrology, biology, and salinity, and so also the nature of fishing sources and fishing practices.

either late in the morning (around 10 am) or early in the afternoon (3pm), to avoid clashes with their timing of fishing. Fishers in Chilika, especially who fish by *kbhanda*, which is the dominant fishing method, sail for fish collection in very early in the morning, usually before the sunrise and return around 8am in the morning, to deliver their catch to commission agents, middlemen, or PFCS. Again in the afternoon, around 4 and 5Pm they sail in to Chilika to set their net and trap for fishing. Besides this predominant method of fishing, fishing community who fish through *Bahani* generally go for fishing in the night. The duration of a FGD was typically anywhere between two to three hours, which was audio recorded along with field notes.

This field exercise was carried out with an objective of having accounts of fishers on Chilika fishery. Communities were inquired about Chilika fishery in general and their fishing practices, on their fishing sources, organizational arrangements, issues and incidents related to fishing. The fishers also narrated the nature of fishing and issues there when state introduced aquaculture, opened a new sea mouth, and formed cooperative societies. These wide-ranging accounts by fishing communities were subsequently organized in themes, which include failure of cooperative society, prevalence of commission agents, illegal encroachments, impacts of unsustainable fishing practices, and experiencing some common problems such as low catch. In addition, FGDs allowed me to observe nature of fishers' participation; for example, there seemed to be a conscious effort from the community to downplay disagreements. For example, most of the fishing villages denied illegal leasing. However, one-on-one interviews and visits to fishery sources reveal wide prevalent of illegal subleasing. Similarly, they did not open up about any internal conflict during FGDs.

Besides FGD, individual interviews were held with leaders of villages, president and secretary of cooperative societies, and fishers. These interactions revealed intra-community conflicts, inequality, dominance, and resistance of fishers within a community.

The above mentioned exercises of interactions (both FGD and interviews) however proved valuable in giving me an overall understanding of Chilika fishery, across its four ecological zones and fishing communities of the lagoon. Information

gathered, assisted in the selection of four fishing communities for an in-depth research investigation. I decided to concentrate on four fishing communities, i.e., Keutas of Mainsha, Khatias of Berhampur, Kandaras of Gola, and Nolias of Arakuda village. From these four, fishing sources of three communities are in outer-channel, specifically to say, fishing sources of Mainsha and Berhampur has become closer to sea mouth, while the fishing sources of Arkuda get far from the mouth. Fishing sources of Gola, however is near the channel dredged from sea mouth to the confluence of river Daya and Vargabi. In nut shell, fishing sources of all these four communities are influenced by opening of new mouth. With respect to working of PFCS, the four communities all show diversity in issues. Mainsha has a well functioning PFCs, Gola PFCS has issue of encroachment from non-fishing communities, Berhampur represents a case, where internal conflict within communities have affected the working of PFCS and PFCS in Arkuda were liquefied.

2.6 Four fishing communities: Four places

I selected four fisher villages, all single fishing communities, namely Keutas of Mainsha, Khatias of Berhampur, Kandaras of Gola and Nolias of Arakuda of Puri District. The traditional fishing practices of the four villages differ from each other. Three of these communities- Keutas of Mainsha, Khatias of Berhampur and Nolias of Arakuda- have their sources of fishing in outer channel, which has been yielding a relatively higher catch than other sources. Gola, the fourth fishing community has their fishery source in the Central sector of the lake. Conflicts among fishers and non-fishers due to encroachment are relatively high in the outer channel than in other parts of Chilika Fishery. While all four villages are governed by the same administration, it is believed that the different material and social contexts generate different forms of place in Chilika Fishery. In sections below a description of the four places selected in this research work is detailed. I begin by *Keutas* of Mainsha village.

Keutas of Mainsha: Story of a model fishing community

Mainsha is an island village located in the outer channel of the lake in Berhampur Panchayat of Puri District. Traditionally fishing by Keuta of Mainshais spread over an area of 2000 acres. The Keuta sub-communities were using *khadijala*³¹ as dominant fishing traps. However, in contemporary time, Keutas of Mainsha use varieties of traps, such as *patajalo*, *khanda* (both for fish and prawn), *banishi*, and *kankadaJala*. Recently, especially after aquaculture *khadijala*, was replaced by *khanda* and other traps. The entire fishing source of village Mainsha is divided into 60 numbers of *kbias*. Each *kbias* consists of four *khandas* and is shared by four active fishermen of the community, one *kbias* for each fisherman. Every fifteen days the sources are redistributed, fishers of one *kbias* will move to the *kbias* which is 15 *kbias* away from its previous one³². Some *kbias*, especially place of high yield are auctioned by the community for capture fishery and income so generated is used for meeting expenses of community³³.

Gramasabha is the sole decision maker for *kenta* community of Mainsha. Each family is represented in the *Gramasabha* by the compulsory attendance of a family member. Mainsha has two cooperative societies i.e. Mainsha PFCS and Balisahi PFCS formed in 1981 and 1999 respectively. Balisahi PFCS, in practice exists only as subsidiary to Mainsha PFCS, which markets fish catch of members. Mainsha is the only village where the PFCS since its inception continues marketing fish catch of the community. Despite functioning of PFCS there are three commission agents in the village, who are the main source of investment for fishing.³⁴ Both the PFCS of Mainsha

³¹ For description of various sub-communities fishing communities of the lake and their traditional fishing practices see table no 4.1 and corresponding figures in Chapter four

³² Such distribution pattern of fishing sources allows each member of the community to access every part of their fishery sources and assure a relative equal distribution of locational advantage among community members.

³³ Money incurred from auction of these fishery sources (both *khanda* and *gheri*) are used for payment of leasing price to the state, payment to various service providers such as office bearer like *Pradhan* (secretary), *dakua* (messenger), and *makadami* (legal advisors). Expenditure for legal procedures is also incurred from auction price. The money is also used for paying service providing caste groups, such as barber, priest, and washer man. Expenses for community cultural programs are also incurred from these auctions price. Participation in auction of *Khanda* sources of Mainsha is restricted to traditional fishers both from the village and outsider; however, fishers from the community itself remain in priority list.

³⁴ In Mainsha, as per rule of the *gramasabha* all fishermen of the community take their catch to Mainsha PFCS. The fish get weigh by the secretary (*pradhan*) of Mainsha PFCS, in case a fisher borrowed money from commission agent half of his fish catch are given to commission agent and half are taken by the Mainsha PFCS. Such institutional arrangement protects fishers from any kind of manipulation in weight

work in accordance with the decision of *Gramasabha*. The community is often referred as a model fishing community, firstly because of its relatively strong village organization and unity in the community. Additionally, Mainsha PFCS has secured shared in all most all welfare schemes implemented by the state for the development of Chilika fishery. Despite presence of two PFCSs and functioning of Mainsha PFCS, majority of fishers from Mainsha depend on commission agents for investment in Fishing³⁵. The presence of commission agents with cooperative marketing system in Mainsha is at times challenge the state's idea of forming PFCS to eliminate commission agents from Chilika Fishery.

Opening of the new mouth has brought many changes to traditional sources of fishing in the community. Opening of newmouth has reduced distance between their fishing source and sea mouth, and path of fish recruitment from the sea to the lagoon fall in the fishing source of the community. Consequently opening of new mouth has altered the hydrology of the fishery sources of Mainsha.

At Mainsha, I stayed for over a month, and conducted 48 numbers of interviews. Interviews were carried out in most of the household of the village. Interviewees are fishermen, commission agents, the village head, office bearers of *gramasabha* and PFCS.

Khatia community of Berhampur

Berhampur is an island village located in the outer channel of Chilika. Berhampur is situated in Krushnaprasad Block of Puri district and inhabited by fishers of *Khatia* community. *Khatias* of Berhampur were one among well of fishing communities of Chilika³⁶. Traditionally *Khatia* communities were fishing in groups under leader

and price by commission agent. It is because the commission agents are directed by the *gramasabha* to price fish according to the market rate.

³⁵ In Mainsha there are three commission agents, each having 20/30 numbers of Bahania. Loan amount vary from twenty thousand to forty thousand. As per rule of the village they don't incur fish directly from fishers. Fishers deposit all their catch to PFCS, and the secretary weighs the catch and give 50% to respective commission agents.

³⁶ Before opening of the new mouth, due to the then locational advantage the productivity of the fishery sources of Berhampur was reported to be good. Consequently many fishers of the villagers are having agricultural land though fishing is the major source of income and the community was doing good in other developmental parameter like education.

*bahania*³⁷ by using *khadijala*. Like other fishing communities of the lagoon this community, at present, predominantly uses *Khanda*. Few also do angling. Fishery source of Berhampur is divided into two parts. This division of fishing sources is resulted from the dissolution of *gramasabha* into two sections namely *Bada Panjha* and *Sana Panjha*, due to internal conflict within the community. These above mentioned two groups alternately access the two parts of their fishing sources.

There are two PFCS in Berhampur, i.e., Berhampur PFCS and Pragati PFCS. Berhampur PFCS was formed in 1959 and it is one of the oldest PFCS in Chilika. Pragati PFCS on the other hand is a new one formed in 2011. Berhampur PFCS now belongs to *Bada Panjha*, and fishers from the *Sana Panjha* constitute Pragati PFCS. Both PFCSs are reported to be defunct, due to the absence of marketing and taking sublease of their sources. Consequently, fishers of Berhampur are predominantly dependent on commission agents for both initial investment and selling of their fish catch. The number of commission agent goes around 20 in Berhampur.

The opening of new mouth has similar impact on fishery sources of Berhampur and Mainsha as their locational characteristic are relatively same. In the migration route from the sea towards the lagoon fishery sources of Berhampur comes first and then that of Mainsha. So the influence of sea mouth is comparatively higher in fishery sources of Berhampur than Mainsha. Prateep Nayak (2014) found the opening of new mouth has resulted in sand deposition, changing nature of hydrology, and declining catch from fishing sources of Berhampur. Occupational displacement and outmigration after opening of new mouth are very common in the household of *Khatias* of Berhampur.

Interviews conducted in Berhampur consist of around 30 fishermen from various sections of the community. They consist of young and old fishermen, traditional village leaders, leaders of PFCS and commission agents.

³⁷ Leader Bahania, refers to the leader of a fishing group. Leader Bahania were chosen on the basis of their better skill and experience in fishing.

Kandara community of Gola

Gola village is in Panshapada Panchayat of Puri district and is situated on national highway 203A, which connects the town of Puri to Satapada. Gola has good connectivity with the market. Their fishing sources are located three kms away from the village. The fishing community belongs to Kandara fishing sub-community. Kandaras according to their traditional method of fishing they fish by using *baja* and *dhaudi*. Kandaras of Gola have migrated from the western bank of Chilika lagoon in post-independence period. Kandaras are the second largest fishing community in Chilika lagoon, and are at the bottom of the caste hierarchy among fishing communities. Fishing sources of Gola fall in the central ecological zone of Chilika and is near the confluence of river Daya and Bharagabi, and considerably affected by the dredging of channel from the sea mouth to river confluence. Their traditional fishery sources are shallow areas of the lagoon, which is very fertile for culturing prawn.

Fishing community of Gola has one PFCS, namely Bagdevi PFCS, which takes lease of the fishing sources. One-third of their leased sources are, however, encroached by neighboring non-fishing villages. Since the late 80s there is no marketing of fish by their PFCS. Fish catch from traditional fishery source of Gola has declined leading to occupational displacement and migration.

For my field work, respondents are taken from every household in the village. Respondents include fishers, commission agent, village leaders, president and secretary of PFCS. Both men and women constitute my interviewees at Gola. I had conducted 30 interviews in Gola.

Nolia community of Arakuda

Village Arakuda is located near the 'old mouth' and is inhabited by Nolia communities. Nolias have migrated from Andhra Pradesh and are both Odia and Telugu speaking fishing communities. Traditionally fishing sources of Nolias being nearer to the old mouth, was a deep and flowing water body. However, after opening of the new mouth at Shipakuda, i.e. 20km away from the village, the traditional fishing source of Arakuda has become a shallow and stable water body. The fishing source, which constituted the mouth itself, after opening of the new mouth, natural recruitment of fish to the

source has sharply declined. Nolias of Arakuda, traditionally fish both in the lagoon and the sea. After opening of new mouth, with decline in their catch from their traditional fishing source, Nolias of Arakuda become more dependent on marine fishing. Fishing in sea needs comparatively more investment. Consequently, the community hugely depends on commission agents for investment in fishing and marketing of their catch.

Nolia community practices unsustainable fishing, such as juvenile catching and use of small mesh size fishing nets. The earlier Arakuda PFCS, which was one among the oldest PFCSs under ARCS, Balugaon was dissolved. However, three marine PFCS are registered in Arakuda. None of the PFCSs are reported to be functioning. With unproductive fishing sources and weak *gramasbha* there is a near absence of any community regulation of fishing in Arakuda.

The fieldwork in this village was predominantly concentrated to one lane (*sahi*), i.e., Laxmi Narayana Sahi of the village. A total of 60 respondents both men and women include fishers, commission agents, and political leaders of the village were interviewed during a period of one month.

These four places differ on both materiality of the fishing sources and socio-economic characteristic of communities. Nature of these four places is found to be interacting with their socio-cultural dynamics by the process of accommodation and resistance. In this context, an adequate understanding of co-construction and co-production of nature-society relations need to take account of aspects of time in such relation. As discussed in the previous chapter, a place-based understanding of nature-society relations situates 'place' in relation to dynamics operating in numerous spatial scales. To understand nature-society relations at a place the layers of experience among respondents were uncovered to discern all forms of contradiction and similarity.

2.7 Limitation of technique and Refinements made to improve

As the field work progressed, many refinements were undertaken in the processes of data collection. Usually, ethnography is associated as follows:

“Ethnography required living with a group of people for extended periods, often above the course of years or more, in order to document

and interpret their distinctive way of life and the belief and values integral to it.” (Atkinson and Hammersley, 2007)

My study at Chilika spread over a period of five years, was interspersed with stay extending to two month period. This is because of several reasons. For instance, in Gola, there was no household with sanitation facilities and in Arakuda, I didn't find a household that will rent their place to an outsider, single woman, because they don't see their village safe. Hence, I commuted frequently to the villages by staying outside the two villages.

In the beginning I conducted semi-structured interviews at Mainsha, however, responses were cryptic. Next day, I stopped administering the questionnaire, and even stopped making notes of our conversations, which yielded a more detailed response from the respondents. By shifting to open-ended questionnaire I found the discussions informative and yielded insights on inter-and-intra-community dynamics. While there was no fixed sequence in which the conversations were to proceed, I always however kept in mind the issues that are to be discussed. At times, when I missed out on some important question to discuss, I went back to my respondents.

I found that the initial few minutes of interaction critical, and is to be used for building mutual trust and to establish tone of the discussions. For example, if I am talking to a fisherwoman, the conversation starts with family and household issues. If on the other hand, I am interacting with fishers returning from fishing, the discussion would invariably start with the quantity of fish catch on that particular day. Often my respondents were suspicious of my intentions, and would invariably seek my assistance in securing governmental benefits. Frequently, I was suspected by my respondents as a journalist, or a surveyor from government agency. For example, in Arakuda respondents often perceived me as a reporter who can report all the illegal and unfair practices going on in their village. This perception I believe may have affected information provided by the respondents. Other times the respondents avoid answering and instead suggested that I speak to leaders of the village. Often female respondents advised me to speak to their husbands or a male member of the family. Many-a-times, unless I spent an extended period of time with the respondent discussing various sundry topics, the respondents would not provide a reflective and

detailed answer. This investment in building confidence was essential to develop a thick description.

As an outsider, and belonging to a non-fishing community many-a-times created an identity of 'other' with my respondents, which impacted my conversations. Being a female researcher I did not have free and unfettered access to all public spheres and was restricted to few spheres of community life. For example, I was not allowed to attend village meetings. This prevented in gaining a perspective on village and community level activities. Community places in a village are generally considered exclusive 'spaces of men', and discouraged my presence especially by leaders of villages who were concerned about my safety. Often, I was advised not to be out in the village during late hours in the evening.

Gatekeepers played an important role in the nature of information I gathered. In three villages, the person introducing me to the community played, albeit indirectly, the role of gatekeepers. In Arakuda, the fourth village, I was suggested to take the help of a villager, who stayed throughout with me during the conversations. The presence of a community person facilitated bringing respondents into confidence, was, however, at times, this task, was intentionally influencing the response of interviewees. To minimize such biases, I interacted with respondents, additionally, at other times.

The setting of interview many-a-times, I found play a role in the degree to which the respondents are free to reveal their perspective. Most of my respondents while in private places like inside their home were open about conflict within community, but were conscious and guarded in their response when speaking on verandas³⁸. In private, informants were willing to disclose information and express opinions without fear, but they would not share the same thought in front of others.

At times it was a challenge to determine how much I should disclose to a respondent, especially when they seek an opinion on various issues that were markedly different from their perspective. This is because expressing my opinion runs the risk

³⁸In rural settlement, most of the houses or build would have a porch along outside the house, mostly of higher elevation and open to the road. A veranda plays an important role in the social life of villager, and is one of the spaces of communication between the family and other villagers. Often it plays a role of drawing room in modern house architecture.

of respondents choosing not to speak in order to avoid an argument. However, continuous dialogues often helped to overcome hesitation of the respondents. As most of my interactions were in the form of informal conversations there was always a possibility of co-construction of interview data³⁹. To minimize this situation I allowed my interviewees to talk at length in his/her own terms.

2.10 Conclusion

A Place-based DGNR, as proposed here, sees human-nature relationship both in terms of reliance and care, livelihood and way of life, moral and calculative and the relation between being and place both in terms of 'place attachment' and 'place utility'. In 'place' both, structure and agency, and human and non-human agencies are active and continuously shaping and reshaping of human-nature relationship. The aim of this method and methodology is to secure a reflexive insight. Seventeen FGDs in and around the lagoon and ethnographic investigation at four fishing villages in outer channel have allowed me to understand existence of seemingly contradictory claims on implementation of decentralized governance of natural resources. My fieldwork at Chilika was intended to understand nature-society relation through everyday time frame. The research was designed to tap multiple sources of information to enhance richness and validity of information. By doing ethnography through ECM I could explore the way in which all seemingly contradictory elements shape fishery at the four places. Unpacking all these complex dynamics from narratives and observations allows me to put forth the thesis that social disposition, agency, and nature are continuously reshaping Chilika fishery.

³⁹ In process of interviews especially when it is unstructured there it is more like discussion on a topics, if researcher is not careful there are every chances of influencing answers/conversation. Interview is like an intervention in to the life of interviewees, and many time the presence of researcher (active) itself bring changes into the way people respond to an issue.

Fig 2.1: Location of Fishing Villages Selected for FGDs



Source: CDA 2012a

Note: Locations of villages are not geospatial

Chapter 3

State's Understanding of Decentralized Governance of Natural Resources

3.1 Introduction

A large number of communities, spread all over the country, are managing their natural resources, such as forests, water, wildlife, and fishery. The indigenous and traditional institutional practices regulate the relations of its members with natural resources that manifest in their age-old cultural, social, economic, and spiritual values. State's in its approach to managing natural resources has also began to acknowledge the importance of indigenous, traditional, and community practices of natural resource management. Consequently, state is initiating measures to draw this knowledge through their participation and to give them legal rights over the management of the resources. In this connection DGNR is promoted by the state as a key policy because it is believed that natural resources are managed better when there is an integration of cultural and material richness of people's relationship to natural resources, in decisions (see example of such approach in Berkes and Folke 1998; Berkes 2003; Saunders 2012; Shrivastava and Kothari 2012).

DGNR seeks ecological democracy that demands meaningful involvement of local institutions in NRM, devolves power from central authority to local authority and often to indigenous communities, reconcile objective of socio-economic development with natural resource conservation, protect or legitimize local/indigenous right to use and own natural resources, and integrate of traditional/local value and wisdom to modern NRM practices.

However there are also some counter arguments in terms of its failures and many studies have found inadequate implementation of DGNR objectives (Agarwal 2010; de Souza 2010; Karlsson 2011; Larson and Soto 2008). Failures are perceptible mostly in micro-level studies. Several authors have found decentralization by state as a possible way to reduce cost, deflect blame, or extend state's reach further into social processes rather than empowering the community (Agrawal and Ostrom 2001; Lele

2014). Issues of deficiency in implementing DGNR were more evident than the expression of efficiency and effectiveness (Kellert et al. 2000). This is despite significant effort at various levels such as academics, administrators, and members of civil society for advancing DGNR. According to Brown (2005), integrating knowledge, values, traditions, and aspirations of multiple stakeholders, community, conservation organizations; and the state remains a challenge in participatory conservation.

This chapter documents how presently DGNR is departure from conventional NRM, along with a discussion on the limitations of the current trend of DGNR in transforming policy understanding of human-nature relations. The nature of transformation or reformulation (be it institutional, political, and epistemological) DGNR brings to conventional NRM is also discussed in this chapter. The next section starts with a discursive analysis of environmental policies in India.

3.2 Discursive analysis of NRM policies in India

Efforts to control forests, agricultural lands, and other natural resources that were common pool resources started during the colonial period. For example, the first Indian Forest Act (1865) and the New Indian Forest Act (1927) were promulgated to extend government control over forests and lands. An intensification of exploitation and degradation of natural resources, especially of forests through deforestation, commercial logging, and plantation agriculture happened during the colonial rule. With independence from colonial rule in 1947, and establishment of the Indian Republic in 1950, control over resources, such as land, water, and forests passed on to the government. A model of centralized planning was dominant in the post-independence period, which placed an emphasis on the use of natural resources for nation's development, especially industrial development. This is evident in the third five-year plan when for the first time a separate section was dedicated to natural resources that gave emphasis on exploration, assessment, and utilization to spur economic growth. The State however, starting 6th five year plan began to incorporate concern for conservation and environmental protection more pronouncedly by setting up a National Committee for Environmental Planning and Coordination (NCEPC) in 1980. With this initiative, the need for setting up an exclusive Department of

Environment was recognized and this was followed by considerable efforts being placed to conserve natural resources, such as forests, water, and wildlife. Ironically, in fishing sector, there were continued efforts by the state to multiply the quantity of fish catch through mechanization, efficient marketing, and placing an emphasis on exports⁴⁰. During the colonial and in the post-colonial period, state had possession over the use and management of natural resources and during this period there was severe decline and degradation of natural resources. For example, the country lost approximately 4.24 million hectares of forest between 1951-80 (Shrivastava and Kothari 2012).

Conventional conservation approach towards NRM was mostly under the presumption that individual resource users will be the rational decision maker, who always will maximize their utility. Applying this rationale, Garret Hardin had this to say about common resources:

“Each man is locked into a system that compels him to increase his herd-without limit- in a world that is limited. Ruin is the destination towards which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons”. (Hardin 1968: 1244)

Critiques of Garret Hardin (1968), as early as in 1970s advocated participation by local drawing on social justice approach to conservation. Social justice approach to NRM beliefs that the poorest and most vulnerable groups are disproportionately experiences negative impact of conventional NRM practices, this is because they are highly dependent of natural resources (see Adger 2003; Adams et al. 2004). Community-Based Natural Resource Management (CBNRM) was advocated by rejecting the idea that free riding individual would necessarily undermine collective action within communities, and thereby rejecting the assumption of a rational being and primarily to an efficient market. The idea calls for sharing control over natural resources, such as forests, land, and water, with communities by making them a part of decision making (see Brosius et al. 1998 and Pagdee 2006).

⁴⁰ Even at the current trend of fishery management of our country is overwhelmed with research on production and economic dynamics of fishery. One can sense the dominance of technology and economics in fishery at the website of Fishery Survey of India, which has hardly any information about fishing communities of the country.

By early 80s intense debates ensued across the world, as well as in India, as to how natural resources can be most effectively manage and the role played by the state, village communities, and individual owners (Agarwal 2010). Local communities seem to suffer most when state constructs big dams, allows deforestation to meet industrial need and facilitates mechanized and trawler fishing. Chipko Movement (1973), The Silent Valley Project (1978), Jangal Bachao Andolan of 1980s, Navadanya Movement, Narmada Bachao Andolan (1985), and mobilization of traditional fisherfolk against state promotion of commercialized fishery are some of the prominent examples highlighting failure of state's approach to NRM. Elinor Ostrom (1990) and Wade (1998), going beyond Hardin's pessimistic generalization have argued that individual decisions are influenced by the situation and context. Hanumantha Rao Committee Report (1994) suggested the participation of different stakeholders (GoI 1994) in watershed management. In the eighth plan (1992-97), the Indian government starts a new scheme that not only developed alternatives to the resources of Wild Life Protected Areas (WPAS) but also sought to involve communities in their management. In 1990 JFM was launched with intent of involving communities in protecting forests around their villages, recognizing community's right to harvest forest products, and to receive a share of revenue earned from the forest. In Marine sector, however, it is only recently, in 2005, Sawminathan report advocated for the participation of local fishing community for integrated management of coastal resources (GoI 2005). Many viewed CBNRM would balance the goals of conservation and development (Berkes et al. 2001; Buscher et al. 1993; Feeny 1990; Gadgil et al. 1993a; Jentoft 1986; Jodha 1990).

This shift in state's approach to NRM is articulated by Shrivastava and Kothari as follows:

“...there was considerable rethinking within the political and bureaucratic classes. The government brought in path-breaking policies.... There was a paradigm shift in policy towards forests, putting their ecological and social values above commerce and an umbrella law to protect the environment was promulgated”. (Shrivastava and Kothari 2012)

Thus peoples'/community participation in governance of natural resources began to be seen as building a robust democracy, which added strength to the idea of decentralization⁴¹ (see Agarawal 2010).

The changes brought about in NRM are due to several reasons, including public demand, non-cooperation of communities with state, environmental movements, insistence of funding agencies, pressure from civil societies, who all have recognized the high social, and ecological costs that undergird economic successes claimed through NRM policies (Ribot 2004; Guha 2013; Lele 2014). There is a need to rescue NRM from 'globalism', 'generalization', 'growth based developmentalism'; which put a rational individual in the core of all the assumptions that undergird NRM strategies (see Baland and Platteau 1994; Mosse 1997; Oommen 1991; de Souza 2010).

Efforts to strengthen local institutions are mainly through empowerment of local community by allocating adequate power and responsibility (Lele 2011). This marks a shift from an expert-based approach to participatory conservation and management (Gjertsen and Niesten 2010; Bray and Valazquez 2009; Armitage 2005). Resource users are included in the decision on conservation practices, and this shift is predicated on the belief that indigenous knowledge contributes to sustainable use of natural resources (Bray et al 2005, 2008, Nepstad et al 2006, Gjertsen and Niesten 2010). This transformation recognizes the significance of local institutional arrangement, their traditional knowledge, practices, rules and regulation that developed through the adaptive process and the knowledge of which is handed down through generations. Decentralization in NRM refers not only as an alternative to state-centric approach but also the best way to manage natural resources (see Ostrom 1990; Pinkerton 1989; Berkes 2003). Advocates of DGNR argue for strengthening the traditional institutions/organizations through which rules and regulation of communities are made and remade in relation to identity, affinity, exchange, and reciprocity across places (Rocheleau 2001; Sekhar 2003, 2004; Iwasaki and Shaw 2008;

⁴¹ In India, the idea of decentralization can be traced to 1920 when statutory village council were set up following the recommendation of Royal commission on decentralization in 1909 and the Government of India Act 1919. In the sector of natural resource management, forest council rules of 1931 permitted village residents to create forest councils and to bring under their own control forest lands and to make decisions regarding resource use and access (Agrawal and Ostrom 2001).

Iwasaki et al. 2009). This is because as Shrivastav and Kothari (2013) put it - links to a place/local, which challenges unrootedness and resists the force of generalization and rationalization in NRM. Furthermore, DGNR strengthens roots for democracy, pluralism, and rights (Ribot 2004). Advocacies for “place-based models” (Berkes 2003; Scott 1998) is based on the assumption that

“As these (local) people economically and culturally are dependent on their immediate surrounding they always try to preserve biodiversity and as have used the same territory for generations they can bring to planning a long historical memory and complex understanding of the impact of human activities on a particular geographical area and all its resource”. (Berkes and Folke 1998)

This is a shift that many describe as a paradigm shift in resource management from a merely economic of valuing a commodity to recognizing the socio-cultural values ascribed to the natural resource at the stake and environment and to considering importance of the ecosystem and place, which contain both nature and human (Williams et al. 2013; Wysocky 2012; Zimmerer 2000).

A review of the national, as well as international experience across various sectors, shows how decentralization, is happening, but it is not sufficient condition for successful resource management. Citing Mosse (1997: 266-67), de Souza (2010) stated: policies guided by problematic discourses see human/resource users as appropriators, village organization as ‘management association’ and the village social system as a business. For a better understanding of the transformative potential of DGNR, in the next section, I review assumptions that undergird DGNR.

3.3 DGNR, devolution of power, and empowerment of local

Decentralization of NRM practices are promoted for developmental reasons, and decentralization has been justified for increasing efficiency, equity, and inclusion through democratization and increasing people's participation and in increasing legitimacy of state (Ribot 2002⁴²; Webler and Tuler 2001). The 8th five-year plan flags the importance of local and potentiality of inclusion of local into decision making. As stated in 8th five-year plan:

⁴² As cited by Larson and Ribot 2004, Ribot, J.C. 2002. Democratic Decentralization of Natural Resources: Institutionalizing Popular Participation. Washington, DC: World Resources Institute.

“Experience of developmental planning has shown that developmental activities undertaken with people’s active participation have a greater chance of success and it can also be more cost effective as compared to developmental activities undertaken by the government while people become a passive observer. The non-involvement of people has led to the implementation in them of an attitude of total dependence on government for everything so that there has been lack of effort by the people and lack of accountability to the people in the system of administering developmental scheme... In the eighth plan it is necessary to make development a peoples’ movement, peoples initiatives and participation must become the key element in the whole process of development. No government can protect, regenerate, and ensure sustainable use of natural resources on it’s own. It is essential therefore, to decentralize control over natural resources.” (GoI 1992)

Subsequently, in ninth five-year plan an emphasis is placed on decentralization across all sectors of natural resource management. Numerous local institutions are created/formed. However, the actual extent and effectiveness of devolution of power is questionable (Lele and Menon 2014). Local communities are only marginally more empowered with the implementation of DGNR (Kellert et al. 2000), and the state’s predominance has hardly changed (Lele 2014). Moreover, the entitlement of natural resources (forest, biodiversity, water) remain largely with the state, and government officials often intervene, if the local institution did not perform within the parameters of approved management plan. Participants and planners often disagree about what constitutes good practices, and the perspective of bureaucrat prevails (see Weblert and Tuler 2001). In studies on DGNR, it is often found that the degree of decentralization to be insufficient (Bosak 2008; Buscher and Whande 2007). In most cases, decision-making power remains centralized or given to elite actors, such as bureaucrats, who are unaccountable to local people.

The current trend of decentralization creates representative structure and recognizes the importance of local institutions, but often replaces the traditional institution with new and external and uniformly designed institution. As Ribot (2004) found in his research, central government chooses upwardly accountable institutions as a part of their strategy to maintain central control over the natural resources, which undermines the interest of the local and makes bureaucrats less accountable to the local authority. Additionally, the nature of decentralization is very restrictive as the

power over natural and financial resources being allocated to local authorities are extremely limited and highly controlled through excessive oversight and management requirements (Robbins 2000; Ribot 2004). Many factors shape local issues, such as capacities of local people; political and social histories of place; forms of local social organization; degree of local stratification; tenure relations; the strength and manipulation by elites; incentive structure; failure to account for time and insecurities produced by change; and many others.

The current trend in implementing DGNR does not fundamentally change conventional NRM practices. For example, in DGNR, natural resource issues are perceived either through social or ecological lenses, is to say humans and nature are either in opposition and/or in isolation of each other. According to the 11th five year plan:

“Integration of this approach (DGNR) to protected area management through shared decision making and full integration of conservation and livelihood across the landscape are yet to be realized, also the recognition of diversity in community traditions or new initiatives towards conservation is very weak”. (GOI 2008: 193)

The challenge for implementing DGNR lies in attending to heterogeneous nature of the community and villages, resources, complexity, and dynamics of human-nature relationship at the local level.

3.4 DGNR: natural and social dynamics of resource issues

DGNR, which has been advanced to capture/understand community's role in NRM, and changes occurring in and across communities, jurisdiction, and natural system, has however failed in practice. This is because management of natural resources predominantly biological and economic indicators that are developed through extensive data collection. Efforts to gather data on community process in NRM are meagre (Martin and Hall-Arber 2008). As cited by Martin and Hall-Arber (2008) from Olson (2005):

“communities are positioned primarily as sites for “impact analysis” rather than as central to the dynamic of development or as agent of conservation; to the degree they are considered, they are location subject to environmental change, economic decline, and of course, management measure”. (Olson 2005)

In advancing “conservation for development”, one finds ecological characteristics are often accorded priority and simultaneously compromising and subverting the socio-economic interests of the local (Buckworth 1998; Bailey and Jentoft 1990; Alcock 2004). This approach towards community resulted in NRM policy failure due to limited nature of policy understanding on ‘communities’ and political-cultural nature of local practices (see Darman and Ferguson 1995; Degnobal 2003; de Souza 2010). Nature, environment, and natural resources are reduced to mere aesthetic value. When such assumption undergrid DGNR, like conventional NRM, scientific (objective) knowledge transform a complex socio-biophysical effect into an unproblematic object that can be readily measured and quantified. Consequently, DGNR resulted into producing biased and insufficient understanding of issues and their possible solutions. State understanding of local issues, which is often based on models developed in different context and at different places failed to address local issues and consequently failed to bring cooperation of locals.

DGNR advocates for sear involvement of locals in the decision making of NRM with the wealth of scientific knowledge and technological data (Meredith 2002). Integration of local knowledge is one of the major objectives of DGNR, however, there are often references to: less effort were made to strengthen traditional practices, little attempts were made to incorporate or consult historical system, traditional and experiential knowledge, and observation and opinion of local people into management practices (Kellert et al. 2000).

With the integration of local knowledge and wisdom into NRM, the relevance of local context and local acceptance gets easy for successful implementation. Ethics of NRM suggests to discard both egocentric and ecocentric ethics and to work for a *partnership ethics*, where both humans and nature are of equal importance and in a mutual relationship (Merchant 1997), which again seems to be well understood by indigenous people and communities in their traditional practices and wisdom. Here a quote from St. Martin and Hall-Arber (2008) seems important.

“If communities are to be more than just site of impact, if they are to be actors within the institution that govern access and utilization of fishers’ resources, they and the resource area upon which they depend must be made visible such that they can become sites of negotiation and experimentation”. (Martin and Hall-Arber 2008)

A particular place has an organic boundary for community life, an intrinsic value of the natural system that needs to be preserved and restored, and affirms spiritual and cultural dimension of place (Nelson and Weschler 2001). The current trends in implementing DGNR, reduces the utility of 'place' and community to a mere location; which brings about an understanding of 'place' that is un-reflexive, isolationist, and exclusionary (Ball 2006). A reformulation of 'Place' in DGNR agenda would begin by questioning the neutral nature of scientific knowledge.

Further, there is a need to recognize that society is ecologically embodied⁴³. To understand embodied reality of the unity, Casey's (2001) concept of 'geographical self' (the nature of the human subject who is oriented and situated in a place) seems useful to explore and understand the behavior of a community, especially of an individual. Place, community, and individuals are constitutive of each other and nature and culture can't be sufficiently understood as an individual entity (Ball 2006). A reformulation of the concept 'place' in DGNR brings about an ontological reformulation, that is humans and nature are interdependent and mutually constitutive.

3.5 DGNR and value of resource at stake

Different interest groups value natural resources differently. This is because environments as well as natural resources are perceived differently by communities and individuals according to their cultural beliefs, their claims of belonging to a social group, or political reasons, which again they acquired from the socio-ecological system they live in (see Clement 2009; Hames 2007; Vandenabeele and Wildemeersch 2010; Eriksen et al. 2005). For inclusion of cultural and subjective value assigned to natural resources and the environment by locals, the idea of 'community' and 'resource users' will include soils, water, plant, and animals, or collectively the place (see Merchant 1997, Leopold 1949).

Besides the material aspect being valued culturally the affective aspect of human-nature relation is also included in DGNR. The 'knowledge and feeling for place' can strengthen the tie of person and community to the purpose of more sustainable

⁴³ "Society is more than mere interrelationship i.e. network and flows between people or social roles. It is also those interrelationship and natural stocks and sinks, land, agricultural systems, tools, buildings, and non-human animal. In other words society constitutes of "lateral" and "horizontal" integration between non-human beings, ecosystems, tools, buildings, and non-human animals". (Carolan 2005)

practice’ (Nelson and Weschler 2001). The *sense of place* refers to the perception of the long term residents or the local that encompasses their every day and ideological rootedness (Tuan 1975, 1979). Sense of place is based on local culture, which has rooted the self to their community territory, both emotionally and logically. The concept of ‘sense of place’ has the potential to bridge the gap between the science of the ecosystem and their management by recognizing people as the part of the ecosystem (Brown 2005).

To understand the transformative implication of place-based conservation is to consider place as a social analogue to the ecosystem concept. As stated by Ley (1977) ‘place always has meaning and this subjective meaning of place carries not only the intent of the individual but also affects behavior of contemporary as well as forthcoming generation.’ Such understanding of human-nature relationship is complex, but as rightly noted by Pocock (1983) ‘being in the world should appear complex’ and that being should be understood in terms of insiders through their beliefs, values, and intentions. Hence, place is a geographical space, and a ‘perception enabling prism’, which has relevance to understand human and natural resource relations (Merrifield 1993). Accordingly a reformulated concept of place in DGNR will not be confined to materiality and wilderness, but will be extended to capture values ascribed by locals. Reformulating place provides a framework for a reflexive narrative of environmental history of individual, community, and village (Ball 2006).

3.6 DGNR and understanding local communities

Typically in DGNR one looks to place institutional arrangements that are geographically local, and are of small scale units, such as a village or a community. This view is captured by the apex bank for rural development, NABARD, as follows:

“Past experiences of natural resource management clearly shows how Gandhiji’s concept of village republics can work for ecological regeneration – each village with an active community forum and an ecosystem of its own to control, manage and share the common resources developed and improved with equity”. (NABARD 1996: 5)⁴⁴

⁴⁴ As cited in de Souza 2010, NABARD. 1996. “*Guidelines on Participation in Indo-German Watershed Development Programme.*” Mumbai. National Bank for Agricultural and Rural Development.

However in Indian villages a combination of factors, such as caste, gender, and class regulate the access and usage of resources (de Souza 2010; Joda 1990, 1995; Sikor and Lund 2009; Semmens 2005; Agarwal 2010) and the embodied nature of the individual is to be recognized. de Souza (2010) in his book 'Water and Development' has rightly said that:

“Merely having a revenue boundary for a village does not make it inhabitant into a community, nor does its long standing history. Community gets continually constructed and reconfigured by internal and external factors. Communities are ongoing creation whose social boundaries and the means of holding the community together keep varying over time. They are thus fluid and changing”. (de Souza 2010)

DGNR's conception of place –as a container of community- and community –as a homogeneous entity- doesn't allow a complete understanding of how the historical context and politico-economic structure affect local rules-in-use, their everyday engagement, and local decisions on NRM (Clement 2009).

An analysis of failure- and-success of DGNR indicates that the objectives are not met because there is poor understanding of the basic conditions necessary for effective decentralization (Clement 2009; de Souza 2010; Agrawal 2010). For example there is an assumption of a homogenous and egalitarian 'community', which overlooks intra-community differences, power, and politics (Mehta 1999; Mehta et al. 2001). The social and cultural conditions in which human-nature relations at local level have evolved, everyday context within which institutions are located, and the rootedness of locals and their institutions in local history and society are poorly incorporated into DGNR practices. For the most times village, community, and place are only the loci of decision-making. However political economy approach to NRM consider role of power relations in NRM as determining factors on who gets what and how (Bates and Lees 1996:9). Political economy approach problematizes the concept of stakeholders as they possess different power capabilities and have different rate of accessibility to resources. These discourses in NRM somehow get confined into the debate of local and extra-local, community, and other (see Ernfeld 2003; Boyed et al. 2001; Bridge 2011; Dujovny 2009; Mehta 2011; Rees 1985; Ronnback et al. 2002; Ross 1999; Sacks and Warner 1995; Sheppard 2001). Political economy approach to resource management give special insight in to how state mediated resource management

practices being dominated by neo-classical economic world view reduces accessibility of poor people by imposing taxes and licenses on the use of resources (Mishra and Griffen 2010) for example, facilitating project like ecotourism (Schroeder 2005; Kepe 1997) and commercial logging (Simsik 2004) at the cost of local livelihood. In this context, traditional communities and their local practices are seen as sustainable and just both socially and temporally (Beck and Nesmith 2001).

Local representatives are assumed to be responsive and accountable to their village and community (Ribot 2002, 2004). However, local representatives emerge in a particular socio-ecological history of the place, which remains poorly understood. Discussion around the belongingness, the socio-historical evolution in the community, and whether an autonomous and homogenous domain of decision making is even possible at the local level are not well attended to.

3.7 DGNR and understanding being as a geographical self

DGNR is promised against the conceptualization of human behavior as entirely self-centered and utilitarian (Jentoft 2000). On the other hand conceptualizing individual as completely a community being will undermine role of individual interest in decision making. As stated by Leopold in Land Ethics:

“Individual instincts prompt him to compete for his place in that community, but his ethics prompt him also to cooperate”. Leopold (1949)

Everyday engagement of local community with the resources at stake is both calculative and moral, and is very much guided by the social disposition of human agency and context of the situation. Studies on local institution advocates to concentrate on the micro forms of power that are made, transformed, and sustained by institutions. As stated by Clement (2009):

“To understand power relation in a local community, the definition of power has to go beyond the capacity of an agent to influence a target. It encompasses third dimension of power introduced by Lukes (2005): power manifest itself just by being, it shapes values, norms and preferences by its mere existence”. (Clement 2009)

As argued in the first chapter, all three constituents of the place are continuously shaping everyday practices at a place and rather the place itself. Casey argues that there is a close reciprocal relation between co-existence and co-creation

between place and body. Embodied humans take on the characteristics of the places they inhabit and those places, in turns are modified to suit the dwelling practices of the human. Understanding emplaced self, requires a reflexive understanding that analyzes both social and biophysical dynamics that shape human agency and get reshaped in everyday practices. As advocated by Lefebvre and Bourdieu (see Bourdieu 1972, 1985), such a complex understanding of being is only possible by investigating everyday practices.

It is the reflexive insight to the nature of relations to NRM that will allow one to ask- who speaks in the interest of whom? Or how do patterns of society-nature relations emerge, consolidate, and recede through processes of legitimization, inclusion, exclusion and resistance? Or why everyday practices have been shaped in a certain manner? Or whose practices and which institutions are seen as legitimate? Or who are these actors participating in the institution design and what are the interests they protect? And how design of institutions affects nature-society relations? These questions at the level of community shape reflexive insight.

3.8 Conclusion

From all the above discussions it can be observed that DGNR, which is advocated as a paradigm shift in NRM, is however mostly visualized as a structural and procedural change.

While the direction and initiatives taken thus far to implement DGNR are essential but does not realize the full potential of DGNR. For this, a better understanding of local practices is required. That is to say for meaningful participation of community and locals, inclusion of cultural value of resources and indigenous knowledge, planning procedures to address continually changing community characteristics need to be place-based. The concept of 'place' has long concerned scholars and practitioner alike in fields of land use planning, geography, environmental studies, anthropology, and sociology. The literature on place is vast and varied, however, the register of place in DGNR is usually a location or area, which makes the existence of place as given and objective. This objective form of conceptualizing the place limits the scope of understanding complexity of local practices. A fundamental

transformation through DGNR, especially on the way relations between nature and society are conceptualized is yet to be realized.

Conceptualization of place should allow one to question basic assumptions that undergrid conservation planning, such as linear progress, scientific rationality, the autonomous self, and the individual as community self. Decisions are shaped by the situation, which in terms of Ley (1977) include: incomplete and inconsistent information, values and personal attitude, short-term motives, and long run beliefs, which again are not independent of context. This is to say that a reflexive understanding to multiple of experiences and practices, incorporating subjective values in decision making, revealing the logic behind the everyday practices are reflected in the formulation of place.

A reflexive understanding is, as cited by Edwards (1996) from Rorty (1979), ‘a matter of conversation and of social practice, rather than as an attempt to mirror nature’. Therefore knowledge is recognized to be associated with power, that is, the institution that produces and sustains the knowledge. A reflexive understanding allows one to view the knowledge and institutional practices as socio-historical construct, which operate as means of creating, maintaining, and legitimating power (Edwards 1996).

Place is bounded not a closed entity and does not exist in isolation from the rest of the world. Massey’s (1996) conceptualizes place as a progressive entity with open boundaries, which emphasis on the social and cultural heterogeneity of a place that are continuously reconstructed.

A fresh understanding of ‘place’ is a beginning. To conclude, the suggested re-conceptualization of place in DGNR is best captured by Williams et al. (2013) as follows:

“In more comprehensive sense the term (place based conservation) reflects three broad, interrelated changes to conservation practice relative to classic multiple use management, which predominated over most of the twentieth century. First it involves the shift in the framing of analyses from non-spatial modeling of the production of resource commodities to multi scale modeling of complex, social-ecological system dynamics,.....second it involves a shift from largely top down, expert driven decision-making structure to polycentric

governance emphasizing inclusiveness and collaboration.....and third, place based conservation encompasses wider conservation of local knowledge and historical, cultural and symbolic significance of places, emphasizing the context within which people derive meaning and identity in their lives.”

In nutshell, redefining the concept of ‘place’ in DGNR would dismantle, many assumptions that undergird current trend of DGNR, few of them are discussed in this chapter. This transformation, is a part of broader agenda to change the relation between state, citizen, and resources, where the state is conceptualized as a facilitator, rather than of owner or/and manager of its people, resources, and their interactions. Fishery resource management, in India continue to be dominated with many such problematic assumptions, mostly drawn from economic and biological models of resource management. In this thesis, I explore potential of the concept of ‘place’, if incorporated into DGNR, for a better implementation of DGNR. The context is Chilika fishery, which have experienced DGNR regime just after the independence of the country with formation of PFCS, as a community level institutional arrangement to manage fishery of the lagoon. Efforts for decentralized governance of natural resources at the lagoon supposed to be rejuvenated with the formation of CDA in 1991; and in post 2010, when efforts are made to strengthen PFCS as CBOs to manage fishery sources of the lagoon.

Chapter 4

An Analysis of State's Interventions in Chilika Fishery, 1959-2015

4.1 Introduction

There is worldwide recognition of need for conservation and sustainable management of natural resources, especially the state has a vital role in the management of natural resources. The state is perceived to have ownership, control and perhaps access over most common resources, such as forests, wildlife, water, and fishery. There is growing documentation that state's interventions are disrupting local human-nature relationship in numerous ways, thereby reducing resilience, producing inflexibility that ignores underlying socio-ecological changes, and resulting in crises (see Holling and Meffe 1996). Often, the state and the locals disagree on the question of how natural resources should be managed (see Akama et al. 2008; Lepp and Holland 2006). Strategies for NRM advanced by the state are seen as an agenda for appropriating conservation goals, to increase authority, regulation, and monitoring of peoples relations with natural resources (Neumann 1997). The state policies often disenfranchise the local, and consequently abolish local practices, which to begin with are found to be relatively sustainable (Peluso 1993; Bosak 2008). State is also found to be incompetent manager of natural resources, because the interventions are susceptible to misappropriations due to unequal power structure (Bardhan 1990; de Souza 2010).

DGNR aims to revive traditional systems of community based natural resources management (CBNRM) as a wayforward for conservation and development through participation of locals. Many reforms were brought into the relationship among state, locals, and natural resources. Changes are often structural, as new institutional structures are formed to manage human-nature relation at local level. In fishery, formal introduction of DGNR is late, as the realization of need of conserving fishery resources is a very recent phenomenon in India. Local communities have been governing common pool fishery sources, such as sea, river, lake, and wetland through

their customary institutional structures (see Berkes and Folke 1998; Bavnick 2011; Martin et al. 2007). In the early seventies, across the globe and very recently in India, depletion of fishery, increasingly become the concern of the state (Young 2001; Sugnan 2000; Sutaria 2009). Impacts of depilation in fish stock on the coastal fishing communities were widely documented in terms of food insecurity, livelihood, over-exploitation, unsustainable fishing practices, occupational displacement, and many other (Allison 2001; Coulthard et al. 2011; Bavnick & Johnson 2008; Bavnick 2001). Productivity of small-scale fishers are falling at a phenomenal rate, across the state, and state promotion of commercial fishing are often blamed for this (see Krishnakumar 2014; Devaraj and Vivekanandan 1999). Policy makers and social scientist have shown an increasing interest in the community-based management of fishery sources (GoI 2001; Berkes et al. 2000; Berkes 2003). There is no doubt that, DGNR has potential for better conservation of natural resources, including fishery. However, as we see in the third chapter, improving implementation of DGNR to is a challenge. DGNR in Fishery sector is taken as context to cast light on various aspect of implementation of DGNR.

The state has played a pivotal role in shaping the Chilika fishery. In Chilika Fishery state is the owner of the lagoon, and fishers of 140 fishing communities living in and around the lagoon enjoy exclusive fishing rights over the fishery resources of the lagoon. Chilika fishery from the very beginning has been governed by fishing communities. However, interference of state has increased, especially during 1980s and afterwards.

In this chapter, I have revisited various state initiatives in Chilika fishery, from post-independence period up to 2015. Government documents are the major source of information on fisher policies at Chilika. Information collected through Interviews of officials, observation, and archival research is used to substantiate information collected from policy documents. Assessments of implications of state's initiatives are made based on empirical data collected from seventeen fishing villages located in and around the lagoon. A discussion is followed by to understand the failure of the state in managing fishery sector of the lagoon. In nutshell, this chapter traced the role of the state in Chilika fishery. However, the chapter does not claim to have

comprehensive or a complete presentation of state's role in Chilika fishery, rather it contains a selection of stories, which illustrate some important aspects of state's understanding of Chilika Fishery. At the end the Chapter is concluded by flagging on the need of a reflexive understanding of state practices and local practices. In the next section, I start with a brief introduction to Chilika Fishery.

4.2 The Chilika fishery: A brief introduction

Situated between 19.30 to 19.57 degree north latitude and 85.5 degree to 85.29 degree east longitude Chilika is the largest brackish water lagoon in India and is situated on the eastern coast of India in the state of Odisha. The lagoon for the local people is a source of livelihood, and their cultural, religious, and spiritual activities (see Ghosh et al. 2006; Mohanty 2013; Nayak 2014; Panda 1934, 1977; Jena 2006). Beyond the local communities, the lagoon's rich aquatic life is ecologically very important to its catchment areas. According to CDA in the year (2013) an estimated 140 traditional fishing villages, in and around the lagoon, consisting of 16,710 fisher families with a population of 103,454 have their livelihood depending on Chilika fishery (CDA 2013). As estimated annually, around Rs. 23 corers to the revenue of the state as foreign currency, is accrued from Chilika Fishery (Mohanty 2013).

The state took possession of the lagoon after the independence. Chilika Fishery in the pre-colonial and colonial period had been governed under the *Jamindari* system (see Panda 1977; Das 1993). The traditional caste-based community organizations, such as, *Desh* and *Gramasabha* were managing fishing practices in the lagoon by paying taxes to either princely states or *Jamindars*. Since independence many initiatives have been taken by the state to manage the lagoon and fishery resources. The lagoon has been severely exploited for resources during post-1980 period, when the trend of commercialization and liberalization was at a peak. Later after the lagoon was identified as a wetland of international importance in 1981 under the Ramsar Convention, many efforts were made to conserve the lagoon and fishery resources. The Government of India (GoI) have selected the lagoon in 1981 for intensive conservation and management. Presently, the government of Odisha is planning to recognize the lagoon as a world heritage site.

Given the significance of the lagoon, understanding the social and ecological dynamics that impinge on Chilika fishery is therefore of importance. I begin by detailing the unique ecological dynamics.

Ecological aspects of Chilika fishery

Fishery and hydrology of Chilika lagoon is a product of ecological dynamics the stream of inflows of water, especially from 52 rivulets and the outflows to Bay of Bengal. Construction of dam and deforestation in the catchment area of the lagoon; introduction of aquaculture; facilitating mechanization of fishery; tourism promotion; and the opening of new mouth are some of state's intervention which, continually is shaping and reshaping hydrological dynamics of the lagoon. The lagoon is usually spread over an area of around 1000 sq.kms (CDA 2008). As stated in many interviews the actual areal coverage used to be much more of its present area. The widespread agricultural land in the eastern shore of the lagoon are reported once to be part of Chilika, later in 1980's after aquaculture was practiced, many embankments were constructed and shallow land was converted into ponds⁴⁵. Similarly, many agricultural fields were also converted into aquaculture pond (see fig 4.1: Agricultural field transformed to pond for prawn culture and infertile land). Chilika is a shallow lagoon with an average depth of 2.5m. During 1990s siltation in the lagoon was aggravated due to blockage in outer channel which had reduced efflux of water and silt from the lagoon. Consequently, ecological characteristics of the lagoon and the fishery were negatively affected. The total number of species has declined, similarly the quantum and size, of species, especially of economically valuable species is declining (JICA & CDA 2009b). It is estimated that in the lagoon, there are 158 varieties of fish and prawn species, and of these 27 are freshwater, 13 are saltwater and rest are brackish water species (CDA 2014a, 2015).

There is relatively less documentations in English language about the nature of fishery in the lagoon in the pre-independence period. However, there is vernacular

⁴⁵ Gola, a fishing village chosen for my field work is a bright example of how their traditional source of fishing were converted in to low laying land mass, and aquaculture pond. Their fishing area which used just next to their village, have moved to three km away from the village, adding many issues to their fishery, such as, incidence of theft of their fishing traps, encroachment, increasing cost of fishing, and marketing.

language literature describing life of fishers, beauty of the lagoon, and importance of lagoon for marine trading and so on (see Panda 1934). Both fishery and non-fishery policies seems to aim at generating revenue from the lagoon. Many of the interventions however, resulted in undesirable socio-ecological problems for the lagoon and its fishing communities. For example, there is a rich documentation, by both state and non-state agency, on the negative implications of aquaculture on the ecology of the lagoon. Similarly, state's attempts during the late 1990s to restore the ecological health of the lagoon, to increase the aggregate quantity of fish catch has been achieved through opening of the new mouth, which masks over-exploitation of the resources (See CDA 2008, 2010, 2011, 2012, 2013a, 2014a, 2014b, 2015). Studies have documented continued shrinking of fishing area, decline in the depth of the lagoon. For instance, Nayak (2014) has documented how the opening of new mouth has adverse impacts on fishery sources and fishing communities, similarly, increasing siltation, fluctuation in salinity, decrease in the quantity and variety of fish (see Pattaniak 2007; Samal 2002; Nayak and Berkes 2009, 2011; Mishra and Griffen 2010).

The lagoon is divided into four hydrological zones- northern sector, southern sector, central sector, and outer channel area. The hydrological zones differ in the degree of salinity, siltation, and nature of species availability (Fig 4.2 shows four ecological zones of the lagoon) because of variation in influx and efflux of fresh and saline water, which is determined by the position of the sea inlet (CDA 2008). For example, opening of new mouth has a greater implication on outer-channel areas. Similarly siltation, the decline in salinity, and weed invasion in the northern sectors is very high due to the influence of heavy influx from river Daya and Vargabi. Not only the ecological characteristics but the socio-economic characteristic and issues in these four ecological zones also vary. For example, issues of destructive fishing practices are much higher in the eastern coast of the lagoon, which is dominantly inhabited by non-fishing communities⁴⁶.

⁴⁶ Fishery officers, Dr. SK Mohanty and Dr. Bhatta of CDA during our discussion on the issue of prevalence of aquaculture in the lagoon, explained that fishing sources in outer channel are more fertile for culturing prawn and relatively small number of fishers inhabit in this part of the Chilika. Many fishing communities living in other part of the lagoon have their traditional sources in outer channel. Non-fishing communities take advantage of this locational dynamic of Chilika fishery and illegally posed fishing sources of other and use for culturing prawn.

Socio-cultural aspect of Chilika fishery

Fishery practices at the lagoon are also influenced by many socio-cultural dynamics. At Chilika, the spatial and temporal distribution of fishery sources of the lagoon was linked to the caste system. There are seven sub-castes among fishing communities of Chilika, namely, *Nolia*, *Kanadara*, *Koratia*, *Keuta*, *Khatia*, *Tiara* and *Liari* (Table 4.1 gives the characteristics of the each sub-castes of Chilika fishing communities). Traditionally, each sub-caste has their own organization, i.e. *Desb*, which regulates their socio-cultural practices such as mirages. *Desb* plays a major role in the distribution and managing of inter and intra *desb* conflicts regarding fishing sources. Fishing villages in and around Chilika are generally inhabited by a single sub-caste, and use traditionally fishing sources as community resources.

Table 4.1 Traditional fishing practices

Sub caste	Traditional traps	Characteristics
Keuta	bahani (fishing by net) (Fig 4.3)	Constitutes majority among fishing communities of the lagoon and live all around the lagoon. There are four categories of Keuta: <i>Halua kenta</i> do fishing using boats, <i>Bilua Kenta</i> have agricultural land and also do fishing using nets, <i>Chudatia Kenta</i> depends up on selling of flatten rice which they prepare from rice, and <i>Kaibarta</i> do not fish and depend upon boating.
Kandara	dhaudi, and tata (Fig 4.4)	Constitute 14% of the fishing population, socially untouchable and come in the lowest of caste hierarchy of Chilika fishing communities, follow <i>Vaishnaba</i> religion, and fish in shallow water of the lagoon.
Tiara	baja (Fig 4.5)	Constitute 7% of the fishing population. Use <i>Baja</i> to catch fish and prawn. Some do farming.
Nolia	Drag Net (fig 4.6) and Cast Net (Fig 4.7)	Around 7% of the Chilika fishing community. Immigrated from erstwhile Andhra Pradesh, who are Telugu speaking fishermen, and most live on the outer channel. They are fishing both in Chilika lagoon and in the Sea.
Bengali Refugee	suti (Fig 4.8)	Live near Balugaon town, and most are migrated from Bangladesh
Khatia		Traditionally they don't fish, but depend upon selling dry fish. Few do farming. Currently they do fishing using <i>kbanda</i> .
Liari		Do not fish, collect fish from Kandara and Keuta and sell in and around the lagoon. They also produce flattened rice and sell

Sources: Nayak 2014 and Panda 1934

Traditional spatiotemporal distribution of user rights to fishing sources had limited over-exploitation of fishing sources and, encouraged sustainable fishery management (Samal 2002; Sekhar 2004; Iwasaki and Shaw 2009). Traditionally, except *Bahani*, fishing was allowed only for 5 to 6 months periods in a year, and these practices facilitated un-restricted movement of 80-85% of fish species between Chilika and the sea (Mohanty 2013).

By 1990s traditional fishery management practices declined and, *desh* remains as an institution of kinship. Caste based distribution of fishing traps had ceased entirely and fishing traps are used according to their will and convenience irrespective, rather than of the ones that belongs to their sub-caste.

Traditional methods of fishing and the tools that were used for fishing have transformed, especially after introduction of nylon nets and motorized boats, and changes in fishing sources after the blue revolution. Presently there are 12 methods of trapping in Chilika, which are mixed of traditional and modern. These methods includes; *dhaudi* (fig 4.4), *baja* (fig 4.5), *fasha* (fig 4.7), *suti* (fig 4.8), *banishi* (fig 4.9), *poluha* (fig 4.10), *khanda* (fig 4.11), *Jana* (4.12), *peleka* (fig 4.13), *kankada khanda* (fig 4.14), *gheri* (fig 4.15), *khainchi*, and so on. Among these traps, *khanda* is widely used by most fishing sub-castes of the lagoon. Traditionally, communities used to construct their own fishing gear and traps using bamboo splits, straws, and other organic materials. But over the years traditional tools used to trap the fish has been replaced by nylon nets, zero nets, and disco nets.

Besides changes in the types of nets to trap fish, intrusion by traditionally non-fishing communities⁴⁷ has become an issue of concern to Chilika Fishery. This has been documented by the Dash committee (1993), where it is noted that non-fishing communities were fishing for subsistence only. In 1980s, open auction of fishery sources was introduced and later 30% of culture sources were reserved for non-fishing communities. This worked as incentive for non-fishing communities to choose fishing

⁴⁷ In Chilika, fishing was traditionally a caste based occupation. Only fishing castes of the lagoon were enjoying their exclusive right to fish in the lagoon. Other castes people were not fishing in the lagoon, also partly because fishing used to be regarded as a low occupational hierarchy of caste system. In this thesis, non-fishing communities are refers to all other castes except fisher castes in and around the lagoon.

and especially aquaculture as an occupation. This change accelerated use of nylon net, because fishing was lucrative. As a result non-fishing community in large numbers opted for fishing in the lagoon.

In Chilika good quality fish is caught, which fetches high price and is therefore a source of livelihood for fishing communities and a source of revenue for the state. In the year 2013-14 the total fish landing from Chilika was estimated to be 7,699 MT (CDA 2014).

Transformations that happened to Chilika fishery, especially after 1980s, are drastic. Earlier due to lack of marketing facility and preservative technology, people used to sun-dry their fish catch before selling in the market. Fishing communities were paying royalties to *Mahazan* or *Zamindar* and princely king, who were 'owners' of the lagoon. The colonial state introduced export of dry fish, developed connectivity, and introduced co-operative society for organized exports of dry fish⁴⁸. The lagoon came under the 'possession' of the state after independence, which continued transformation of Chilika Fishery.

In section below I discuss role of state in shaping and reshaping the fishery of the lagoon.

4.3 Chilika Fishery Policies: Tracing state's understanding of human-nature relationship⁴⁹

After independence, the ownership of Chilika was with the government of Odisha and between the years 1953-59, the fishery sources were leased out through open auction by *Anchal Adhikaris*⁵⁰. Most of fishing communities of the lagoon were participating in the auction of sources, which are called as *Sairat*. The auction occurs every year on a specific day only, and the day is called *Sunia*.

⁴⁸ This information was provided during a conversation with two fishery experts at CDA on 3rd May 2014.

⁴⁹ Discussion on this section is based on information gathered from various sources, such as state offices, libraries and archives. Newspaper and magazines are also accessed to fill information gap.

⁵⁰ The revenue officers of Ganjam and erstwhile Puri District are the authority to auction fishing sources of the lagoon.

The *sairat* management of the lagoon was changed in Chilika Reorganization Scheme (1959) by giving ownership of Chilika to the state and the users right on fishery resources to fishing communities. Further, the state government was directed to constitute cooperative societies to better marketing of fish catch. This is because poor marketing of the fish catch as cited as among the reasons for poverty among fishing community, and hence the aim was to facilitate transport of both dry and fresh fish to other parts of the country. Consequently, a dual cooperative structure was introduced. Primary Fishing Cooperative Societies (PFCS) were introduced at the community level and Central Fishery Cooperative Management Society (CFCMS) at the apex level. The system placed was CFCMS leases fishery sources from the revenue department of the concerned district, and then sublease the same to PFCS.

Nylon Filament *or* Net was introduced to Chilika in the late 1970s by fishers in the Northern sector of the lagoon, which gradually spread to other zones of the lagoon. Later introduction of Nylon filament net led to replacing traditional traps of *baja*, *dhaudi*, and *jana* by *kbanda*. Now *kbanda* made of nylon filament allows fishers to place their net for the entire year, where as the traditional traps were used only for five to six months of a year. *kbanda* however, are restricting the inflow and outflow of river water and fish as well which is a major reason for siltation (CDA 2008). The nylon nets have also facilitated introduction of aquaculture.

In the late 1980s, blue revolution⁵¹ was spreading all around the world, especially in Asia and Latin America, because of the potential for earning high profit from the export of shrimps (Coull 1993; Moss et al. 2001; Ahmed 2010; Naylor et al. 1998). In the late 1980s and in early 1990s the government introduced aquaculture in Chilika as a means of accelerating economic development for poor fishing communities and increase revenue for the state. During this decade the state permitted non-fishing communities to obtain lease of fishery sources, especially for culturing prawn. Between 1988 and 1991, 84 *Dians* and 4 *Jana* sources were leased to non-fishing communities. A total of 1,400 hectare of Chilika in Puri District were leased to Tata in 1988 for culturing prawn. This is a glaring instance of state's attempt to privatize

⁵¹ Blue revolution refers to mean blooming of aquaculture in the water bodies, especially in the coastal areas. In India it has started around 1980s.

fishery sources and to encourage aquaculture in the lagoon. In 1988 to encourage aquaculture the tenure of leasing fishing sources was increased to three years, as against the annual leasing policy. Similarly, price of leasing fishery sources was being increased by 10% for every additional year. By early 1990s, most traditional sources, such as *jana*, *chingudi khati*, and *diana* were converted to culture prawn. Such developments in the Chilika Fishery led to shrinking of area for catching fish and there was loss of rich grounds for spawning fish and prawns, which subsequently affected adversely production of fish from the lagoon. An increase in price for leasing forced the poor among the fishing community to sublet their fishery sources to others, especially to non-fishing communities, merchants, and others. Subleasing of fishing sources is illegal.

Aquaculture adversely impacted both ecology of the lagoon and fishing communities. The area of water spread area of the lagoon had reduced from 906 sq.kms to 709 sq.kms during the summer of 1986 (ORSAC). There was also noticeable change in the bathymetry, salinity, siltation, and weed infestation. There was a 10 fold increase in the area covered by weed between the years 1973 and 1985. The weed and sediment estimated to cover 400 sq.kms of the lagoon reducing the water spread area from 906sq.km to 500 sq.kms (CDA 2008). A survey of the Fauna of Chilika carried out by the Zoological Survey of India in 1985-87 recorded around 800 species in and around the lagoon. The fish production of the lagoon is reported to have dwindled from 8883 ton in 1972-73 to 4273 ton in 1990-91. A survey of Chilika Fishery 1988 identified a series of problems, such as disputes over boundaries of fishing sources, conflicts regarding rights to fishing, discrepancies between the recorded area and the area in actual possession of communities, illegal subletting of fishery sources by PFCS, and intrusion of non-fishers⁵².

Conflicts, encroachment, illegal subleasing, and a shortage of working capital weakened PFCS. Between 1988-91, the CFCMS had subleased 203 fishery sources to 49 PFCS. However, of these 49 PFCS that had been leased, 42 PFCS had reportedly

⁵² Many stories of encroachment were narrated during my visit to Chilika, Case of Gola will be discussed in latter part of this thesis. Similar case is encroachment of Kandakhai Jana of Ambika PFCS. A news paper dip on this issue can be accessed from <http://www.thehindu.com/todayspaper/tpnational/tpotherstates/fishermenonthewarpath/artide3046924.ece>, on Nov 12, 2006.

subleased their fishery sources to a third party, mostly to non-fisherman (Das 1993). Reason contributed to these issues high capital required for investment, and burden of past indebtedness, which together exacerbates the burden. In the course of time, as a result most PFCs have become moribund, and CFCMS failed to make any headway in better management of the fishery sources of the lagoon. Additionally, increase in initial cost of investment for fishing, especially to buy net, motor, increasing fuel prices, increase in labor costs augmented dependency of fishers on commission agents.

The two decades of 1980-2000, also witnessed a breakdown of law and order situation leading police to open fire. Many acrimonious claims and counter claims of fishing rights, which at times resulted in violent conflicts⁵³. During the decades there was an intensification of unsustainable fishing practices, traditional rights of fishers were usurped by non-fisher and state, and mafias⁵⁴ began to dominate the Chilika fishery⁵⁵. The lagoon was recognized as a wetland of international importance by the Ramsar Convention in 1981 and later included in the list of wetlands selected for intensive conservation and management by the MoEF, India. The Conservation and Sanctuary Committee (1981-1982) on the Chilika lagoon opined that only the government has rights over the fisheries in Chilika. In 1987 the Nalabana island within the Chilika got notified as Bird Sanctuary under the Wildlife Protection Act (1973). Soon thereafter several restrictions on all kind of fishing practices are announced. Sekhar (2004) described the restriction as a reflection of authority's (state) concern towards the protection of the lagoon's biodiversity, which however curbs rights of fishers. My focus group discussions with fishers of 17 fishing villages in and around

⁵³Numerous conflicts occurred between fishing and non-fishing community and among fishing communities over the issue of right to fish and encroachment. At times people were killed; there are reports of burning down villages, and forceful eviction of people from their village. Firing at Sorana in 1999 was one among many conflicts. In this conflict five fishermen were killed on police firing (see Firing: Panel Faults State. The Hindu (July 15, 2007). Accessed from <http://www.thehindu.com/todayspaper/tpnational/tpotherstates/firingpanelfaultsstate/article1873167.ece> on 18th May 2016. Fishermen Reject Probe Report. The Hindu (June 4, 2007). Accessed from <http://www.thehindu.com/todayspaper/tpnational/tpotherstates/fishermenrejectprobereport/article1851618.ece> on May 18, 2016.). Also see The Down to Earth (August 31, 1992).

⁵⁴ Generally *mafia* is the local term that refers to goons. *Chingudi Mafia* are the local name for individual engaged in culturing prawn on fishing sources of Chilika. The reference is because, these prawn culture practitioner often use employ goon, in addition to their economic and political influences to evacuate fishing communities from their traditional fishing sources.

⁵⁵See Mafias rule the Chilika waters in The Down to Earth (October 15, 1993) <http://www.downtoearth.org.in/news/mafias-rule-the-chilika-waters-31560>. s

the lagoon revealed that there are several conflicts between the state's goal of conservation of biodiversity and communities' interest in securing livelihood⁵⁶. During my field work many fishers of the southern sector complained about their fishing boats and traps being impounded when fishing near Nalabana. Furthermore, they narrated, as to how in these circumstances they were forced to depend on commission agents to pay fine and/or bribe to the officials. The state government of Odisha formed CDA in 1991, depend on, as a nodal agency for prioritizing ecological restoration and natural resource management of the lagoon. However, Chilika's being listed in the Montreux Record⁵⁷ in 1993 under Ramsar Convention added pressure on the state government to initiate measures towards conservation of the lagoon. The state government to minimize conflicts over fishing rights, in 1991 devised a new lease policy, in which the fishery resources were divided into two categories culture and capture sources. Additionally, 30% of culture sources were reserved for leasing to non-fishing communities. However, implementation of this policy did not lead to minimizing the conflict or acrimony. According to fishermen in their interviews to me stated that this policy worked as a legal support to non-fishing communities in order to extend their hold on traditional capture fishery sources. Between the year 1988-93, 187 police cases were filed by parties involved in conflicts over Chilika fishery (Das 1993). The data collected by fact-finding committee, from local revenue authorities reported that in 1992-93 the total number of non-fishermen engaged in fishing in Chilika were 71,244. A Tahsil wise breakup of non-fishing villages and population engaged in culturing prawns are as follows: 34 villages with a population of 13,320 of Berhampur, 45 villages consisting with a total population 24,000 in Puri and Krushnaprasad consisting of 75 villages, with population of 33924)⁵⁸. While the culturing of prawn spread all around the lagoon, the intensity of this activity was higher in the outer channel.

⁵⁶ My focus group discussions in the fishing villages of southern zone of the lagoon, especially those who belongs to the *Kenta* community have expressed their difficulties due to restriction on fishing around Nalabana, which is a very fertile fishing ground for these communities. See also Fishermen Demand Restricted Entry in to Nalabana Sanctuary. The Hindu (April 24, 2014) accessed from <http://www.thehindu.com/todayspaper/tpnational/tpotherstates/fishermendemandrestrictedentryintonalabanasanctuary/article3347894.ece>. on May 18, 2016.

⁵⁷ Montreux Record is the register of wetland sites on the list of wetlands of international importance where changes in ecological character have occurred or occurring and predicted to occur.

⁵⁸ From these three tahsil Krushnaprasad and Puri are in the revenue district of Puri, and Banapur is in the district of Khurda.

Many researchers find intrusion of non-fishers into Chilika fishery as the root cause of all these above mentioned social and ecological problems (Das 1993; Mishra 1996). The 1993 Fact Finding Committee while highlighting ecological and social impact of aquaculture, acknowledged the traditional rights of the fishing community over fishery sources of the lagoon. However, the 1994 lease policy downplays the traditional right over fishery sources and instead focuses on identification of no-fishing-zones, the definition of capture sources and culture sources, and roles of fishery departments⁵⁹. Further, the lease value was reduced by Rs. 50 and fixed a maximum area of 1000 acres that can be allotted to a PFCS for culture of fish.

In late 1990s, there were growing concerns over the ecological degradation on the one hand and a threat to the rights of fishing communities on the other. Chilika Maschyjibi Mahasangha⁶⁰ by uniting traditional fisher from all around the lagoon was formed and led Chilika Bachao Andolan. Thirty eight fishing communities of the lagoon collectively appealed to The Supreme Court of India seeking orders to protect their traditional right to fish. In 1996, the Supreme Court of India in its verdict banned aquaculture in the lagoon. However, formal implementation by the state began only in the year 1999 by suspending lease of fishery sources for culture practices and by banning culture of the prawn by orders in 2001. Lured by the high profit generated by culturing prawns, many continued to forcibly occupy fishing sources. Most fishing communities are subletting- some partially and many entirely- to culture fish⁶¹.

Ever since the lagoon was entered into the Montreux record in 1993, the state's efforts to manage the lagoon intensified and concentrated mostly on the ecological restoration of the lagoon. The Chilika Bill 2002, and subsequent amendment in 2003, vested more power to Chilika Development Authority (CDA) for managing the lagoon. In September 2000, CDA opened a new mouth at Shipakuda as per the recommendation of the Central Water and Power Research Station (CWPRS). The

⁵⁹ Revealed during conversation with Adikanda Behera, a former president of Bagdevi PFCS, Gola on 31/07/2015 and also during interview of Dr. S.K Mohanty on 27/05/2014

⁶⁰ *Chilika Maschyajibi Mahasangha* is the union of fishers from in around the lagoon. The union was formed in 90s and was the four runner of fishers' movement against state's reservation for non-fishers in culture source of Chilika, leasing of fishing source to Tata for culturing prawn.

⁶¹ See Fishermen Face Livelihood Threat, The Hindu (Sept 8, 2008). Accessed from <http://www.thehindu.com/todayspaper/tpnational/tpotherstates/fishermenfacelivelihoodthreat/artide1333703.ece> on 18th May 2016.

mouth is 20 kms south from the natural mouth (CDA 2008). The recommendation was arrived on the basis of rigorous mathematical modeling on the influx and efflux of water, and movement of silt to and from the lagoon (ibid). According to CDA, opening of the new mouth and distillation has rejuvenated the lagoon ecosystem, and also increased the quantity of fish catch by facilitating auto-recruitment of fish, prawn, and crabs (see CDA 2009 and 2015). The average annual income of fishers also recorded an increase by Rs. 50,000 (CDA 2008). By the year 2002 the lagoon was removed from the Montreux Record by citing a successful restoration of ecology in the lagoon. CDA was conferred with prestigious Ramsar Conservation award in the year 2002 and Indira Gandhi Paryavaran Puraskar in the year 2002 by MOEF, Government of India.

In October 2006, CDA in cooperation with Japan International Cooperation Agency (JICA) launched Conservation and wise use of natural resources of Chilika Lagoon through Community Participation Project. As a part of this project JICA surveyed fishery resources of the lagoon and drafted a fishery resource management plan document. The project recommended for scientific assessment of fishery resources (carrying capacity, breeding biology, diversity inventory, stock assessment, survey of fishing gear and crafts, and Environmental Impact Assessment (EIA). fishery resource conservation and management (strengthening regulatory mechanism, recovery of depleted fish stock, demarking and protecting eco-sensitive zone, restriction on motorized boat), community participation (stakeholder consultation, mechanism for strong networking with local communities representing all the sectors of the lagoon, dissemination of information on scientific evidence, regulatory laws and rules and new technology, encouraging self-initiated good practices, strengthening PFCS, implementing Centrally Sponsored National Scheme of Fishers Welfare, promoting alternative livelihood, and formation of SHG), and regulation of fishing practices (by registering all fishery boats under OMFRA Act (1982), controlling the number of boat, and evaluating the existing gears and phasing out destructive gears)⁶².

⁶² These information gathered from the three project report submitted by JICA to CDA (JICA&CDA 2009, 2009a, and 2009b)

This is perhaps, for the first time, fishing communities and their fishing practices were surveyed by CDA.

An Integrated Management Planning (IMP) of Chilika Lagoon was formulated by Wetland International-South Asia in 2009, which also incorporated above noted recommendations of JICA. In the plan, recommendations were made for an action plan for catchment conservation, enhancing hydrological regime, maintenance of coastal inlets, and control of invasive species. The plan also recommended protection of fish spawning and breeding grounds and to restricts the destructive gears, crafts, and by-catch. Implementation of provisioning of OMFRA act, 1982, continuation of monitoring the fish stock, training to build capacities, up-gradation of fish landing centers, introduction of cold chain system, promoting diversification of livelihood to reduce pressure on fish resources are some of the many suggestions given in the IMP of Chilika. The plan suggested institutional restructuring of CDA to make its' knowledge production inclusive and interdisciplinary. Strengthening PFCS was also recommended for participation of community in decision making.

These two above mentioned plan documents, emphasized on the need of addressing issues of fishing communities, and their participation. Subsequent majors taken by state in post-2010 period seem to be guided by recommendation of these two plan documents.

In post-2010 period many steps were taken to strengthen PFCS, as a CBO and for integration of PFCS into fishery management of the lagoon. Central Fishery Cooperative Society was formed under the chairmanship of the Chief Executive Officer (CEO) of CDA and Assistant Registrar of Cooperative Societies (ARCS), Balugaon. During the five year 2010-2015, all PFCS and their documents were renewed. Cooperative election was held in 2015 to form Central Fishery Cooperative Societies (CFCS) with representatives of the fishing community. In 2012, state has decided to provide a financial assistance of rupees four crore to 40 PFCS, so that 10 lakh each can be awarded. Latter CDA added rupees 2crore to increase the financial assistance. However, by 2015, the state financed only two crore to 20 PFCS and stopped providing the subsidized loan. Irregularity and misappropriation of this fund

are among many reasons for why state stopped financing⁶³. There are also many instances where the PFCS have either refused to accept, or returned the money to CDA⁶⁴. During this five year, the state also have distributed icebox, solar lantern, bicycle, financial assistance to repair damage boat, subsidized motor for fishing boats, and trained and financed fisher for alternative livelihood. All these fishery development schemes are channelled through PFCS.

In collaboration with NETFISH (MPEDA), CDA had conducted a series of awareness programs for fishing communities from 2010. Under this program every month CDA is training fishers from three PFCS, each for one day. (fig 4.16: training program at a fishing village).

For minimizing population pressure on the fishing resources of the lagoon, under Integrated Coastal Zone Management (ICZM) program, fishing communities were encouraged to adopt alternative livelihood. Many self-help groups were formed and given training, funds to support alternative livelihoods, such as dairy farming, poultry, dry fish business, fish selling, retail shops (4.17: A grocery shop in Mainsha opened under alternative livelihood scheme), and handicrafts (fig 4.18 fisherwomen making door mat after getting financial help and training under alternative livelihood program)

In brief, state's approach towards the lagoon and its natural resources have changed over the time from a production oriented modernized program to conservation. During second half of 19th century in Chilika fishery was dominantly bias towards the maximum extractions of resources for economic benefit in order to increase revenues and improving the economic conditions of the fishing communities. Introducing cooperative structure for managing fishery is among some of the interventions reflecting the ideology. However, towards the end of the 19th century and in the first decades of 20th century, the state seems to have shifted their concerns

⁶³ Narrated during my conversations with officials at various state offices, such as CDA, Bhubaneswar; ARCS, Balugaon; and DFO, Balugaon.

⁶⁴ During a conversation with Dr. S.K Mohanty and Dr. Bhatta on the implementation of the scheme, Dr. S. K. Maohanty revealed that recently a fishing community, which secured the subsidised loan have denied to accept it, because it seems that there is conflict in the community on which 20 fisher should be awarded with the loan. As the *gramasabha* failed to reach at a consensus, the concerned PFCS denied receiving the loan.

toward the ecology of the lagoon. Pressure from international agencies is one among many reasons for this shift in state's attitude. Once the IMP got mandatory in 2009, there was increased effort at making fishing communities a part of resources management. In nutshell state's perspective towards fishery of the lagoon shifted the decision to manage. In nutshell, state's approach towards fishery in the lagoon shifted from economic to ecological to conservation, and more recently to a participatory approach to management of Chilika Fishery. I discuss the assessment provided by fishers in the seventeen villages in and around the lagoon.

4.4 Assessment of implementation of fishery policies

From independence, as we see in the previous section there is increase in the number of policies made by the state. Historically, state's intervention can be categorized into themes, such as reorganizing fishing rights in the 1960s and 1970s, maximizing revenue for the state and income for fishing communities in the 1970s and 1980s, ecological restoration starting towards the end of 1990s, and thereby, restoring fishing stocks, and reorganizing fishing communities for the management of fishery of the lagoon. These interventions by the state have both socio-economic and ecological implications. Though state has documented evidence describing benefits to the fishing communities, independent researchers are however reporting in contrast to these claims. My findings in this research also reveal that the state has failed in many ways to establish a sustainable fishery management system at the lagoon. In paragraph bellow I note how the fishermen view implementation of fishery policies, which have fallen short of achieving their goals but for the reasons that have not been documented.

Reorganizing Chilika fishery: Failure of PFCS

The 1959 Chilika reorganization bill was perhaps the first attempt, in independent India to formalize and set up an organizational structure that will govern relations between state and resource users through PFCS. Leasing is the strategies through which direct relations between fishing communities and state are determined. Through the Chilika reorganization bill of 1959 PFCS were legally recognized as CBO, transferred legal rights of managing the fishery sources from *gramasabha* to PFCS.

PFCS were also established with the intent of linking fishermen directly with the markets, and in process remove roles for middlemen. Dominance of middlemen in Chilika fishery exists from inception, but increased with numerous state interventions, such as the introduction of aquaculture, opening of the new mouth, and subsidizing introduction of new technologies like motorized boat and Nylon Nets increased costs of investment for fishing in the lagoon. An estimated 60% of the annual income from the Chilika fishery goes to middlemen (CDA 2013). Fishing communities of the lagoon are poor and unable to own a boat, net, and icebox. Fishers often borrow money from middlemen to pay for initial investment, as advance payment. In the words of Dr. Mohanty, a fishery adviser of CDA:

“*Bahania* (fishers) fish by using net and the commission agent has caught these fisher folk by their net of finance”.⁶⁵

I found that to varying degrees sixteen communities from the seventeen fishing villages I visited are dependent on commission agents for finance and marketing of their catch. Santinagar Refugee Colony is an exception and marketing their entire fish catch through PFCS. Mainsha is another example where fishers market their fish catch through PFCS, but dependent solely on commission agents for credit purpose. I also found that fishing communities prefer *mahajan* for credit rather than bank or state’s subsidized loan. A fisher explains the preference for *mahajan* as follows:

“They lend us money at the time of our need, even, and often in a daily basis. There is no consistency of income from our catch. Paying back the money also depends upon our catch. We don’t have to pay interest to *mahajan*, however, bank collect interest and there are specific dates for it. We even don’t have time to run to the bank and getting a loan is not easy. *Mahajans* are also from our community and they help us during the time of our need. In returns, it is our duty and their right to get all our catch”.⁶⁶

Beside obligation of loan repayment, many other factors contribute to the dominance of *mahajans* in the marketing of the catch. Perishable nature of fish, distance of market from their villages and fishing sources are some on the inconvenience that are overcome by selling fish catch to *mahajan*. For example, in Gola village, fishers sell

⁶⁵ In conversation with Dr. Mohanty on 07/05/2014.

⁶⁶ Interview with Brajabandhu Jali, Tentuliapada on 15/03/2015.

their catch through auction, because the village is located near to the highway and businessmen from nearby markets come and collect catch from them directly (fig 4.19: is a photograph of businessmen collecting fish from Gola). Similarly, fishers from Arakuda village are able to auction their fish catch because of their good connectivity (fig 4.20: contains photograph of the auction of fish catch at the Arakuda Jetty). However, fishers from the same community that have secured a loan from commission agents have to sell their fish catch to *mahajan* at a lower price than what the auction may have fetched. Dominance of *mahajan* varies from community-to-community, depending on the nature of their source and fishing practices. Fish being perishable needs preservation. Since the quantity of fish catch is less, most fishers seem to find it convenient to handover the fish catch to commission agent instead of spending on preservation and transportation. A fisher from Chandraput describe their dilemma on whether to preserve fish or not as follows:

“Once we go to Chilika, sometimes it takes two to three days to come back to the coast. So it is difficult to market our catch then. There will be boats of our *mahajan* that collect our catch as soon as we fish and we don’t have to worry about preservation and marketing of our catch”.⁶⁷

The dominance by *mahajan* in northern sector is relatively less than those experienced by communities residing in the lagoon and in the outer channel. This is primarily because of the distance the community resides from the market and related facilities, such as storage and preservation facility. Fig 4.21 shows the distribution of various infrastructural facilities around Chilika. Most facilities are concentrated in the northern and western bank of the lagoon, which has contributed to the dominance of *mahajan* in the outer channel area. A fisher from Berhampur explains the cost implication of their decision as follows:

“Market for our fish catch is at Balugaon, which is a 3 hour journey by boat from our village. Additionally the quantity of catch is very less which cannot even support our transport cost. Given the condition we prefer to sell the fish catch to commission agent”.⁶⁸

⁶⁷ Opinion of Purushotam Behera during FGD at Chandraput on 10/03/2015.

⁶⁸ Interview with Pradeep Malik on 03/07/2015.

Similar reasons were expressed to me by fishers from other villages. The CDA and ARCS office have, however claimed that they have distributed icebox at a subsidized rate to fishing communities. All most every household I have visited has an icebox, but they seem to be used for storing for household items, such as rice, clothes, etc. rather for fish preservation. Upon inquiring I found that fishers have purchased the ice box as iceboxes were distributed at a very less price. However, fishers added that:

“I don’t use the icebox because first, there is no readily availability of ice, and the *mahajan* collect fish catch from us, as soon as we reach the coast. We have limited need for ice-box.”⁶⁹

These ice-boxes are however seen to be used by *mahajan* (fig 4.22: Ice box being used at Mainsha PFCS and a godown of a *mahajan* in Berhampur).

The role of *mahajan* in Mainsha and Berhampur differs in many ways despite many similarities between these two villages, such as similar fishing sources and practices, and distance of the village from the market. This is because *kenata* of Mainsha are able to market their fish catch through PFCS but *kebatia* of Berhampur depend entirely on *mahajan* for selling their fish catch. The difference between the two communities is in the workings of *gramasabha*. Unlike other fishing communities of the lagoon *gramasabha* of Mainsha has well managed fishing practices of its villagers, fishery sources, and the relation between fishers and commission agents.

The formation of PFCS, as one can see, seems to succeed in formalizing relation between fishers and the state. However, it failed in its basic objectives of linking fishers with the market. This is because, fishers dependence on commission agent is a function of economic factors, and simultaneously many other factors, such as their social relation, proximity to market, quantity of catch, availability and affordability to preservation and transportation. Formation of PFCS undermined role of other factors rather than that of economic.

⁶⁹ Interview with Dilip Karana, Mainsha on 28/06/2015.

Maximizing revenue: overexploitation, inequality, and marginalization

The state in Chilika fishery seems to be predominantly concerned about maximizing the quantity of fish catch by increasing production and demand of fish caught from Chilika as a way to raise the economic standards of fishing communities. The value of Chilika fishery from the very beginning has been measured in terms of the economic contribution. Open auctioning of fishery sources, introduction of nylon net, and promotion of aquaculture are some of the initiatives of state focusing upon maximizing revenue from the lagoon.

While market instruments were being applied to manage fish resources, reports of conflict also began to be reported. For instance, open auction of fishing sources, allowed to participate and lease fishery sources of the lagoon. However, violation of rights of fishing communities began to emerge from fishers that were traditionally enjoying an exclusive right to fish in the lagoon.

Aquaculture was introduced by the state in 1981⁷⁰. In subsequent years, the state facilitated expansion of aquaculture in the lagoon, by introducing leasing of fishery sources to non-fishers. Tata, a major Indian multinational, was given lease of vast area of the lagoon to culture prawn. This is because the state had introduced auction and leasing system in Chilika fishery but had also reserved 30% of culture sources for non-fishers. Fishery policies introduced in the years between 1980 and 2000 seems to promote aquaculture in the Chilika Fishery. As discussed earlier sections of this chapter, introduction of aquaculture also brought about violent conflicts, marginalization of fishers, inequalities among fishers, and degradation in the ecology of the lagoon. These consequences noted here continue to be felt by fishers all through. The Supreme Court of India in 1996 and the state government of Odisha in 2000 banned aquaculture in the lagoon.

⁷⁰ In 1981 the then assistant Director of Fisheries, M. G. Rao introduced Tiger Prawn to the pond, which were constructed on the bank of the lagoon and given to fishers of Chilika (see The Down to Earth 31st August 1992).

All respondents in FGDs and interviews with fishers and officials noted that aquaculture in Chilika continues in contravention to the order of the SC of India and Odisha government. A fisher from Chandraput noted that:

“We sublet our sources for culture even knowing it is harmful to Chilika and our fishery sources. We are forced to do so, because there is a need for money to pay increasing price of lease to continue right to fish. Additionally, we fought legal cases to secure our fishery sources. Besides that, often it is safe to sublet conflicting fishery sources”⁷¹.

Such articulations regarding illegal subletting were repeated by many in fishing communities of the lagoon. Money raised from illegal subletting allows to pay for leasing price to the state, which increases by 10% every year of the value paid in the previous year, obtained money needed for contributing in community rituals, building community hall and common resting places, and so on. In villages like Chandraput and Gola the communities have used money raised from illegal subleasing to buy land for construction of houses for their growing population. All fishing communities I visited around the lagoon hold aquaculture responsible for low catch and conflicts. Consequently, the circumstances have changed and the practices of illegal subleasing and other have increased. As one of leader of fishing community of Gola explains:

“We are forced to sublet our sources. *Neither* we can invest for prawn culture *nor* without subletting the sources we can pay price for leasing which increases every year. Villagers are struggling to meet the basic expenses of the household. So the burden of raising additional money to contribute for leasing price, and village ritual is daunting.”⁷²

The expenses for fishers towards rituals held in the village are not meagre. A fisher from Mainsha attributes his dilemma as follows:

“We fishers celebrate more numbers of rituals in a year than the total number of months in a year, and some rituals continue for days on. Symbolically, *amara 12 masare 13 paraba*, 13 religious rituals are held in a year. We observe every ritual. For instance, we observe *Jagar* for five days, many people from other villages visit us at this time. Community bears all the expenses of conducting the ritual. Except *Jagar*, every year, there are community feasts and fund for all these are collected from subleasing our sources for *khanda* purpose. Our poverty, however,

⁷¹ Interview with Biswanath Behera, Chandraput on 10/03/2015.

⁷² Opined by Bhagaban during FGD at the village Gola on 05/03/2015.

doesn't permit the luxury of contributing money. By subletting a portion of our fishery sources we secure, the money required and members don't have to worry about expenses in the conduct of rituals"⁷³.

Expenses for legal procedures are also incurred by the community by subletting their sources. Despite widespread awareness in the community about state's ban on aquaculture illegal aquaculture continued in Chilika fishery.

While the rationale for subletting the fishery sources were economic needs of the fishers, the decision to sublet fishery sources does not seem entirely apolitical. Questions arise like; who decides on subletting? How does a community agree to sublet its fishery knowing fully well that illegal practices reduce their fishing area, lead to conflict, and adversely affect the livelihoods?

Besides illegal subleasing of aquaculture, it was observed that there are other ways in which fishery is affected adversely in the lagoon persists through forceful encroachment. *Kandaras* of Gola were deprived access to their fishing sources for years by neighboring communities from Siara and Panashapada, who now control with complete access to have encroached over 3/4th of the total fishing sources. This outcome seems to be linked with the size of the population, location of villages, and strong political and economic factors.

After opening of the mouth, *Nolias* of Arakuda shifted their fishing from their traditional fishery sources to new mouth area of the lagoon, which until then were fishing sources of fishing communities of Shipakuda and Banamalipur. Similarly, there were conflicts regarding identification of boundaries, for example conflict between fishing communities of Mainsha and Berhampur, Mainsha and Alupatana, Parbaitipur and Mirzapur, Satapara and Berhampur have been noted by my respondents. The sources of conflict often seem due to boundary encroachment. Many communities sublet their fishery sources to outsiders to avoid conflicts, and the outsider businessmen, who are often locally referred as *Chingudi mafia* invest money, goons, and political influences to culture prawn in those fishing sources. In Bhubania Jana that they illegally wrested control, for example, a businessman has sublet from non-fishers

⁷³ Opined by Ramesh Kara, during FGD at the village Mainsha on 02/03/2015.

of Panashapada village support in terms of finance, political, and goons and therefore receive patronage against rule of the state.

Aquaculture continues in Chilika despite being legally banned. It contributes a substantial portion of gross value of total fish landing. However, as one can see, income generated from fishery, i.e., from aquaculture benefits outsiders, i.e. *chingudi mafias* and non-fishing communities. Beyond socio-economic implications of aquaculture, the practices resulted in overexploitation of fishery sources.

Ecological restoration: Improvement in stock recruitment and declining catch

Subsequent to aquaculture, there was ecological degradation and a decline in the fish stock of the lagoon. A continuous assessment of the lagoon was carried out by the CDA and the wetland research center. Ecosystem health reports of the lagoon⁷⁴ were produced in the years 2012 and in 2014. The ecosystem was monitored for water qualities, total fish catch, and varieties, which showed a considerable improvement in all the four hydrological zones of the lagoon (CDA 2014). There is monitoring of water quality parameters at the opening of the new mouth besides dredging of the channel, creating restriction on certain fishing practices, and so on. The annual reports of CDA have recorded manifold increase in the total fish catch, ever since the opening of the new mouth, i.e., 1,745 MT in the year 1999-2000 increase to 11,676MT by the year 2009-10. While the aggregate fish landing has increased individual fisher do not report an increase in the catch of fish (fig 4.23 shows the quantity of one day catch of fisher at Gola and Arakuda).

Fishing communities in all the 17 villages surveyed denied any positive implication of opening the new mouth on the quantity of their catch. They

⁷⁴ The ecosystem health report of the lagoon was prepared by CDA by assessing water quality, total fish catch, varieties of commercial fish, bird count, and diversity of other species. Method followed for this study is originally developed by National Centre for Sustainable Coastal Management, Chennai and University of Maryland, USA.

Also see Barik, Bibhuti. 19th November 2013. Chilika in Good Health Says Report. The Telegraph. Accessed from http://www.telegraphindia.com/1131119/jsp/odisha/story_17583606.jsp#.Vzv_7DV97Mw on 18th May 2016.

Also see Chilika Lake Gets 'B' again on Ecological Health Report Card. The Hindu. March 23, 2016. <http://www.thehindu.com/news/national/otherstates/chilikalakegetsagainonecologicalhealthreportcard/article8386662.ece> Accessed on 18th May 2016.

anonymously conveyed that their catch has declined in terms of quantity, size, and varieties.

Fisher's in the outer channel blame location of the new mouth for the decline in their fish catch. All six villages situated in the outer channel found their traditional tools and methods are inadequate to catch fish at the new mouth. Fishery sources of Berhampur, Mainsha, Parbatipur, and Banmalipur after the opening of the new mouth were transformed into sources with high water velocity, and tidal range from relatively shallow and stable water bodies⁷⁵. Consequently, traditional traps and practices became inappropriate for the changing nature of fishery sources, especially in outerchannel areas. In some fishery sources, there is sand deposition, leading to a decline in fishing areas, for example sand deposition in the traditional fishery source of Berhampur and Parbatipur. Many independent researchers have recorded negative implications of opening a new mouth on the total quantity of fish catch (Nayak 2014). Opening of the new mouth on the outer channel of the lagoon compared to other location of the lagoon has greater negative implications. Fig 4.24 shows dried up fishery sources of Parbatipur at the time of ebb in the flows.

While these vilages were reporting negative implication, the impact of new mouth on fishing sources of Nolias of Arakuda and Sanapatana is also for an entirely different reason. Nolias are trained in traditional fishing practices and are equipped to fish in deeper waters, especially at the mouth of the sea. But with the closing of the old mouth, that used to be near their fishing source resulted in a decline in their catch, increased their investment cost as Nolias are either forced to fish in the sea and at the new mouth by paying other communities. This led to outmigration of a large number of fishers from outer channel area and forceed the fishing community to sublet their sources. All the seven fishing communities visited in the outer channel reported decline in the fish catch.

Communities that are living far from outer channel were also not reporting any kind of improvement in their fish landing even after the hydrological interventions. Opening of the new mouth and dredging of the channels have a relatively less negative

⁷⁵ This is explained by fishers form the above mentioned village while explaining their difficulties to fish in their respective fishing sources.

implication over fishing sources in other three hydrological zones of the lagoon. In the northern and southern hydrological zone of the lagoon, fishers find no substantial impact of new mouth, especially as these sources are situated far from the new mouth. Additionally, prawn *gheries*, *kbanda*, juvenile catching, and other unsustainable fishing practices were nullifying, if any, benefits that may have resulted from the opening of the new mouth. As stated by a fisher from Sabulia, a village in the southern zone of the lagoon:

“Even after the opening of new mouth, the sea water does not reach our fishery sources. As a result fish, prawns, crabs, and their juveniles get caught in *gheri*, *kbanda*, placed by other before reaching our fishery source.”⁷⁶

Fishers in southern zone complained about the functioning of Palur canal because *gheri* constructed for prawn culture and embankment constructed by salt farmer obstruct water movement through Palur canal.

After opening of the new mouth state prohibits any kind of complete confinement, and different kinds of nets, such as zero net. There are restriction on fishing during month of October to January at certain areas of the lagoon, such as *Babarnali*, *Magara Munha*, and sea mouth especially during three days before and after new moon and full moon. Catching of certain important species, such as *Khainaga*, *Daanla*, *Vekti*, *Sabala*, *Boraga*, *Elishi*, bellow length of 6 inch, *Kundala* and *Kantala* below 3 inch, *Bagada* below 4 inch, and crabs bellow 3.5 inch are referred as unsustainable to the lagoon and communities are advised not to catch juvenile of these fish. However all seventeen fishing communities visited seems to be not following these guideline. Fishing at the lagoon is mostly indiscriminative⁷⁷. All the communities that are dependent on *kbanda*, the dominant fishing trap of the lagoon, are setting up *kbanda* throughout the year. Closing the distance between *kbanda*, which is not the norm. This is because population that is fishing in the lagoon is increasing and area available for fishing is shrinking. Communities dependent on fishing through net – Keutas and Nolias- are using net of small mesh size to increase their fish catch, to cover the

⁷⁶ Sahadeba Behera, during FGD at Sabulia on 15/03/2015.

⁷⁷ See The JICA report 2009, that shows prevalence of unsustainable fishing practices among all the fishing communities of the lagoon.

increasing cost of fishing and to pay back the *mahajan*. Similarly catching of juvenile, which started with the introduction of aquaculture seems to have become a source of livelihood for a poorer section of Nolia fishing community.

Similarly state's ban on certain area for fishing rarely gets implemented on the ground. To regulate fish catch, and to improve natural recruitment of fishery of the lagoon, areas near new mouth, Nalabana sanctuary, and Palur Canal are declared as recruitment zones for fish and partial prohibition on fishing resulted in the loss of traditional occupation of fishers of many villages. *Kenta* community of the Ganjam district fish traditionally near the Nalabana. A former president of Ambika PFCS, Chandaraput put the situation as follows:

“Nalabana area has been a rich and main source of our fish catch. From generation we have been fishing there. Now state restricts us to fish there, but we have no other way. To secure our livelihood we do fish there even it is prohibited. Many time our boat, net and tools are getting seized. Often we pay penalties and bribe to get back our traps and many times even many of our villagers have lost their boat and traps completely as they fail to arrange money for bribe and penalties”.⁷⁸

The hydrological intervention to restore fish stock of the lagoon seems to have been guided by the idea that a viable fish stock is necessary for a viable fishing community. The hydrological interventions and other fishery conservation strategies of the state resulted in the restoration of fish recruitment process of the lagoon and increase in total quantity of fish landing. The graph of the gross quantity of fish landing from the lagoon, however, has minimal impact on economic development of fishing communities. In most of the fishing villages I visited, especially in the outer channel areas, fishers were dissatisfied and even had opposed the decision on opening the artificial sea mouth. A fisher at Parbatipur noted:

“Berhampur used to be a hub of fish production, however after the opening of the new mouth at least one person from most household of that village has migrated out of Chilika as migrant labor”.⁷⁹

⁷⁸ Interview of Ulasha Behera, Chandaraput on 10/03/2015.

⁷⁹ Group Discussion at Parbatipur, on 04/03/2015.

A decline in fish catch was commonly stated during our discussions. Though the extent and the manner opening of new mouth has increased the total fish landing and impacts on communities varies. The relation between stock recruitment and quantity of catch, and development of the fishing community is not a linear path as assumed by the state.

Stock recruitment models that undergird the decision of ecological interventions undermined the relation between the quantity of fish catch of fishers, with their fishing skills, the kind of traps and tools they use, and the nature of their fishing sources. Distribution of fishery practices, fishing communities, and their fishing sources have evolved through centuries, which seems to be rarely considered in the decision of opening of the new mouth.

Strengthening CBOs: Policies and politics

Though Community Participation Project of 2006 and Integrated Management Planning of Chilika Lagoon of 2009, the state recognizes the importance of community participation. A review of the processes of policy making and implementation reveals that participation of the communities is passive, i.e., only through expert consultation and dissemination of knowledge in awareness program. Officials in their interactions expressed a strong faith in strict implementation of the laws to stop unsustainable fishery at Chilika⁸⁰. The state has always seems itself as the owner-cum-manager of the lagoon, and therefore the community is viewed as a beneficiary or an end user. In the words of ARCS, Balugaon:

“Fishing community has basically no role in planning and policy making, plans are formulated by experts from their knowledge and experiences and PFCS being the basic unit of implementation either receives benefits of the plan or helps in implementing the plan.”⁸¹

Inclusion of fishing community into planning procedure is aimed to happen through CFCS which consists of elected members of PFCS. However, during my fieldwork, I don't see any kind of major influences of CFCS in policy advocacy for Chilika fishery. For example there are committees for deciding the name of community

⁸⁰ In conversation with DFO, Balugaon on 03/06/2014.

⁸¹ Interview with ARCS, Balugaon on 03/06/2014.

to get subsidized loan and fishing equipment; however, it is the ARCS and CDA official who decide it. The decisions are politically influenced and often are exclusionary towards poor. In the words of a fisher:

“No subsidy, no welfare schemes are extended to the poor and weak. They always get appropriated by a few, who have money, power, and information. It is like *Telia mundare Tela* (more to those who already have)”⁸².

Strengthening of PFCS as a grassroots organization for the fishery management has not been realized, instead exist only in the name. My field work suggests that the tasks of cooperative in Chilika are restricted to taking lease of the fishing sources, availing state welfare schemes, and connecting fishing communities with the state, in case of conflicts or to conduct training programs.

In all the seventeen FGD the respondent noted that PFCSs are mere legal formality and *gramasabha* decides on the management of their fishery resources. More often, members of the PFCS are unaware of the basic function of PFCS. This includes at times the president and secretary also unaware. With the fish catch declining, increased uncertainty on fish catch, high cost of investment, poverty, and continuation of the middlemen, lack of effective leadership, and trust within the community, and interference for local politics, all impinge on the functioning of PFCS, at times even paralyzing initiatives of the state.

Stories of appropriation and irregularity were present in every community. There were reports of misuse cornering/appropriating governmental assistance by leaders of PFCS. As a result one of the fishery officers at CDA notes in his interview:

“Though we are working hard for the development and conservation of Chilika, but I really don’t see any future for the lagoon. I have spent my entire career in working for the development of the lagoon, but I am very pessimistic while thinking about its future”⁸³

Illiteracy, unaware fishing communities, interference of political interest, irresponsible and unsustainable fishing practices and manipulation of communities’ interest by political leaders are the major reasons attributed by the state for various

⁸² Group discussion in Arakuda on 25/02/2015.

⁸³ Interviewed with Dr. S. K Mohanty on 22/05/2014.

issues of Chilika fishery. However, independent researchers have found existing inequality and faulty intervention of state resulting in unsustainable fishery of the lagoon. This chapter, however, asks a very different and fundamental question of why state failed to understand the issues at its maximum complexity.

4.5 Discussion: Theorizing why state failed at Chilika fishery

There are three major reasons for why the state initiatives failed to achieve their objectives at Chilika Fishery. Those are: state's failure to incorporate indigenous knowledge (IK), misinterpreting value of resources, and homogenizing the fishing community.

Hegemony of state over local

Bringing complementarity between indigenous knowledge and scientific knowledge is one of the objectives advocated for DGNR. However, these knowledges were found to be conflictual by each other, especially on how practices are to be perceived. This disconnect between official assessments and the local understanding on, say, solutions to problem at Chilika fishery. There are numerous debates on the accuracy and efficacy of local versus scientific knowledges. This is because as many researchers have found local environmental knowledge is situated knowledge (Leach et al. 1999; McCright et al. 2006). But, scientific knowledge is generalized, which is produced in the service of biodiversity conservation or fishery management of the lagoon. State, as a result, for example while local aesthetic is viewed by local as valued knowledge, the scientific assumption however devalued the same. Digging artificial mouth at Shipakuda without consulting local fishing communities, despite opposition, is one among the many instances where scientific knowledge dominated and ignored considering indigenous knowledge on the proposed measure/initiatives.

The state fails to incorporate IK, because the governments, which is responsible for environmental conservation and scientific research, is simultaneously playing the role of promoter as well as of beneficiary of such conservative model of economic development (Iris 2003). This is why the state is often found to be a firm believer and promoter of scientific knowledge. The state's attitude towards scientific and non-scientific knowledge is best captured by Ashis Nandy:

“The modern state has established such a relation with modern science and technology that it has now become the major source of the attack on all non-modern system of knowledge”. (Nandy 1993)

In sum, NRM practices of the state seem to separate “local culture” from “local nature” (Saunders 2012). An investigation of functioning of various state’s established institutions, such as CDA, Fishery department, and state promoted institutions like “co-operative society” reveal state hegemony over the local. In most decision-making procedures, participation by fishing communities is nearly absent or minimal. There is no representation of fishing communities in the governing body of CDA and is dominated by representatives of CDA, DFO, and ARCS, who determine functioning of cooperative structures in the Chilika fishery.

In the current strategy of resource management, the state retains all decision-making power, while people at the local level have the burden of the management and implementing the state’s conservation agenda.

Management responsibilities are affixed in distant bureaucracies and not by the community. The fishers are merely consulted by the government, prior to enforcing the regulations. While strengthening of ‘co-operative societies’ and transferring management responsibilities to PFCS from *gramasabha* was initially envisioned, but never was implemented with full force. Therefore, evolution of PFCS as an alternative institutional arrangement resulted in disconnections between official assessments and the local process of resource use. Co-operative societies and gram panchayats became new platforms of political power and thereby affecting the pattern of village leadership and these leaders often found to be more inclined towards state, especially the government than representing the interests of their community.

Valuation of fish and Chilika: Dominancy of market-based approach

The fishing resources of Chilika are valued mostly in terms of revenue generation to state’s GDP, increasing economic status of fishing communities, price of fish at the market, and at times a source of livelihood to the fishing community. Consequently, state’s efforts are concentrated on increasing productivity of the lagoon by increasing viable fish stock and harvesting efficiency. Some of the implications of state’s interventions are measured in terms of total fish production, growth in contribution

to GDP, and value exports. However, literature on natural resource conservation has identified that communities associate natural resources with a range of values, which are because of their subjective experiences, emotional attachments, symbolic meanings, and contribution to formation of their identity (see Riper et al. 2011; Vaske and Kobrin 2010; Webler and Tuler 2001). Communities ascribed values go beyond their economic value assigned in their use. Such an understanding of the locals with natural is perhaps intangible, but these social and cultural values are significant to the fishers (see Pinkerton 2003 and 1989). The predominance of economic value of the resource in the agendas of fishery management results in skewing our understanding on material forms and often placing emphasis on extraction of resources (Gezelius 2008).

Social scientists (Jentoft 2000 and 2003) have long claimed fishermen are born, raised and living in their local communities and this way are enmeshed in cultural and social systems that give meaning to their lives and direction to their behavior. Fishing practices are guided by values, norms, and knowledge that are shared within their community. The dominance of economic value in fishery management therefore reduces village organization as a management institution and potentially weakens their social bonds, traditional values, and sense of social responsibility (de Souza 2010; Hara 2007).

The economically dominated management strategy transformed the fisher from a community being to a selfish, profit-seeking, individual, who regards management system in the opportunistic term (Jentoft 2000).

One can arguably claim that community perspective on fish and fishery sources is far more complex than the state's understanding of 'resource'. Human-nature relations at community levels can be understood in terms of 'reliance' and 'care'; 'livelihood' and 'way of life'; and 'occupation' and 'identity'. Resources may be valued through the everyday experiences of fishers.

Fishing communities: Politics of representation

State interventions in Chilika fishery suggest an emphasis on ensuring fish stock is maintained, which is based on scientific assessment and modeling. Jentoft (2000) notes

that ‘the assumption in fishery makes the community as the dependent variable, and fishery as the independent variable in fishery resource management equation’. This belief of assumptions resulted in measures such as a partial or complete ban on certain kind of fishing traps, and hydrological interventions are some of the outcomes of such believe system.

Traditionally communities however, carry a different characteristic of symbiotic relationship (Hanson 1999; Nayak 2014). Fishermen as community members are found to be mutually dependent and supportive (Berkes 2003; Berkes et al. 2000 and 2001). Communities are not merely aggregate of individuals, that driven by utilitarian motives but are guided by socio-cultural values, such as trust, which depicts the dynamics of Community Based Natural Resource Management (CBNRM)⁸⁴ (Begosis 1995; Basurto et al. 2012). Another group of studies, have found communities embodied with social fissures, conflicts, inequalities, and differential power structure (Ballet 2007). Traditional community organizations like *Desb* and *Gramasabha* were managing fishery sources through a caste system. Many have referred this traditional spatial-temporal distribution system as an example of embodied nature of fishers (Nayak 2014). However, appropriation of those decisions at the community level, as Bourdieu’s noted the social, cultural, symbolic, and economic capital along with habitus would provide a richer understanding of community, village, and place.

To understand the implication of state policies one need to understanding fishing being a caste-bound occupation in Chilika the fisherman panchayats are involved in regulating access to and usage of fish resources, and also who holds what kind of property rights over resources, or who controls fishery at the community level. By asking reflective question the nature of community is spotlighted. In other word we ask; who speaks in the interest of whom, how the decision are made, and practices are shaped and reshaped in the way they are, what are the dynamics that influencing those practices.

⁸⁴ CBNRM appears to be relatively equitable and sustainable that minimize social cost and maximize social welfare basically due to relatively small scale and homogenous nature of the community for easier control of individual behavior and so preventing a particular individual to be anonymous at the cost of the community.

Beyond the mundane, that is, to visits inquiring about welfare schemes, to get a license to fish or renew it, and soon. The interactions with fishers are predominantly one-sided.

Despite their belonging to single caste, seemingly equal accessibility to the resources, and to the *gramasabha* fishers supposed to be homogenous. Experiences of a fisher for getting a license illustrate complexities of local everyday practices. Aviram Behera, the new president of Bagdevi PFCS, Gola has been fishing in the lagoon from last 20 years, but didn't have license for his boat. Several times he visited DFO office, which is 3 hours journey by boat from his village. At last he requested former PFCS office bearer of Gola, and as he was informed his application for license is in process. He put forth the situation as bellow:

“Previously officials were visiting our village to collect license fee for new boat and renewing old licenses. Now, nobody comes. Instead we need to go to offices for renewing our licenses or to get a new license. In those office, however no body listen to us. Traveling often to these offices are expensive and time consuming for poor fisher like us. But those previous leader can do it easily, we request them and pay them, otherwise they don't take any interest to work for us”.⁸⁵

While explaining this, he was repeatedly mentioning that he is a graduate and he understands official language, but still failed to communicate officials. One of my observation at DFO office complement the above experience of Abhiram Behera. One day, when I was in conversation with DFO, one person came to inquire about the status of applications he had submitted before. Applications were for issuing new license or renewing the old one. The concerned officer, with a inquiring voice asked reasons for why those boats were not renewed license for long. He asked the individual to pay for all pending license fee and fine. The Individual however conveyed that he would go back and discuss with concern fisher before taking any decision.

4.6 Conclusion

As one can see in this chapter, the state has intervened in the Chilika fishery in many ways. The chronology of state interventions in the Chilika fishery can be divided into four stages. First there is an increasing emphasis on improving marketing efficiency of

⁸⁵ Abhiram Behera, Secretary Bagdevi PFCS, Gola on 06/08/2015.

fishery communities of the lagoon additionally to increase income and revenue generated. Fishery policies during the 1980s focused on maximizing quantity of catch, efficient marketing, and mechanization of boat and fishing tools. State interventions in the second phase were more in terms of maximum extraction of fishery resources of the lagoon. It's the influence of blue revolution that has already started in other parts of the world. State took many initiatives to reorganize fishery practices at the lagoon which in turn promoted aquaculture. Till the late part of the 1990s, state's conceptualization of Chilika was dominantly economic, for instance, revenue generated for the state and income for communities living around. The major objectives of fishery policies at the lagoon, during this period, had been to increase fish production from the lagoon. Consequently, success and failure of policy implementation were assessed on the basis of market value of the total quantity of fish landing. The third stage of state intervention in Chilika started in the late 1990s, when there was a growing concern about the conservation of the lagoon. Especially, after Chilika registered into the Montreaux record of endangered wetland in Ramsar Convention (1993). Opening of new mouth and the post hydrological intervention period experienced a transition in the state approach to fishery resources management of the lagoon. The transition was from a market-based approach to ecological conservation approach. During these years there is increasing centralization, bureaucratization, and dominance of scientific/expert knowledge in the fishery management agenda of the state at the lagoon. It is only after the 2010, that's is the fourth stage, state has initiated some programs, that seems to aim at incorporating fishing communities into the decision-making procedure. Formation of CFCS, is one among such initiatives.

Changes in rights to fish; changing roles of community organizations; transformation in the attitude of fishers towards the lagoon and their fishery sources; changing nature of the fish and fishery sources; and transformation of the community and the place itself are substantially resulted from state interventions into Chilika fishery. While agreeing with the finding of previous researches on Chilika, in my work I argues that state's failure in natural resource management is not simply because it is manipulated by powerful interests, or badly organized, but also because the way state

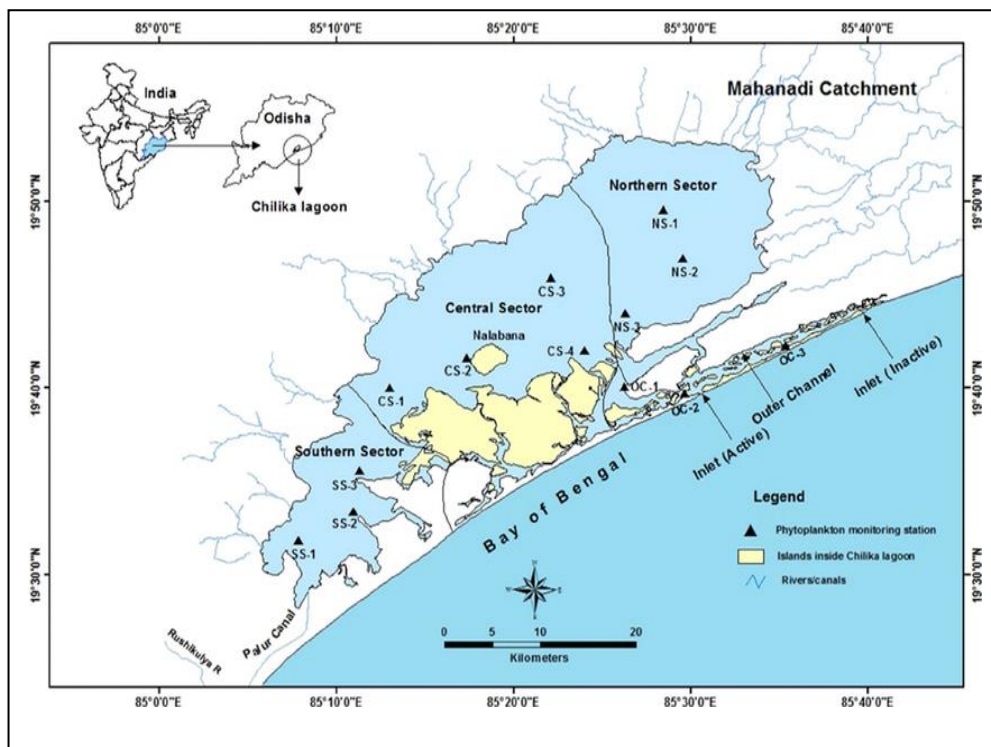
conceptualizes the issues, resources, and community. A review of management programs initiated by state depicts that state understanding of issues of Chilika is still confined to the economic principle and ecological science that sees the unsustainable practice as a product of poverty, inefficiency of the market, and lack of awareness.

The existence of CDA is more likely to promote polycentricity of state managerial power rather than decentralizing management practices. The constituent of CDA and its heavy dependence upon scientific knowledge marginalized and ignore the need of local knowledge to understand human-nature relationship at the field. Other organizations, such as ARCS, FISHFED, and DFO offices are bureaucratic in nature. Such institutional arrangement creates and magnifies distance between community and management of resources at the stake. Such nature of decentralization at Chilika fishery limit decentralization to reduction in the 'scale' of governance and not necessarily guarantee participation, and so the inclusion of local particularities.

Fig 4.1: Abandoned agricultural fields and pond constructed on agricultural field in the eastern coast of the lagoon for prawn culture



Fig 4.2: Four Ecological zones of the lagoon



Source: CDA

Fig 4.3: Varieties of net used for bahani in Chilika fishery



Fig 4.4: Fisher preparing Dhaudi to ship in to their fishery sources, a small *Tata* in the low lying area of Chilika



Fig 4.5: Baja

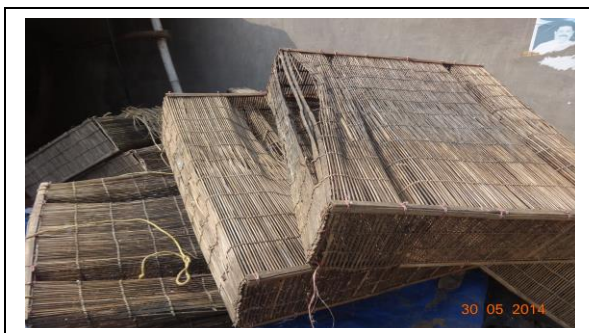


Fig 4.6: Drag Net



Fig 4.7: Cast Net (Fashijala) used by Nolias



Fig 4.8: Dhadi Suti



Fig 4.9: A fisher fishing by Banishi



Fig 4.10: Fisher constructing Poluha



Fig 4.11: A Khanda source at Mainsha



Fig 4. 12: A fisher setting up Jana at Fishing Source of Gola



Fig 4.13: *Peleka*: trap use for juvenile catching



Fig 4.14: *Kankada Khanda* (crab trap)



Fig 4.15: Gheri for culturing prawn



Fig 4.16: Fisher's training programs in fishing villages



Fig 4.17: A grocery shop in Berhampur, opened under the scheme of alternative livelihood



Fig 4.18: Women preparing doormats and other handicraft in the village Gola, trained and financed under alternative livelihood programs



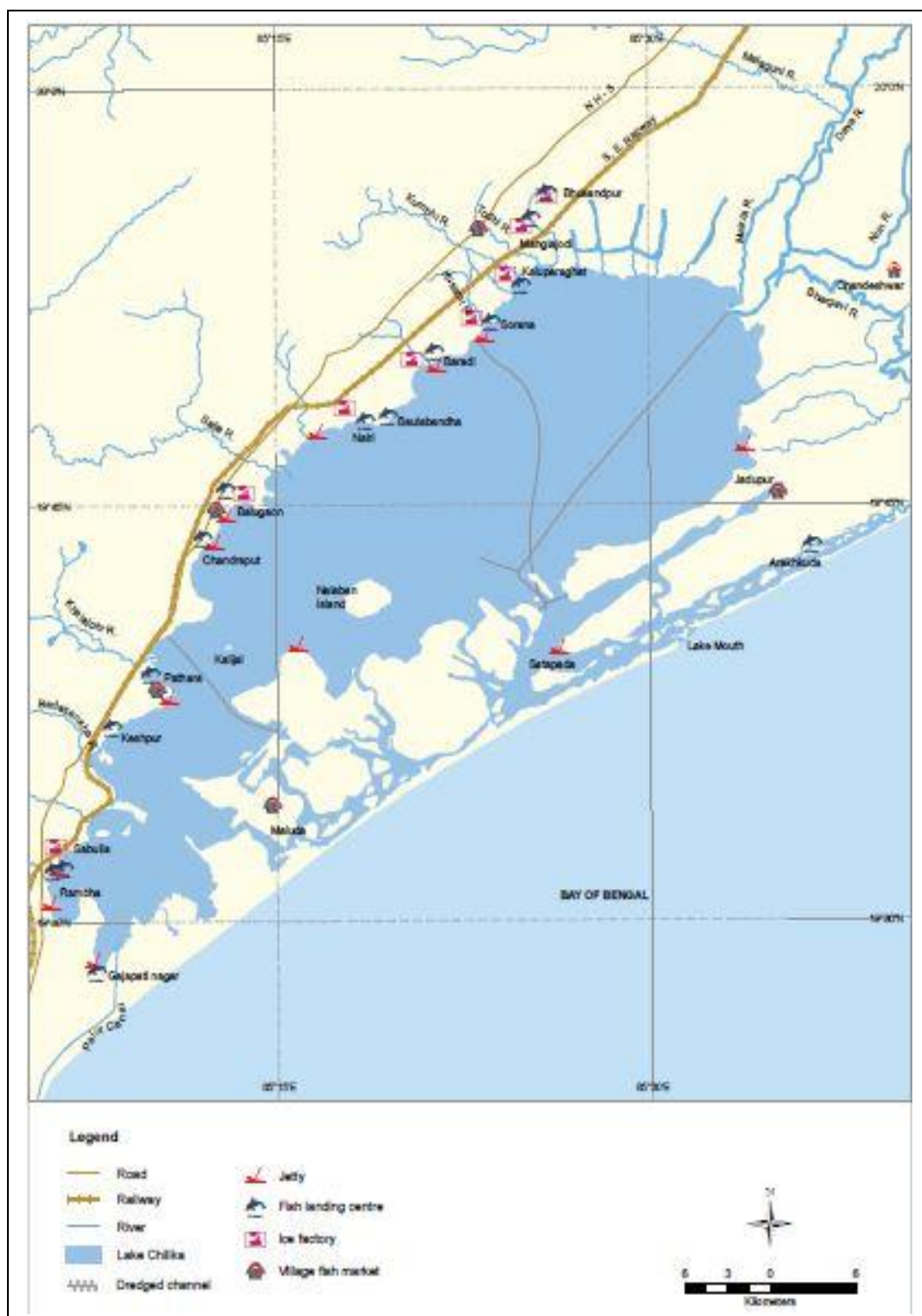
Fig 4.19: Gokhas (who sell fish in the market) collecting fish and crab from fishers of Gola



Fig 4.20: Auction of fish catch at Arakuda



Fig 4.21: Distribution of infrastructural facilities around the lagoon



Source: CDA 2012a

Fig 4.22: Use of insulated ice box in the godown of Manisha PFCS and in the godown of a middleman of Berhampur



Fig 4.23: Fisher with the total fish catch of an entire day

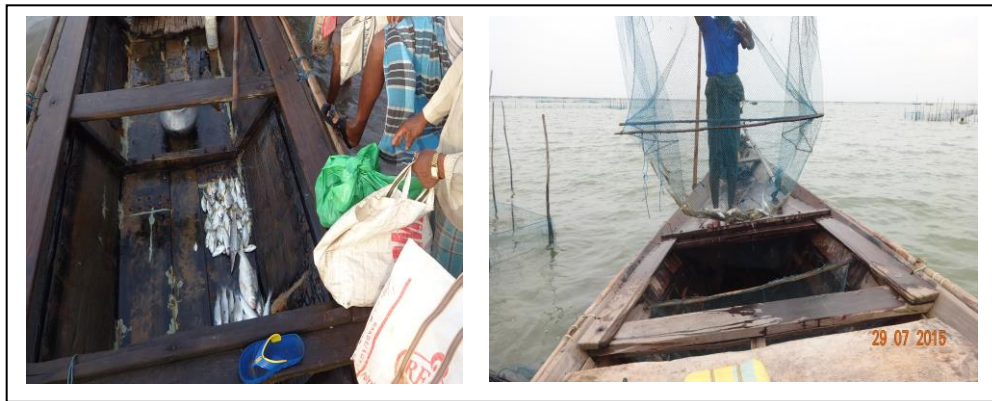


Fig 4.24 Dried traditional fishery source of Parbatipur, due to sand deposition after opening of new mouth



Chapter 5

A Reflexive Understanding to State Interventions: DGNR and Dominance of Scientific Knowledge

5.1 Introduction

In fishery 'fish stock' has always been the core concept on which theoretical developments and empirical studies are carried out (Degnbol 2003). Fishery conservation is therefore centered through fixing quota on catching fish, restricting fishing to certain period of time and place and so on to facilitate stock recruitment. Indian researchers are predominantly obsessed with stock and production dynamics (Sugnan 2000). Very few linkages have been examined that connect fish stock to the life style, customs, and attitude of fisher folk. A few social scientists have pioneered, in recent past, the social, political, and cultural aspects of fishery management (see Berkes 2004; Pomeroy and Berkes 1997; Berkes et al 2001; Subramanian 2009; Caulthard 2011).

State NRM strategies at Chilika, as we saw in the fourth chapter, rely predominantly on knowledge from physical sciences and economics and not surprisingly most efforts by state towards conservation of the lagoon concentrate on restoration of ecological character of the lagoon. Establishing tide gauge stations; opening of the new mouth; renovation of Palur canal; monitoring salinity, siltation, and inflow; regular dredging; identification of spawning and breeding grounds, and periodic or permanent restricting of fishing; monitoring fish migration in the lagoon; and regulating number and nature of boat and other fishing crafts are some of the major technocratic initiatives placed thus far to conserve Chilika Fishery (CDA 2015, 2014a, 2014b, 2013a, 2013b, 2013c, 2012, 2011, 2010, 2008). One can notice quite similar trend in fishery management in other part of the state.

In 1991 the state formed Chilika Development Authority (CDA), as a decentralized institution for natural resources management of the lagoon. Until then, the task of management of natural resources was vested with various departments of the state. Unlike other sector, fishery resource of the lake was governed by fishing communities as community property regime. CDA is an autonomous body vested with

responsibility of managing Chilika lagoon, its ecology and natural resources. As stated in its official website, and also revealed during my interaction with officials, CDA was formed as a nodal agency to manage natural resources through better sectoral cooperation. The premise is that interventions of institutions like CDA, which is established at local level, would deeply address various issues specific to the lagoon. Institutions like CDA, are supposed to preserve or conserve natural resources better, because it was designed to operate at local scale and specific to Chilika. Knowledge produced by such institutions is supposed to understand natural resources issues with its maximum complexity. Opening of the new mouth is one of the most important interventions made by CDA. In this chapter, this particular intervention is taken as a context to reflect on the kind of resource management practices the state is involved with.

Among the several initiatives taken by CDA, opening of new mouth at Shipakuda in the year 2000 has received considerable attentions and accolades. By opening of new mouth, CDA is considered to have saved the lagoon and its fishery⁸⁶ and was conferred with Ramsar Conservation Award and Indira Gandhi Paryavaran Puraskar by Ministry of Environment and Forests (MoEF), India. Opening of the new mouth is claimed to have restored the degraded lagoon, improved bio-diversity in the lagoon, and recovered natural fish-recruitment mechanism between the lagoon and the sea. Opening of the new mouth is also seen as an engineering solution to problems, such as siltation, declining salinity and fish catch. However, there is no consensus on the benefits accrued from opening of the new mouth (see Nayak et. al. 2014; Dujovny 2009).

In this Chapter, opening of new mouth is taken as a case to understand the working of CDA as a decentralized institution for governance of natural resources. As we have already seen in fourth chapter, that the increase in gross landing of fish does not reflect on the quantity of fish catch of individual fisher. In this chapter, I tried to investigate these two seemingly contradictory outcomes of the opening of the new mouth.

⁸⁶ See an interview given by CEO of CDA to S. Mohanty of The Telegraph. Accessed from http://www.telegraphindia.com/1160102/jsp/odisha/story_61632.jsp#.Vzv9GDV97Mw on 18/05/2016.

Multiple claims on the decision of opening of the new mouth and its implication encouraged me to investigate CDA's decision to open a new mouth at Shipakuda, 20 km away from the then natural mouth of the lagoon. Implications of new mouth as one can see, in the fourth chapter, vary in four ecological zones of the lagoon. However impact of new mouth is intense in the outer channel area of the lagoon. For this chapter I have selected four fishing villages, i.e. Mainsha, Berhampur, Arakuda, and Gola for an in-depth understanding of the impact of the new mouth on fishing communities and their fishing sources. Among these four fishing villages, traditional fishing sources of Arakuda is near the old mouth, fishing sources of Mainsha and Berhampur are near the new mouth, and fishing sources of Gola falls near the channel, which was dredged from new mouth to the confluence of river Daya and Bhargabi. The fulcrum of the entire discussion is a deeper analysis of CDA's decision of opening of new mouth. The decision of opening of new mouth, in this chapter, is empirically examined the extent to which CDA has been reflexive in the decision making.

5.2 Opening of the new sea mouth and channels dredged

Chilika was formed 6000-7000 years back by gradual formation of a barrier sand spit,⁸⁷ which separates Chilika from Bay of Bengal. The spit extends over 60 kms from Palur hill to Arakuda. In 1973, there were three 'natural' inlets connecting the sea with the lagoon, facilitating a good influx and out-flux of water between the lagoon and the sea through relatively open inlets (see fig 5.1). However, by the year 1993 two inlets were closed entirely and only one inlet at Arakuda village was functioning. The path between Arakuda inlet and the lagoon was also highly blocked due to siltation and sand deposition. The area, depth, and salinity of the lagoon are continuously shaped by dynamic interactions between influx of fresh water and silt deposition by 52 rivers and rivulets to the lagoon and discharge of water and silt from the lagoon to the sea through its inlet. Tide plays a major role in influx and efflux of water and sediment from and into the lagoon.⁸⁸

⁸⁷ Spit is "a narrow, low lying tongue of sand and shingle, or small points projecting into the sea or across a coastal inlet, and differing from a Bar in that it is attached to the land to one end. It is formed by long shore drift, and it may extend until it become a bar"(Moore 1949)

⁸⁸ Daily there are two high tides and two low tides. During the high tide water level in the lagoon rises but its effects on influx and effluxes is less. Fishers at the time of high tide sail their boats into the lake

Dynamic nature of the lagoon hydrology in many ways shapes fishery resource of the lagoon. Recently inflow of water and sediments from the erosion prone catchment area of the lagoon has increased. Efflux of sediments however, was relatively less, because of the narrow opening of old mouth, sand deposition, and wide spread enclosures (*gheris* and *kbandas*). Landing of fish, prawn, and crab declined steadily after mid-1980s. The highest total landing recorded in 1986-87 was 8872.0 MT, which drastically reduced to 1269.0MT by 1995-96 (is the lowest record of fish landing in Chilika). Decline in landing of fish is partly due to poor recruitment of fish juvenile from the sea to the lagoon due to blockage in migration route. Additionally ecological degradation has reduced species diversity of fish and other flora and fauna in the lagoon.

As a solution, CDA opened an artificial mouth (named as Magarmukh) at Shipakuda village; at a distance of around 20 km from the location of original mouth. A 3.2 kms long channel in Magarmukh and Balugaon direction, and 22.6 kms channel from Magarmukh to the confluence of river Daya, Bharagbi and Luna were dredged (see Fig.5.2). Opening of artificial inlet at the middle of the spit and dredging of channels led to direct inflow and efflux of water rather than through a serpentine route⁸⁹. Opening of the new mouth reduces the distance between sea and the main lagoon from 30 kms to 11 kms. Tide range has increased considerably from 0.60 m before to 1.34 meter in 2008.

Prior to hydrological intervention in Chilika, the ecology of the lagoon was under severe threat due to both natural and anthropogenic factors.⁹⁰ Prior to the year 2000, only 227 species of fish and shell fish were recorded, which has increased to 267 species by 2007. The lagoon got removed from the Montreux Record of Ramsar convention in 2003 due to successful ecological restoration. This minimization of the

and to their village. However maximum water influx and efflux happen during high and low tide of there are two low or high water cycles per lunar day, in every fortnight the tidal range is high leading to highest influx and efflux of water. Tidal dynamics is important for the lagoon as it facilitate maintaining hydrology of the lagoon and natural recruitment of fish to the lagoon.

⁸⁹ The outer channel of the lagoon had developed in such a way, sea water after entering into the lake at Arakuda inlet it was flowing in ninety degree turn and travel for around 30 kms through small sand dunes to reach inner channel, where it again took a ninety degree turns towards north to enter in to the lagoon. Such mechanism slowed down the water velocity in the lagoon.

⁹⁰ Aquaculture is one among the prominent factors contributing for ecological degradation. See the Documentary titled Chilika Jewel of Odisha, <https://www.youtube.com/watch?v=N7WWGflpP4c>.

distance supposed to facilitate recruitment of fish, prawn, crab, and their juvenile to the lagoon from the sea and vice versa. Additionally, it reduces the chances of over catching of species during migration and breeding period. It is recorded that there is expansion of fishing area of the lagoon due to decline in sedimentation and weed infested area. Subsequently opening of new mouth was supposed to have benefited fishing communities of the lagoon (CDA 2008).

The decision of opening of new mouth was taken on the basis of recommendations made by various so called ‘scientific and technical studies’ on the hydrology of the lagoon. CDA had funded no fewer than 25 studies, carried out by many government agencies. These studies, various numerical models, and GIS imagery are used to come up with the decision of opening of the new mouth and its location. As stated by Dr. Bhatta – former Chief Executive officers of CDA, and now working as fishery experts in CDA:

“The old mouth of Chilika played a very important role in maintaining its ecological character. However, shifting nature and narrow opening of the old mouth aggravated various problems, such as siltation, degradation in biodiversity, and declining catch. Monitoring and regulating the nature of the influx and efflux were often offered as solution by many studies.”⁹¹

Similarly Dr. S.K. Maohanty—a fishery expert at CDA, opined:

“Opening of the new mouth was the only solution for the restoration and conservation of the lagoon. Additionally opening of the new mouth has significantly benefited fishing communities in and around Chilika.”⁹²

Ashis Ghosh, an expert on wetland management and member of committee that recommended opening of the new mouth has echoed a similar perspective when he said:

“In post intervention period, personally I have visited fishing communities in Chilika. The quantity of catch has raised, and fishing communities have better living than they used to.”⁹³

Individual researchers and fishing population of the lagoon are not in consensus with the state regarding the impact of new-mouth on the fishing communities of the lagoon. A review of literature however, presents a very contrasting

⁹¹ Interview with Ajit Patnaik, CEO, CDA on 30/05/2014.

⁹² Interview with Dr. S.K. Mohanty on 03/07/2015.

⁹³ In conversation with Ashis Ghosh during a workshop at IDSK, Kolkata, on 14/09/2012.

picture of the influence of new mouth on Chilika Fishery. There are references to loss of occupation, increasing out-migration, and rise in the debt of the fishing community (Nayak et al. 2014; Mishra and Griffin 2010; Dujovny 2009). Nayak (2014) is critical about the location of new mouth. Some of the recorded adverse ecological and livelihood impacts are increase in uncertainty; variability and unpredictability in fish production; change in distribution of salinity regimes; changing nature of water influx and efflux; sand infestation; and invasion of barnacles (*Kastura*). Nayak and Berkes (2010) found opening of the new mouth has led to adding additional investment cost of fishing, consequently led to migration and occupational displacement.

5.3 Implication of the ecological intervention

Despite the sharp rise in the quantity of fish landing in Chilika (CDA 2015), fishermen are not in consensus with the claim of statistics produced by state agencies. Many fishing communities claim decline in the quantity of their fish catch after opening of the new mouth⁹⁴. Fishing communities see state's claim of the rise in fish landing of the lagoon to be dubious and as a manipulative projection by state. Discussion in fourth chapter reveals that fishers from all four hydrological zone of the lagoon rarely perceive any improvement in their fish catch. Opening of the new sea mouth has different impact on the four hydrological zones of the lagoon, depending on the distance between fishery sources and the sea mouth. For instance opening of the new mouth has relatively less or no impact on fishery in the southern sector, which rather more depends on Palur canal⁹⁵. However, opening of new mouth and dredging of channel has immense implication to the fishing sources located in the outer channel areas and in the northern sector, which connected to the mouth by a 22.6 km length channel dredged connecting sea mouth with the confluence of river Daya and Bhargavi. Increase in recruitment of fish stock resulted from this ecological

⁹⁴Chapter four describes difference in the stand of state and fishing communities regarding the increase in quantity of fish landing of the lagoon after opening of new mouth. I have visited 17 fishing communities during 2014-15 and not a single community has the view that they are benefited from the opening of the mouth, and no considerable improvement in their catch was perceived by communities.

⁹⁵Palur canal was dug by Britishers for transportation purpose to link landmass of Odisha with the sea. It works as a recruitment route for fish into Chilika. It is the main source of recruitment of fish to the southern sector of the lagoon. Palur canal also has important role for nearby communities involved in salt production. There are many conflicts on the use of Palur canal for production of salt and fish. Palur Canal was entirely blocked by fishing traps like *kbanda*, and illegal prawn *gheri* restricting natural recruitment of fish stock to the lake.

intervention reported to have benefit fishing communities of outer channel in maximum. Fishers in the outer channel are reported to be able to trap maximum of fish stock, before it reaches other part of the lagoon. As stated by a fisherman from Gola village:

“Juveniles get caught at mouth and rests get captured by prawn *kebanda* and *gheri* at and near mouth. Very little of those reach our fishery sources. As per the fishing is concerned, we don't see any benefit from the opening of the mouth. Our catch continues to decline and our sources continue to get silted.”⁹⁶

Fishers from outer channel, supposed to catch lion share of fish from the lagoon, as their source comes in the migration route. Fishing communities of outer channel, as opined by state officials and fishing communities of other part of Chilika, practice unsustainable fishing, such as use of small size mesh and juvenile catching and in turn nullifying or reducing benefit of new mouth.

My investigation in many fishing communities of outer channel reveals a different story. Fishing communities of villages, such as Shipkuda, Banmalipur, Satapara, Parbatipur were occupationally displaced. These communities are forced to abandon their age old occupation of fishing. In other cases of village Mainsha and Berhampur, whose fishing sources are situated in the migration path of juvenile and mother fish also opined on the decline of their fish catch. Each fisher I have interviewed in the village of Mainsha and Berhampur opined on their declining catch and revealed that opening of new mouth resulted in migration⁹⁷, occupational displacement, and rise in cost of investment⁹⁸.

⁹⁶ Interview with Bhimaraj Behera, Gola on 10/08/2015.

⁹⁷ Out migration from fishing villages in and around Chilika was reported by The Hindu, which stated that fishers from 136 fishing village of Chilika out of 140 villages have migrated see Fisherman Face Livelihood Threat. September 08, 2008. The Hindu. Accessed From <http://www.thehindu.com/todays-paper/tp-national/tp-otherstates/fishermen-face-livelihood-threat/article1333703.ece>. on May 22, 2016.

⁹⁸ Fishers and their family members migrate to far cities like Bangalore, Chennai, Goa and some to Kerala. Migration and poverty induced human trafficking was also reported by many. Cases of death of migrant youngmen suffering from AIDS were also reported. Many stories of channelizing girls to other state for mirage in exchange of money and as manual labor are common stories and can be heard in formal discussions as well as in gossip. In the villages of Berhampur, Mainsha, and Arakuda migration was caused due to and aggravated after opening of the new mouth. However, in the case of Gola, many fishers and their women left the occupation of fishing and now work as daily labor.

Rise in cost of investment

There is rise in cost of bamboo, construction and maintenance cost of boat, price of oil, leading to rise in cost of fishing. Increased velocity and depth of water in outer channel area, additionally raised the cost of investment for fishing in the village of Mainsha and Berhampur, as the changing nature of fishery sources necessitates motorization of fishing boats. For instance fishers of Arakuda have to sail more distance to reach the new mouth and sea, the new area of their fishing. From 60 household I have visited in Arakuda very few own a boat, as very few can afford a machinated or a motorized boat and expensive traps. In Arakuda seven to eight fishers fish in one boat. They work as labor in a boat, which owner give advance of 15 to 20 thousand to each fisher, depending on the skill of the fisher. The source of the money can be traced to larger fisher businessman who invests through local commission agent and owners of fishing boats. Fishing expenses for a fisher of Arakuda has increased manifold, mainly after opening of the new mouth. They sail more distance to reach the new mouth, and to the sea through the mouth and consequently, one has to spend more fuel, time, and money. Additionally they have to pay commission to fishers of other villages, whose traditional area cover the new mouth. Fishers from Arakuda are only allowed to fish at mouth on two kinds of agreement, i.e. to share their catch with fishing communities of the village whose traditional fishing areas are comes under new mouth, or they have to take lease an area for fishing for a certain period of time from the fishes of other community. These are some of the alternative arrangements, which have come up in post-hydrological interventions, which bear consequences such as, increasing dependency of fishers on commission agents. As stated by fisher from Arakuda:

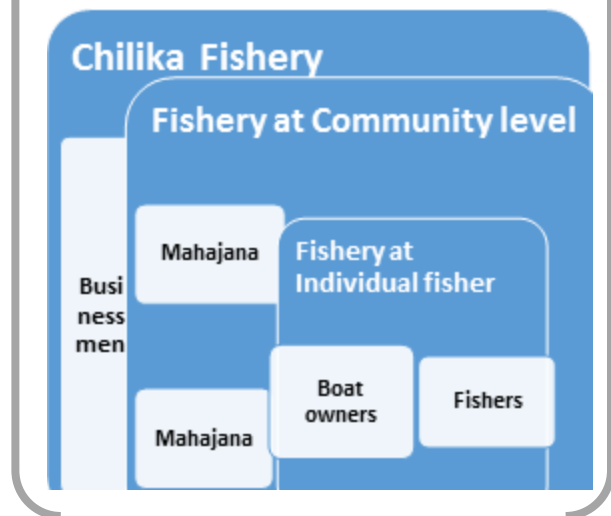
“Earlier, we were fishing in sea only for three months and rest of the year in Chilika. After opening of the new mouth, and decline of catch from our fishery sources we now, depend more on marine fishing. It requires more investment, so more dependency on commission agents. We are in a trap; we catch huge quantity of fish from sea, but our children don’t get a good life. They (commission agents) don’t enter into the water but they live in palace.”⁹⁹

⁹⁹ Interview with Sibram Behera, Arakuda on 09/08/2015.

Expenses for having a country boat range from Rs. 30 - 40 thousand and around 1.5 lakhs for a motorized boat. In case of Mainsha and Berhampur, the increased velocity of water caused due to closeness of new mouth forced fishers to motorize their fishing boats.

In Berhampur and Mainsha, opening of new mouth is also a factor for abandoning of fishermen's traditional method of fishing that was *kbadijala*. In *kbadijala*, a group of fishers run in shallow water, with a net, and surround fish, and catch them. However, after opening of new mouth, increase in depth and velocity make use of *kbadijala* difficult. Additionally, the invasion of *Kastura* has made walking in the fishery sources especially that of Berhampur dangerous as the incidence of *kastura* bites caused lot of pain. *kbanda* has replaced *kbadijala* in Mainsha and Berhampur fishery sources. For setting up a *kbanda*, minimum 20 kg of net is required, which they buy at a minimum of Rs.700/kg. Other traps, such as *patajala* and *fasijala* are more expensive. Traditional traps however, were usually constructed by fishers using local available resource such as bamboo and jute, which were also environmental friendly, unlike the nylon net. In addition to rise in the cost of investment for fishing, decline in catch and uncertainty further degrade the economy of fishing communities and raise their dependency on middlemen. An average account of expenses of a fisher from Mainsha reveals the relation between declining catch, prevalence of commission agents and so also the opening of new mouth:

Fig 5.3 Informal credit chain at Chilika fishery



“In the last fifteen days we¹⁰⁰ have earned Rs. 2 to 2.5 thousand only. I have taken a loan of Rs. 50000/- from commission agent and I pay back by selling my catch to him (the commission agent). After opening of mouth, for eight to nine days of every month our source become unsuitable for fishing. During the time of ebb, a considerable portion of our source becomes sand dune, as water recedes from our source to sea.”¹⁰¹

Declining catch also has negative impact on the business of commission agents and relation between commission agent and fishers. A rise in fishery expenses has led to demand of more money from fishers and decline in catch also forced many commission agents to close their business. For instance, Durjodhan Dash of Gola has left his business of commission agents for the above mentioned reasons. In absence of local finance, fishers from Gola depend on commission agents from Kalupada, a distanced village. In other cases, changing nature of fishing sources has led to increase in the number of commission agents in Berhampur. These varying degrees of prevalence of commission agents are resulted from many more factors, such as location of the village in relation to market and the fishing sources, availability of infrastructure, i.e. transport and preservation, and working of PFCS and *gramasabha*.

Migration

From all the four villages, many fishers have out migrated and many have chosen alternative livelihood. Nayak (2014), found the ‘synergistic impact of aquaculture and opening of new mouth’ as prominent reasons of migration of fishers from the lagoon. The dynamic of migration is well articulated in the narration of an old fisherman:

“We fisherman had never worked under anyone, earning from fishing in Chilika was enough for us and our family. But today, you go to any household, from each family, someone or other left the village in search of work and livelihood.”¹⁰²

Migration of fishers from Chilika is mostly seasonal however many fishers have also left the village and occupation permanently. Migration from Berhampur, and

¹⁰⁰ He fish in partnership with another villagers fish in a *khanda*. In Mainsha one khanda is allocated to four fishers. Each *Khanda* consist of four *khia*, and each *khia* is allocated to a fisher. These four fishers form groups and fish in a *khanda*, and share catch or income incurred from the *khanda*. Many times one or two fishers of the group rent their *khia* to other members for certain specific period of time. In this specific case two fishers of the group have rented their *khia* to the respondent and his partner.

¹⁰¹ Interview with Chita Ranjan Nayak, Mainsha on 23/06/2017.

¹⁰² Interview with Lingaraj Jena, Berhampur on 05/07/2015.

Arakuda is predominantly driven by decline in the fish catch resulted from opening of new mouth. Migration is a negative consequence of outer channel and at the same time has many consequences on the everyday life of these fishing communities. Baidhara Behera, an old fisherman narrates:

“My son has gone out for work. He rarely sends money to us. To earn living for me and my wife, at this age, which does not allow me to go for *Bahani* I am forced to fish. I fish in shallow water of our traditional fishing source and my earning varies from 20 to 100 rupees per day. Today I caught nine prawns which I sold at a total of 35 rupees.”¹⁰³

Migration from these fishing communities is not confined to men; women are worse affected. Declining catch leads to no surplus fish to dry or market, which was mostly the work of fisherwomen. In Gola village, everyday around 7 a.m. a vehicle (tractor) comes to transport women to nearby town for work as construction labor. Fisher women from Arakuda have migrated to far away cities in search of work. Narratives of a fisher, whose daughters have migrated, capture the situation as follows:

“My family consists of six people; me, my wife, and my four daughters. Opening of the new mouth had reduced our catch and Phailin, washed away my house and my boat. For two year, after the cyclone, we struggled for our living without a house to stay. Those days, I was staying under a tent with my family. All my four girls went to some city in search of work (incidentally, name of city is unknown to both the parents) and every month they remit money to us from which I have constructed this house. I had no son, and now have no boat and fishing trap. I work in the boats of other villagers as *bahania*, which is seasonal and gives very less income.”¹⁰⁴

Except migration, occupational displacement is another upshot of opening of new mouth. Titu Jali, a 25 year old fisherman and the only son of a fisher family has preferred to work as daily labor rather than fishing in the lagoon. He works as labor in prawn *gheri* managed by a non-fisher with a monthly payment of 5000. As he put the reason for his decision:

“I don’t fish in Chilika, I have given my *kbanda* for rent at the rate of Rs. 2000 per year. Fishing in Chilika required boat, fishing traps, and other investment. To fish, I have to take loan from commission agents. With declining fish catch from our fishery source, investing on boat

¹⁰³ He is around 75 years and won a country boat of a very small size. Through their traditional method of fishing, he supposed to fish in deeper Chilika, however his advanced age and physical weakness doesn’t permit him to do so. With the help of his small boat he has set up a *kbanda* in the shallow area of the fishing source of his community.

¹⁰⁴ Interview with Surya Behera and his wife Erami Behera, Arakuda on 30/07/2015

and traps, what I feel is foolish. My current job at least guarantees a certain amount of income.”¹⁰⁵

Such dismay is common among young fishers across the lagoon. They found fishing in the lake is comparatively laborious with very little income. Uncertain income and requirement of high investment often discourage fisher to take fishing as a full time occupation.

There is no denial of above mentioned incidents, even by state officials. State perception of increase in the economic standard, in the last one-and-half decade after opening of new mouth is mostly modelled on the assumption that, first the rise in fish landing leads to increase in the quantity of fish catch of individual fishers, and second the rise in market value of Chilika fish has increased the income of fisherman in manifold¹⁰⁶. *Pucca* houses in villages often belong to commission agents, politicians, service holders, petty businessman, and a few to migrant laborers. Increase in gross annual landing failed to reflect on the quantity of catch of individual fishers. State calculations of economic development of fishing communities rarely consider the rise of cost of investment. As argued by a fisher and commission agent of Arakuda that he has rarely seen any change in life style of a fisher. As he states “*Babania* is used to be poor and still continue to be poor.” Several scholars of fishery management have already noted the numerical information on which the state depends for managing fishery is not sufficient. As Wilson and Dickie (1995) suggest policy makers for a ‘parametric management’ of fishery, which looks more carefully towards ‘how, when, and where fish are caught’ rather on how many fish are caught, which is the current management strategy at Chilika Fishery.

In subsequent paragraph I detail down my investigation at the mentioned four villages to understand this contradiction. An in depth investigation was done to understand despite significant governmental efforts how unsustainable fishing practices, such as over fishing, illegal prawn culture, juvenile catching, and use of

¹⁰⁵ In conversation with Titu Jali and his family, Mainsha on 24/06/2015.

¹⁰⁶ A CDA official suggested assessing increasing standard of living through increasing number of *pucca* houses, motorcydes, televisions, etc. However fishers outrightly reject these assumptions by saying that a major portion of their income now comes from other sources, rather than from Chilika. Those who have *pucca* houses are either commission agents, migrant labor, and households that have availed of various state’s welfare schemes.

destructive fishing traps continue in Chilika and how it is linked with the state intervention of opening of new mouth.

5.4 Understanding increase in fish landing and declining catch in Outer Channel

The failure of gross landing to reflect on quantity of fish catch by individual fisher are explained as; first increasing number of fishing population and second unsustainable fishing practices. To reduce the growth of fishing population, the state has encouraged diversification of occupation. Unsustainable fishing practices include use of small mesh size net (*alumijalo* and *patuajalo*), juvenile catching, prawn *gheri*, and setting of *kbanda* in certain areas and for throughout the year. State has taken many initiatives to cease unsustainable fishing practices in the lagoon, prawn culture is one among them. Ban on aquaculture, formation of task force for regular demolition of *gheri*, awareness programs are among many initiatives taken by state to stop aquaculture in the lagoon. Other initiatives to check on unsustainable fishing practices are, directing fishing communities to keep enough passage between two *kbandas* for free movement of water and fish, licensing boats, and putting fine for clandestine fishing practices. Failure of state in implementing these measures is visible with widespread encroachment of *gheri*, use of dragnets of small mesh size, and juvenile catching (fig 5.4: Map showing prevalence of unsustainable fishing practices in the lagoon). In subsequent sub-sections I describe the complex relation of these unsustainable fishing practices, the new mouth, and the issue of fishery resource management in these four villages.

Overfishing

Overfishing in Chilika resulted in overexploitation of stock beyond its level of maximum sustainable yield (MSY). Over fishing at Chilika is substantially contributed due to increase in fishing population and fishing effort. According to a survey carried out in 1957, there were 114 fishing villages in and around the lake inhabited by 31,510 traditional fishers, of which, 8079 were active fishermen. Number of traditional fishers increased to 103,454 by 2009. Similarly, the number of fishing boat has increased from 2360 (617 large and 1743 small) to 7348 (2259 motorized and 5089 non-motorized)

during the period of 1957 to 2009¹⁰⁷. Increasing fishing population and growing number of boat have invaded many fishery sources, which were unexplored in the lagoon (fig 5.5 and fig 5.6 show the expansion of fishing area in the lagoon). Fishers opined that there is not enough fish in the lagoon and reject state's claim of any positive impact of new mouth on the quantity of catch. Fishing communities of Mainsha and Berhampur reject any positive impact of new mouth on their catch. However, these two fishing communities whose fishing sources are located in the migration route of fish, prawn, and crab from sea to the lagoon and vice versa are supposed to get maximum benefits from opening of new mouth. The impact of new mouth on fishing practices of Mainsha and Berhampur was captured by a fisher from Mainsha:

“Our forefathers used to fish by *Khadijala* now we use all kind of traps still catch less. But after opening of new mouth, even we use all kind of traps, spend more time, and invest more on new technology, still we catch far less.”¹⁰⁸

Kandaras of Gola also claim that opening of new mouth failed to reduce siltation and shrinking of their fishing sources and the quantity of their catch continue to decline. Though all four fishing communities have grown in their population, but they also denied state's claim of increase in fish landing.

As I have discussed earlier, many fishing communities in outer channel have migrated and many left the occupation, on the other hand many non-fishers have joined fishing in the lagoon. Increasing number of boat and fishing population in Chilika is significantly contributed by increase in number of non-fishing population rather than natural growth. Such scenario is well expressed by a young man from traditional fisherman family:

“During our childhood, we were able to catch fish. Now even most efficient fishers of our community find difficult to have good catch. As no body from my home fish in Chilika, my family buy fish from non-fisher. They possess more numbers of boats and varieties of traps than any traditional fishers.”¹⁰⁹

¹⁰⁷ Data for Chilika fishery in 1957 was collected from the village Gola, and for 2009 information were collected from a survey report prepared by JICA and CDA in 2009.

¹⁰⁸ Nabaghana Nayak, Mainsha on 28/06/2015.

¹⁰⁹ Interview with Sisira Pradhan, Berhampur on 15/07/2015.

By 2009 there were 42,577 traditionally non-fishers fish in the lagoon. Many non-fishers possess fishing boats and use all kind of traps for fishing. Fishing by non-fishing community in Chilika is facilitated by use of nylon net, introduction of aquaculture, and state policies in 80s and 90s. Abolition of caste-occupation system in Chilika fishery is one among many reasons.

The state believes that the increase in the number of people fishing in the lake has neutralized the benefits occurred by the opening of new mouth. There are many initiatives taken to reduce pressure from increasing fishers' population. Creating alternative livelihood opportunities is one among many such measures. However, such alternatives rarely address the issue of encroachment of non-fishing community. There is a need to examine the nature and cause of over fishing more critically and policies seeking solution for increasing pressure on fishing resources also needs to take care of increasing number of non-fishers¹¹⁰.

Aquaculture

In addition to capture fishing, the presence of non-fisher is more visible in the wide prevalence of illegal aquaculture in and around Chilika. There is a claim that, most of the benefit occurred from opening of new mouth get captured in the prawn field and consequently benefited prawn mafias – a term means the people who illegally sublet fishing sources and practice prawn culture- than fishing communities. Prawn *gheri* in Chilika are predominantly possessed by non-fishers. Despite ban on prawn culture in Chilika, over 5,500 acres of the lagoon is covered by prawn *ghairs*.¹¹¹ Existence of

¹¹⁰ Presence of non-fishers at Chilika fishery is there from the very beginning. Non-fishers used to fish in the lagoon, through small traps, in shallow areas, and only for household consumption. Fishing rights however, was always there with traditional fishers. Encroachment of fishing sources by non-fishing community only started after introduction of shrimp culture into Chilika Fishery. Subsequently with the state encouragement to non-fishing community to involve in aquaculture, the problem aggravated. State encouraged shrimp culture by non-fisher by giving lease of culture sources to non-fishing community. Non-fisherman primary cooperative societies were formed. By recognizing *gramatali* area as the traditional fishing source for non-fisher and reserving 30% of culture sources for non-fishing community, state has strengthen hold of non-fisher in Chilika Fishery.

¹¹¹ As reported by Times of India on 10th December prawn *ghairs* are constructed over 5,500 acres of the lagoon. In Ganjam district Alone there are 50 illegal *ghairs* in Khalikote and Rambha Tahasil of Ganjam district. Retrieved from <http://timesofindia.indiatimes.com/city/bhubaneswar/Drive-against-illegal-prawn-gheries-in-Chilika-soon/artideshow/50118225.cms>.

aquaculture and encroachment by non-fishing community prevail in two ways, i.e., illegal subletting of fishing sources and encroachment.

Nature of encroachment varies from village to village depending on various factors, such as nature of source, distance of fishing sources from the village, and nature of community. Encroachment in both forms either forceful or voluntary has adverse impact on fish resource and fishing communities of the lagoon by squeezing the area available for fishing communities. As a result of subletting a larger area of the fishing sources get possessed by an individual or few individuals (may be fisher and non-fishers). If not sublet, same fishing sources provides livelihood to a larger number of villagers.

Illegal subletting

Voluntary illegal subleasing of fishery sources by fishing communities is very common in Chilika fishery across four ecological zone of the lagoon. Illegal subleasing was in practice in all the four fishing villages. In Arakuda, the previous leader of the village had sublet the most productive part of their traditional fishing source for a leasing price of Rs.12 lakhs. In this leased out area, as told by a fisher, only 10 fishing boats are employed in an area, which otherwise could have source of income for many villagers. Both village Mainsha and Berhampur have sublet part of their fishing sources. Mainsha sublet both for capture and culture fishing, while Berhampur sublet for prawn culture. As the nature of their traditional fishing sources does not allow for a permanent enclosure, setting up prawn *gheris* is difficult in their fishing source, so a relatively small portion of their sources are dedicated for prawn culture. Mainsha sublet its 7 *kbanda* sources for capture fishery. The Kandara community of Gola also has sublet a part of its traditional fishing source for prawn culture to non-fisher *Chingudi Mafia*.

Reason contributed for subleasing of fishery sources are many, such as community expenses, paying lease prices, legal expenses of the community, and expense for community cultural practices. There are also explanations that fishing community illegally sublet their sources for some extra economic gain. No doubt economy plays a major role for illegal subletting of fishery sources. However a closer

understanding reveals that verities of factors contribute for illegal subleasing. For instance in case of Gola, income incurred from subletting fishery sources is used for fighting case against forceful encroachment of their source by a neighboring non-fishing communities. Manisha and Berhampur have sublet their fishery sources to repay the loan they brought during a conflict of encroachment¹¹². Money incurred from subleasing is also used for paying lease price to the state.

Regular increase in lease price of fishing sources, especially when the quantity of catch has declined have forced fishing communities to illegally sublet their sources. Fishing communities of Gola and Mainsha, who take regular lease described payment of leasing price as one of the reason for subleasing their sources. With declining catch, which they associated with opening of new mouth in case of Mainsha and encroachment for aquaculture, fisher expressed their difficulty to share lease price. To avoid this problem many fishing villages sublet their fishing sources.

Money incurred from subleasing also used to pay village office bearer, of village traditional institutional arrangement and PFCS. As stated by the *pradhan* of Mainsha the profit they incur from fish marketing through PFC is very minimal, sometime they run in loss. Many times, village committee has to pay salary of office bearers like *Mukhia*, *Dakua*, *Makadami*, and other villager employed by the community for transporting, selling, and preserving their catch at godown. Auction money from subletting of *kbanda* is used for paying salary.

Expense for community rituals also come from illegal subletting of sources. As stated by a villagers in Mainsha ‘in a fishing village we have many community rituals in every years. *Gramasabha* in those occasions spends huge amount of money. Expenditures are incurred from subletting, so villagers don’t have to pay anything for community function. By doing this, as explained by a fisher of Gola, “fishers are poor; they live in daily basis and often in debt. Given this condition, it becomes difficult for a poor fisher to contribute even if it is as small as Rs.100/ frequently becomes

¹¹²Few years before Mainsha had conflict with its neighboring village of Berhampur and Satapada regarding the identification of boundaries. In that fight few community member lost their life and cases regarding that fight is still in court. Then the community has taken loan for its legal and other expenses. In early 90s when aquaculture was spreading all over the lake Manisha has taken loan to do prawn culture in its fishery source. But, it was a loss and community is still paying that money.

difficult”. For a poor fisher it is convenient to support the subleasing rather paying for common purposes on daily basis.

To understand voluntary subletting, one has to go beyond lack of awareness among fishers. Illegal subletting of fishery sources is very closely linked with political, social, cultural, and economic dimension of the community. The decisions of subletting of fishery sources are made in *gramasabha*. Though these decisions appear to be unanimous an in-depth understanding of the process will explore the nature of the decision. To have a reflexive understanding of this so called collective decision, one need to ask a different kind of questions, such as who take these lease, who takes decisions, how these decision are represented and get collective consensus and many more. This discussion would be part of sixth chapter. However, the major point of this discussion is that, the state understanding of reasons for subleasing, i.e. unaware and greedy fishers stands insufficient, so their policy initiatives like awareness programs and ban on aquaculture yield no substantial result.

Forceful Encroachment

Forceful encroachment of fishing sources by non-fishers is very common in Chilika especially in the revenue district of Puri. The route of forceful encroachment, can be traced back to aquaculture in 80s, state categorization of fishing sources in to capture and culture source in 1994, and reservation of 30% of capture sources for non-fishing communities.

The village Gola among my four cases, is an example of how state failed to stop forceful encroachment and existence of non-fishing community in Chilika fishery. Every year *Kandaras* of Gola take lease of their traditional fishery sources, which consist of three fishing sources, i.e. Bhubania jana, Garadaupara, and Tata tank area¹¹³. Bhubania jana consisting of 649 acres of area is the most productive fishery source. The location of this particular source is suitable for prawn culture and from last one and half decades Bhubania jana is illegally possessed by non-fishing communities of

¹¹³ From the lease record of Bagdevi PFCS, it used to bring lease of more than 6 fishery sources. As stated by an old fisher from Gola latter they stopped bringing such huge fishery area as they failed to give leasing price for all, and fishing area was also becoming large. At present they are only taking lease of three fishery sources.

Panashapada and Kajibhoisahi, the two neighboring village of Gola. The history of encroachment started in the year 2000 when villagers of Panashapada¹¹⁴ and Kajibhoisahi¹¹⁵ asked Gola to leave Bhubania jana to them for prawn culture. As stated by the head of the village of Gola “it was like our rice bowl and so we denied to give them.” The denial led to arm conflict between Panashapada and Gola. On 12th December 2000 night, villagers from Panashapada took forceful possession of Bhubania jana and there were court cases. Following the conflict revenue department stopped giving lease of Bhubania jana for a period between 2002 and 2009. The Revenue District Court (RDC) of Puri, ruled out in favor of Gola¹¹⁶. The revenue department however failed to give possession of Bhubania jana to Gola and the fishery source continues to be with Panashapada. Fishers of Gola moved to The High Court of Odisha. The High court directed collector office of Puri to give physical possession over Bhubania fishing source. Following the direction of The High Court, Odisha (court case no: 1809/10 dated 07/12/11 and 13/12/11) on 09/12/11) the administration gave physical possession to fishers of Gola. Police were employed for protection of fishers of Gola and their fishing sources. As soon as the police forces were removed, the villagers from Panashapada forcefully encroached over it. On 22/12/11 and 18/1/12 villagers of Panashapada attacked Gola and took forceful possession over Bhubania jana. As per mentioned in copy of FIR, 150 *khanda*, 400 bamboo pools, and 40 boats from Gola were taken away by a crowd of 200 to 300 people from Panashapada. In that clash many fishers from Gola were severely injured¹¹⁷ (fig 5.7: A fisher injured by the crowd from Panashapada). The then Human Right Commissioner visited the village and suggested for removal of Panashapada

¹¹⁴Panashapada is a large village of non-fishing community consisting of people belonging to higher caste. At present the village has illegal possession of a large area of Chilika. Though the villagers of Panashapada are not fisherman but a major portion of their income come from fishing sources they illegally possess. Fishery sources under possession of Panashapada are used for both prawn culture and *khanda*.

¹¹⁵ A village consisting of scheduled caste population of non-fishing community. Their village is on the bank of Bhubania jana, this locational closeness supports the community to forcefully encroach over the fishing source of Gola, which is located around 3 km away from the source.

¹¹⁶ The decision of the court was actually driven by ruling of the High court in another case of forceful encroachment in 2009. The High Court of Orissa in a hearing of another similar kind of case i.e. Palasuni PFCS ruled out that law and order situation can't be hold for long time, as these fishing sources are the source of livelihood for fisher folk.

¹¹⁷ As per the report by Gola in a FIR, crowd from Panashapada were equipped with deadly weapons like gun, sword, tenata, vali, lathi, and Bhujali. All these weapons as stated by the villagers of Gola were brought from the income they (Panashapada villagers) got from illegal possession of Bhubania jana.

community from Bhubania jana. The district administration however, failed to comply with the order of both Human Right Commission and The High Court of Odisha. Latter a peace committee was formed between villagers of Panashapada and Gola to solve the issue with mutual agreement. After several round of peace committee meeting decision was made for distribution of Bhubania jana (650 acres) among three village Panshapada (250 acre), Kajibhoisahi (200 acres) and Gola (200 acres). Villagers of Panshapada latter denied going by decision of Peace Committee and continuing to possess Bhubania jana. After decision of peace committee was disobeyed the case went to *mahasamadhana Sibira*¹¹⁸ conducted at the collector office of Puri and there also the hearing come in support of Gola. However, despite all these legal procedure Panashapada continue to possess and fish in *Bhubania Jana*.

Many reasons were attributed for such scenario. Lack of political will is condemned to be one among the main reasons for failure of state to secure fishing right of Kandaras of Gola. As stated by a fisher:

“Panashapada villagers are powerful in the sense of everything. They have political power informs of political leaders and number of vote. They have money incurred from our fishing sources. And their belongingness from higher caste gives them a stronger hold. Additionally to the prawn mafia they sublease the source, support them in terms of finance, man power, and political influences¹¹⁹.”

Money incurred from subleasing are used for bribing the police, bureaucrats, and politicians to influence decision and legal practices; used for legal expenses, to buy weapons, and rest of the money get distributed among villagers. To illustrate how it works, a fisher from Gola gives an example:

“In the last date of our court case, I and one of my friends representing our village in the court, five to six villagers were there from Panashapada as well. The village committee of Panshapada bore all expenses of those people and also pay them wage for that day. Such practices encourage villager to run to offices again and again. All those money are actually ours, earned from our fishing sources. But our

¹¹⁸*Mahasamadhan Sibira* was a state government of Odisha's initiative to solve conflicts and legal issues at the level of revenue district.

¹¹⁹In conversation with Biswambara Das, Gola on 05/08/2015 The Businessmen are often from outside and are very powerful people having lot of money and political support. By using their money power they influence bureaucrats and politician. They also use their money and muscle power in favor lease giving village against fishing villages.

gramasabha could not pay us and we have to go on our own expenses.”¹²⁰

Political support was also described as major reason for continuation of aquaculture in the lagoon. Belongingness of local politician and bureaucrats from non-fishing community, also described as why state failed to implement all the policy made for stopping aquaculture. Adikanda Behera of Gola narrated how political and bureaucratic favor play role in the context of encroachment:

“When in the year 2000, villagers from Panshapada encroached into our source, then the RDC used to be a distance relative of one of our villagers. We went to him, and immediately he order for the protection of our fishery source. But our local MLA who belongs to higher caste blames RDC in assembly by blaming his decision as bias towards us and in few days the then RDC, Puri get a transfer order.”¹²¹

All Political parties support Panashapada for maximizing their vote. Even in Gola there are no consensus regarding the voting practices, while most of elder of Gola prefer to vote for Congress, few youths are in support of BJD. But that rarely help to get support of any political party. In addition to the large number of vote, most of local political leaders -of both party in power and party in opposition in the state belong to Panashapada who use their influence to manipulate implementation of the decision of the state.

History of Bhubania jana also plays major role in Encroachment. Earlier, Bhubania jana used to be a major source of funding for a private college at Panashapada. The college accommodates students from Panashapada and other non-fishing and fishing villages. Committee that used to manage the college was periodically collecting catch from Bhubania jana. As stated by fishers from Gola fish catch of three to four day of a month used to be dedicated for maintenance of the college. At current time, Panshapada College is entirely funded by the state, however in contrast to periodical collection of catch, now non-fishers of Panshapada possess the entire source.¹²²

¹²⁰ Interview with Bhagaban Dasa, Gola on 01/08/2015.

¹²¹ Interview with Adikanda Behera on 02/08/2015.

¹²² There are many story of encroachment of same kind. Knadkhai College of village Baghamunda, is same way related to issue of encroachment.

Late functioning of administrative procedures also contributes to encroachment. For example when I was in field in the month of June it was already a month late from the day of *Sunia*¹²³ and still as stated by the president of Bagdevi PFCS they have not received any lease notice from the administration. As explained by Adikanda Behera, the former secretary of Bagdevi PFCS:

“From my seven year of experiences of being president of our PFCS each year we deposit our lease price but, it is always six to seven month late from the day of *Sunia*. We pay the same amount of money, but we get the legal possession only for a period of three to four month. These delay are intentional, to restricts us from demanding for physical possession over our fishery sources. Consequently, it helps non-fishing community and victimizes us. By the time we get the lease order it is seven month late, rest three-four month we spend to run to administrative offices, and before anything happen our leasing period of one year gets over.”¹²⁴

This kind of administrative delays are often perceived as to be funded by non-fishing communities and prawn mafias. Many incidents were described as how large amount of money were bribed to bureaucrats and politicians to issue lease order as late as possible.

Many initiatives are taken by the state to abolish the practice of aquaculture from the lagoon. One among these is the formation of taskforce to demolish *gheri* and any kind of illegal enclosure from the lagoon. The next section reflects on the implementation of those initiatives.

Failure of gheri demolition

Except ban on aquaculture demolition of prawn *gheri* is another initiative that failed to remove *gheri* from Chilika. CDA formed a task force under collectors of Puri, Khurda, and Ganjam for *gheri* demolition in 2000¹²⁵. Every year revenue department demolishes

¹²³ *Sunia* is the date on which fishing community of Chilika take lease of their fishery sources from the state. It generally falls in the month of March.

¹²⁴ During a discussion with Adikanda Behera, Gola on 18/08/2015.

¹²⁵ In January 2011, 2000 fishermen with 600 boats on the call of Chilika Maschyajibi Mahasangha entered in to the lagoon to uproot *gheri* from the lake. Before the intervention of state they had deared around 1,500 acres of Chilika from prawn *gheri*. However, the state intervened in the process to avoid any kind of law and order issue. State assured fishing community to take appropriate step for the demolition of *gheri*. Latter task forces are formed under each of the three revenue district for regular demolition of prawn *gheri* from the lagoon. Information collected from fishers and also backed by news

gheris in Chilika and CDA provides fund for demolition. By 2015 as expressed by Dr. S. K Mohanty; CDA had spent 95 lakhs for *gheri* demolition. However, as stated by officers and fishers, the task force and *gheri* demolition have failed to stop prawn culture in the lagoon. There are many reports on the failure of state in demolition of *gheri*.¹²⁶ As reported in the blog of Orissa post¹²⁷ even after the Supreme Court ban on aquaculture, *gheris* are clearly visible in and around the lagoon.

Chingudi mafias often get prior information of *gheri* demolition. *Chingudi Mafias*- often referred to those who invest for prawn culture in the lagoon- of Chilika consist of big businessman, political leaders, and some time bureaucrats. They have good connection with various office bearers. Such connections help *Chingudi mafias* to get prior information about *gheri* demolition. Prior information help them to take all precaution to minimize their loss. Often only after all their catch is harvested, task force arrives to demolish the *gheri*, causing as minimum loss as possible. They reduce height of enclosures to make the *gheri* invisible to task force. There are also examples when strategically, law and order situation were created to stop demolition. Failure of demolition drive is often contributed to lack of political will. Many fishers opined that *gheri* demolition is not deterrence to these illegal activities, and some allege official's convenience in demolition of *gheri*, at all levels ranging from officials, collectors, peons, MLAs and even ministers.

As one can see in this section, the existence of aquaculture captures a major portion of benefit resulted from opening of new mouth, and consequently divert benefits towards wither non-fishers or the rich section of fishing communities. Beyond this, it is also clear that the practices of subleasing and forceful encroachment certainly can't be contributed to factors, such as unawareness and economic nature. These practices has deeper route to the internal power dynamics within communities and

report accessed from <http://www.thehindu.com/todays-paper/tp-national/tp-otherstates/police-intervene-to-stop-demolition-of-prawn-farms-by-fishermen/article1107876.ece>

¹²⁶ Time of India also reported on 15th November 2015 that *gheri* demolition in Chilika was so far very ineffective and the state has directed the revenue department of Puri which is the major hub of prawn culture to demolish prawn *gheri* and book the people engaged in prawn farming for legal action. Retrieved from <http://www.newindianexpress.com/states/odisha/Illegal-Prawn-Gheri-to-Face-Penal-Action/2015/11/15/article3129269.ece> on 28th May 2016.

¹²⁷ CRPF to Protect Chilika Fishermen at behest of HC accessed from <http://www.orissapost.com/cpf-to-protect-chilika-fishermen-at-hc-behest/> on May 28, 2016.

among communities, role of the state, its bureaucracy, broader market, and also the materiality of fishing sources. All these factors are entangled in a very complex manner, which the state needs to address in its policy major. However, organizing training program, formulating law to ban aquaculture, and forming taskforce for *gheri* demolition as we see have failed to bring the desired outcomes, as it fall into the same trap of manipulation and appropriation.

Use of unsustainable fishing traps

JICA (2009) reveals that most of the fishers in Chiliak practice one or more kind of unsustainable fishing practices. Except prawn *gheri*, unsustainable fishing in the lagoon includes use of *Patua jala* –it's a dragnet catch all size of fish- and *Alami jala* – filament net of small mesh size are mostly used at mouth by local fishers for indiscriminate fish catch. Use of *khanda* for the entire year and setting *khanda* in close proximity hinders free movement of fish in the lagoon so adversely affect Chilika fishery. *Khanda* has replaced almost all kind of traditional fishing traps and is used by both fishers and non-fishers.

State attributes lack of awareness as the major reason of prevailing unsustainable fishing practices. Consequently, many training and awareness program were conducted for fishing communities. CDA in collaboration with NETFISH from 2011 onwards have conducted numerous awareness meetings with fishing communities in and around the lagoon. In this program fishery expert from CDA and NETFISH train fishers about sustainable fishery. In each awareness programs experts train 30 active fishers of each village. Awareness programs conducted by CDA provide quantitative information on fish productivity, impact of unsustainable fishing practices, and benefits of wise use of fish resources. Additionally efforts are made to make aware fishers about the need of cooperative society.

These training programs are designed for dissemination of knowledge to the community, which attempted through experts advises, drawing on examples of sustainable fishery, and distribution of booklet. Awareness programs are carried out with the assumption that fishing communities are ignorant about the impact of unsustainable fishery practices. It assumes that fishing in Chilika is always guided by

individual intentions to maximize their catch from the common sources. Most of my interviewees in all the four villages are found to be aware about impacts of unsustainable fishing practices.

Observations on these training programs reveal that these programs emphasize on economic value of fishery, and very rarely reference towards other value of the resources are discussed in these meetings. It reduces relation between fishing communities, fishery resource and lagoon into some economic indicators. Dominance of economy in valuing nature-society relation however, is the major reason for unsustainable fishing practices at the lagoon. Awareness programs failed to reflect that unsustainable fishery practices in the lake are not merely a product of un-aware fishing community and economic gain.

While state see prevalence of unsustainable fishing practices as one of the major reasons ceasing benefits from new mouth, communities in outer channel see opening of the new mouth, as one among many reasons for them practice unsustainable fishing. Nolias of Arakuda are well known for using all kind of unsustainable fishing traps and juvenile catching. They use *Alumi net* and *Patua Jala* at the sea mouth and in the migration route of fish. Traditionally fishers of Arakuda fish at sea mouth and shift their fishing area with mouth. The old mouth was their traditional fishing source. New mouth however, was dug in the traditional source of Shipakuda village and they are not allowed to fish at new mouth. The opening of the new mouth has changed the materiality of the fishery sources and redistributed the resources. However these changes rarely address the way these fishing communities, their fishing practices and nature of fishing sources were shaped for centuries. Consequently, communities with their traditional fishing traps and skill face difficulties to adopt to this sudden changed nature of their fishing sources. With time they have come up with few local arrangements, for instance, fishers of Arakuda are only allowed to fish at Shipakuda, either they have to lease areas for fishing or they have to share their catch. These arrangements are informal and carried-out off the record. These arrangements, on the other end encourage fisher to maximize their catch by all means.

Fishing communities see these unsustainable fishing practices as strategies of survival. Declining catch and raising investment resulted from opening of new mouth

compelled fishers to adopt all unsustainable fishing practices, which in long run reduce any positive implication of new mouth.

The nature of fish also influences fisher's behavior. As narrated by Dibakar Jali of Mainsha:

“Fish is not something fixed and our fishery sources are not like agricultural land. If I don't catch a fish because of smaller size, there is no guarantee that someone else won't catch it, or even ever it will come back to me”.¹²⁸

Fishing communities see unsustainable fishing practices more as a way of survival rather than economic gain. The phenomena of opening of new mouth, declining catch, rise in the market value of Chilika fish and growth of unsustainable fishing practices are related to each other in a very complex web of relation of cause and implications.

Juvenile Catching at Arakuda

Juvenile catching in Chilika is an upshot of aquaculture has developed to supply prawn seeds to prawn *gheris* both in Chilika and outside of Chilika. Fishers catch prawn juvenile at and near the sea mouth and middlemen transport it from fishers to prawn mafias. Fishers from Arakuda catch juvenile both from Chilika and Sea Coast (see fig 5.8: A fisher collecting juvenile from sea and fig 5.9: show catching of juvenile in Chilika). In process of juvenile catching, juvenile of every other species also get caught. Fisher separate prawn juvenile and dispose rests on the land that causes death of huge number of juvenile of other species. Consequently juvenile catching obstructs natural recruitment of fish into the lake.

During off season of marine fishing many fishers of Arakuda catch juvenile to sustain their family. It is because fishing in their traditional source has drastically reduced and only few fishers can afford the expense to fish at the mouth. After the introduction of aquaculture in Chilika, juvenile catching started at Arakuda in 1990s. It is the poor fishers having no boat or motorized boat, children and fisherwomen who are mostly engaged in juvenile catching. Tiger prawn juveniles are sold at the rate of Rs. 100/- for 1000 juvenile and the middlemen transport it to the prawn *gheris* of

¹²⁸ Interview with Dibakar Jali, Mainsha on 11/06/2015.

other part of Chilika. The link between opening of new mouth and juvenile catching can be captured from narrative of Balla Behera of Arakuda; as he said:

“Before opening of new mouth we (family of the respondent) were not catching juvenile. There was no need to catch juvenile as income from fishing used to be sufficient. Now during off season, when we are entirely dependent on Chilika and there is no fish in our fishery source, juvenile catching become means of our survival. We fishers have to buy everything; rice (as landless) now even fish. Only water and fire is free.”¹²⁹

After new mouth was open at Shipakuda traditional fishery source of Arakuda became unproductive. At the same time fishing in sea need more investment and is seasonal. Poor fisher failed to afford marine fishing. Mostly one find fisher without boat and traps, women, children, and widows are engaged in juvenile catching. Many fishers having boat and traps also catch juvenile during off season. Fig 5.9: is a collage of photos capturing life at *Tanda*, the sand ridge formed between sea and the lagoon is the hub of juvenile catching by fishers from Arakuda.

Fig 5.11 is a grocery basket of a fisherwomen. As she explained it consists of 10 kg rice, 500 grams of lentil, one packet salt, 100 ml. edible oil and is bought for a month for her family. She is a widow and lives with her five year son in *Tanda*, and lives on juvenile catching. The conversation happens when she was waiting for a boat to sail her to *Tanda* from mainland. *Tanda* referred to the narrow sand spit that separates traditional fishery source of Arakuda from the sea and is the hub of juvenile catching (see Box no 4.1: life of fishers catching juvenile at *Tanda*).

Juvenile catching is restricted by law of the state, however it rarely get implemented at ground. Similarly traditional values do not allow catching of juvenile and fish at their breeding stage, as narrated during a meeting:

“Our forefathers don’t catch juvenile, if any time they get a mother fish in their net during breeding season used to release it to the lagoon carefully, so that it can produce thousands of fish, and return to the lagoon with more fish.”¹³⁰

¹²⁹ Interview with Bala Behera, Arakuda on 07/08/2015.

¹³⁰ Interview with Gorama Behera Arakuda, on 04/08/2015.

All these value systems have disappeared from communities, and the village organization can hardly do anything to restrict its poor member from earning their livelihood from juvenile catching. Fishers see it as a moral hazard and contribute declining catch as the major reason for it.

To stop juvenile catching and other unsustainable fishing practices, and to check impact of increasing number of fishing population, state sees alternative occupation as solution. ICZM project has provided subsidized loan to fishing community to divert fishing population in to other occupation. These projects however, seem to be failed at ground. Failure of alternative livelihood programs sponsored by ICZM can be contributed to appropriation, corruption, and unsuitable nature of alternative occupation.

Mismatch between fishing practices and changing nature of fishery sources

The new mouth has altered ecological characteristics of fishery source, especially in outer channel. Fishery sources of many fishing communities, such as Shipkuda Banamalipur and Parbatipur in outer channel area become unsuitable for fishing. Changing nature of their fishing sources have made fishing difficult with their traditional fishing traps and practices. The fishing sources of four villages, taken for this study, are affected in many different ways by opening of the new mouth. Fishing source of Mainsha and Berhampur become close to the new mouth and presently fall in the migration route of water and fish. Fishing source of Arakuda, on the other hand which was located near old mouth became far from the new mouth. Fishing sources of the fourth village, i.e. Gola become close to the channel dredged from new mouth to the confluence of river Daya, Bharagbi, and Luna.

Distance of fishing sources from the new and old mouth in many ways determines implication of new mouth on fishery sources and fishing practices. Due to near vicinity of sea inlet, fishery sources of Mainsha and Berhampur are in direct influence of tidal forces. Consequently, in the absence of any blockage, the velocity of water has increased. High velocity water doesn't allow villagers of Mainsha and Berhampur to use their traditional traps, i.e. *Khadi jala*. Old mouth used to be at

Harachandi near Village Arakuda. It was 30 to 35 km far from the fishery sources of Mainsha and Berhampur. Due to distance and existing blockage on the way impact of tide and ebb were mild and water in fishery sources of Mainsha and Berhampur used to be relatively stagnant and brackish. Brackish nature of these fishery sources had facilitated growth of various kind of sea grass, which was destroyed due to increasing water velocity and salinity after opening of the new mouth. These grasses are locally called as '*Chari*'. Growth of *Chari* in fishery sources of Mainsha and Berhampur was dense and was habitat and grazing ground for prawn and fish. As those water meadows vanished from these fishery sources fish enter in to Chilika with high velocity water and washed away with efflux of water. Now fishery sources of Mainsha and Berhampur transformed to a migrating path for fish and prawn. Such transformation confines available time for fishing to the time of tide and ebb. However increase in the velocity of water during tidal period, as described by fishers, makes fishing difficult with their traditional traps. With ebb these fishery source get dried up leaving water only in channels, again making the source unsuitable for fishing for a considerable time. Sand infestation is widely visible in fishing source of Berhampur making it unsuitable for fishing during rest of the time. Dredging only maintain the depth of the channel, while other part of sources are getting silted leading to decline in depth. Additionally invasion of *Kastura* (Barnacle) in fishery sources makes fishing difficult. As stated by Saratchandra Dalaie of Mainsha:

“After opening of new mouth a new species called *kastura* grow in our fisher source. *kasturas* cut our traps and feet. We are afraid to get into water with bare foot. *kastura* bite is very pain full and the wound takes many days to be healed keeping us unemployed for those entire periods.”¹³¹

Due to declining catch, invasion of *kastura*, and increasing cost of fishing many fishers sublet their fishery sources to fellow fishermen with very minimal payment of Rs. 2000 to 3000 per annum. Subletting of *kbias* to fellow fisherman is quite common in Mainsha. As Fishery sources of Mainsha and Berhampur become close to the mouth, salinity of these sources has increased. Hydrology of these fishery sources

¹³¹ Interview with Sarat Chandra Dalai, Mainsha on 14/07/2015.

become more marine rather than brackish which it used to be. As stated by a fisher's wife in the village Mainsha:

“After the opening of the mouth the nature of our source has changed. Water in our fishery source becomes more saline like sea water, so also fish. I find test of fish caught from our source also has changed, it tests more like marine rather than of brackish water.”¹³²

Additionally fishers from Mainsha and Berhampur, don't possess traps and skill to fish from running water. In 2015 fishers of Berhampur invited fishers from Arakuda to fish in fishery sources of former. Fishers from Arakuda used their trap and labor to fish and shared their 50% of catch with Berhampur. Such practices encourage unsustainable fishing practices like indiscriminate catch by using traps like *Patua jala* and *Alumi net*. In such situation fishers make sure to catch maximum.

In contrast to Mainsha and Berhampur fishery sources of Arakuda after opening of new mouth become a fishery source of shallow water. Traditionally fishers from Arakuda used to fish at sea mouth, which was located near the village. Unlike fishers from Mainsha and Berhampur, traditionally *Nolias* of Arakuda are equipped with skills and traps to fish in running water. They possess large and motorized boats and large and expensive fishing traps like gillnet, *alumi jala*, and *patua jala*. After the opening of new mouth, which is now around 30 km away from Arakuda the old mouth gradually got closed. Closing of old mouth transformed fishery source of Arakuda to a shallow and steady water body with very less natural recruitment of fish. The transformation of traditional fishery sources of Arakuda is well captured, when a fisher say 'opening of new mouth converted our fishing sources into a pond'. Channel that are dredged from Magarmukha towards Balugaon and towards the confluence of river Daya and Bhargabi divert most of incoming water towards central Chilika minimizing impact of tide on the traditional source of Arakuda, which is located in opposite direction. Consequently fishers from Arakuda, left Chilika fishing and are more dependent on marine fishing.

Opening of new mouth has its worse impact on poor fishers of Arakuda. Especially fishers without a boat or having a non-motorized boat are worse affected

¹³² In conversation Harasha Jali, fisherwoman, Mainsha on 14/06/2015.

as they cannot catch fish from the mouth anymore. Old fishermen are also affected as they can't travel far for fishing or can fish in sea. A respondent while discussing about effect of new mouth on fishing sources of Arakuda, introduced me with an old man, returning after fishing from the lagoon, with a very small number of fish rapped in a polythin and said:

“This 70 year old man also has to fish for his living. At this age he can't fish at mouth. He entirely depends on our source and fish through box net.”¹³³

Now for fishing, fishers from Arakuda travel to new mouth located at a distance of 1 hour sailing time by motorized boat. In addition to the expenses of large boat and traps expenses towards fuel become additional burden on fishers as there is continuous rise in cost of constructing boat and their maintenance, labor cost of crew members, and price of traps. Fishers of Arakuda also often pay rent for fishing at mouth, which now situated in traditional fishery sources of other fishing communities. Otherwise they have to share their catch. Such conditions in addition to decline in catch discourage many to fish in the lagoon. Many experience of, when cost of fishing exceeds income incurred from fishing are narrated by fishers. As Agadhu Behera- the headman of the village-narrated, while showing me 100s of boats at *Jetti* (fig 5.12):

“You can see there are so many boats at our *jetti*. This is rainy season, during this period we don't do marine fishing and at night we go for fishing at mouth. At night from this many number only few – mostly large boats- will sail for fishing at mouth. As there is no fish in our source and people having country boats don't go for fishing.”¹³⁴

Another fisher sitting beside the headman joined the conversation and that fishing at Mouth is very tough and leads to many conflicting situation and describe an incidents:

“Yesterday one of our village brothers was beaten by fishers of other villagers. He was fishing at mouth and denied to share his catch. There are many such incidents of conflicts, assaults, physical and verbal abuse. Even some time they (fishers from other village) forcefully seize our boat and traps.”¹³⁵

¹³³ In conversation with Babuli Behera, Arakuda on 16/08/2015.

¹³⁴ Interview with Agadhu Behera, Arakuda on 27/07/2015.

¹³⁵ Interview with Sesadeba Behera on 05/08/2015.

Opening of new mouth has affected life of Arakuda fishers in many ways. With increasing fishing expenses fishers become more dependent on commission agents. School dropout rate has increased. Many fishers are migrating out in search of work resulted from occupational displacement.

Fishery source of Gola which is in the central sector of the lagoon is more affected by the dredged channel from new mouth to confluence of river Bhargabi, Daya and Luna. After opening of new mouth and dredging of channels, influx of water from the catchment of river Bhargabi is reported to have increased, which transformed fishery sources of Gola to fresh water for six month of a year, reducing the availability of fish. The impact of the opening of new mouth is well articulated by a fisher from Gola, as he said:

“The old mouth was at Harachandi. Water flow into the lake used to be through various channel, and across blockages, so influx used to be slow as well the efflux. Migration of species also used to be slow which was allowing species to be spread in to the entire lagoon. New mouth is at the centre, as the influx become high at the same time efflux; species enter into lake and quickly washed away by ebb. People near mouth get catch and rests are not.”¹³⁶

Recently there is invasion of certain kind of jelly like species in their traditional sources affecting fishing practices. Bhagaban Dash is the only active fisherman of his family and had not gone for fishing for two days. As he stated two days before, it was windy and there was high tide in the lake. Two days before the date of interview, he went for the fishing in the morning and took his son for his help. But while collecting fish his *kebanda* found to be full of a species like Jelly and accidentally it went to his eye. His eye had an inflammation and for two days he couldn't go for fish. These kinds of incidents reported to become common in the life of fishers from Gola (fig 5.13: Jelly kind of species floating in the fishing sources of Gola).

State documents contain statistical inscriptions of rising quantity of fish landing after opening of the new mouth. The quantity of fish landing failed to reflect on the quantity of fish caught by individual fishers. As one can see the opening of new mouth, has brought many changes into the existing distributional pattern of resource.

¹³⁶ Interview with Braja Behera, Gola on 09/08/2015.

The change in the physical nature of fishing sources has differently affected fishing practices of fishing communities. The benefits that are supposed to arise from opening of new mouth has been ceased by many other factors, such as unsustainable fishing practices, use of unsustainable fishing traps, and mismatch of fishing practices with changing nature of sources. Many of these hurdles seem to be recognized by the state, and many initiatives were put forth to overcome. Partly it's happening because of insufficient nature of understanding which predominantly un-reflexive, technocratic, and managerial in nature.

5.5 Discussion and Conclusion

Opening of the new mouth has different impact on the four fishing communities. New mouth has brought considerable changes in to the materiality of fishing sources that get manifested in the fishing practices and consequently relation between fisher and the lagoon in numerous ways. Adaptation to this reengineered materiality of outer channel varied at both community and individual level. There are very many factors, such as materiality of the fishing sources, fishing traps, infrastructure availability, skills and capital, i.e. fund, political support, and social linkages that communities are possessed with and the kind of institutional arrangement. Each of the four places and their constituents i.e. fisher, fishing communities, their fishery sources, and their fishing practices get continuously reproduced through process of change, resistance, and adaptation. These processes, as we see are specific to a community and place, for instance the varied way these communities have responded to aquaculture, illegal subleasing and changing nature of their fishing sources. State initiatives often failed, as assumptions undergird these initiatives does not capture these complex reality of places. Decision of opening of new mouth that was recommended by many scientific studies and mathematical modelling, ignored the historical co-existence and co-production of nature and culture of fishery practices at the lagoon. Similarly while providing alternative livelihood, first it does not address the issue of presence of non-fisher in Chilika, second it rarely considered the nature of community in which it was implemented. Similarly to check over exploitation and unsustainable fishing practices, state came up with legal, managerial, and technocratic majors like ban on aquaculture, *gheri* demolition, and training programs. These initiatives are insufficient in their design

to address any kind of anomalies, variation and uncertainties at the stage of implementation.

It was assumed by the state that restoration of ecological health will boost production of fish and automatically issues with fishery will be solved. Local communities are not at all consulted even whose occupation and livelihood got affected by the project. When the new location of the mouth was opposed by fishing communities, studies were undertaken; however, benefits of new mouth were analyzed in terms of increase in production of fish from the lagoon. The way scientific knowledge undervalues other kind of knowledge can be well articulated from the response of a state fishery officer. As he said:

“My experience of working with them for my entire career however, shows in whatever aspect you say their knowledge on resource management is very meagre. Fishers don’t know about the fishing population, number of boat sails in Chilika, and they have no knowledge of quantity of catch and its verities. If they have knowledge why they block Palur and new mouth areas? They need to be educated scientifically about the recruitment process.”¹³⁷

With such assumption, like state in conventional NRM practices, CDA predominantly draws on expert knowledge. Connection between CDA and fishing communities is rather weak. CDA interaction with fishing community is confined to provide fishery infrastructure, such as, construction of jetty, community hall, distribution of ice box, financing demolition of prawn *gheris*, and conducting awareness programs. The mandate of the CDA also kind of sees human and nature in separation. Institutional objectives of CDA are dominated by biological, ecological and economic management of the lagoon. Consequently, most of the initiatives taken by CDA have focused on the ecological reengineering of the lagoon, and undervalued socio-cultural factors affecting respective initiatives at the level of implementation. CDA emphasizes on the ideology of, ‘we do manage fish and the lagoon not people’.

This is partly because the design of the governance body of CDA, which is assigned with the task of formulating policy. The governance body constitutes of CEO of CDA, secretary of various government department, Collectors of Puri, Khurda and

¹³⁷ Interview with S. K. Mohanty on 05/07/2015.

Ganjam districts and the Chief Minister of Odisha as the Chairman. There are also representatives from some other institutions, such as Wetland International South Asia, Head of Department of Ocean Engineer (IITM, Chennai). There is no provision of community representation, though MLA of Puri and Khurda constituency are part of the governance body of CDA. In CDA, all the officials and researchers are from the disciplines of natural sciences who are trained in biology, physics, chemistry, or fishery. These are no experts and researchers to study community behavior and other socio-economic-political aspects.¹³⁸ Such a composition of CDA and its governing body contributes to a bias in the policies.

Due to its very lean structure CDA is to carry out various projects in coordination with various institutions, especially research institutions. The nature of institution with which CDA has networking or coordination is also important to understand the nature of the knowledge they produce. The current institutional arrangement of lake is highly inefficient for integration of conservation and wise use of Chilika resources.

The institution that produces knowledge need to be reflexive towards its own structure and kind of knowledge it produces. Being reflexive on the practices of knowledge production, allow the institution to reconstitutes its governing body, to become more inclusive, and to address the need of the time. It makes the institution accountable and responsive towards the feed backs.

Despite CDA being a locally located institution, it doesn't make conservation practices place-based. The technocratic approach of CDA has undermined social aspect of Chilika fishery. This chapter demonstrates the need for a change in nature of assumptions that guide fishery policies and institutional arrangement at Chilika Fishery. The conclusion here is that these interventions has to be revised by

¹³⁸ As Jenotoft (2003) wrote: "Successful co-management requires a renewed examination of political, social and institutional matters. These are certainly among the areas where social scientists have expertise, so an increasing number of social researchers believe they have a mission in fisheries. During the last twenty years or so we have seen an impressive increase of contributions to the fisheries management discourse from social scientists, and their voices are being heard by managers and stakeholders more so than they used to be."

redesigning them and by taking in to account all the social, political, economic dynamics along with the physical nature of the lagoon and fish.

Fig 5.1: Three natural inlets of Chilika in 1973

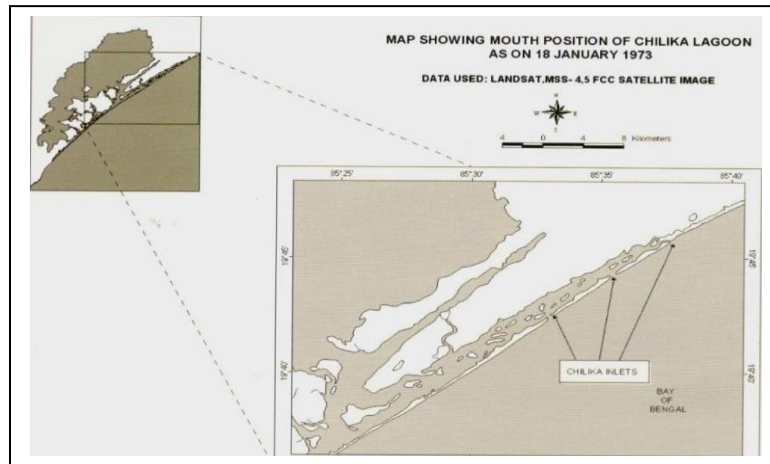
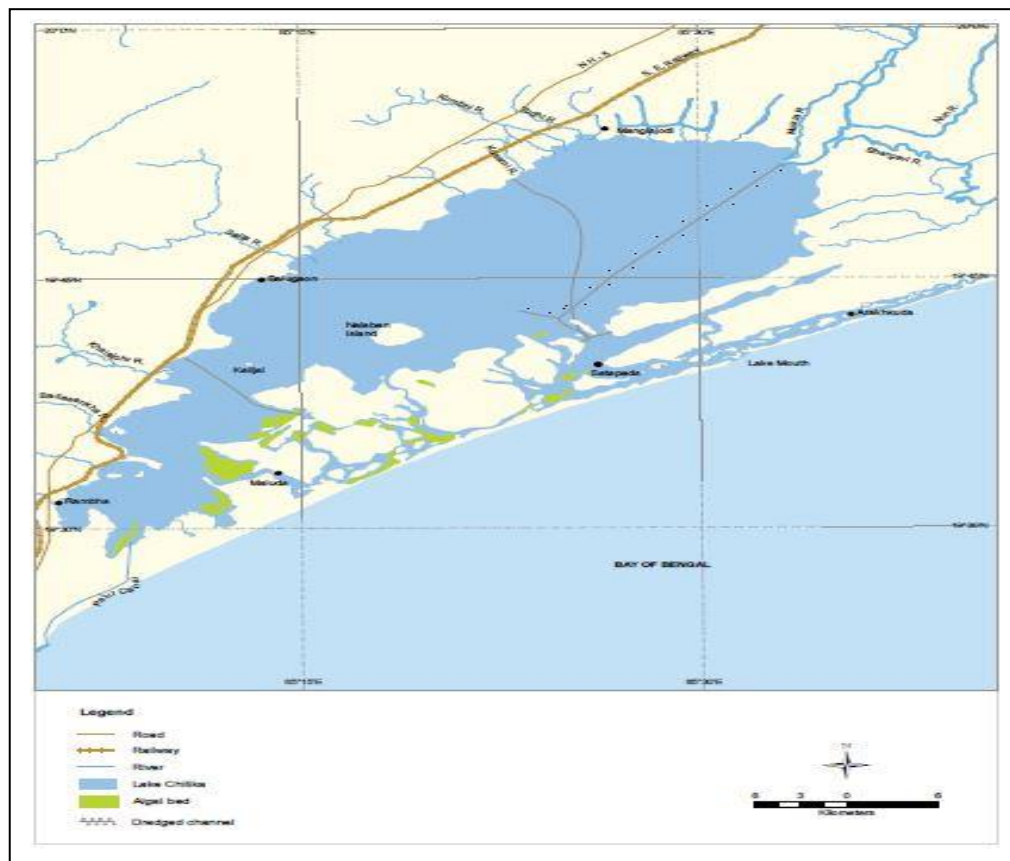
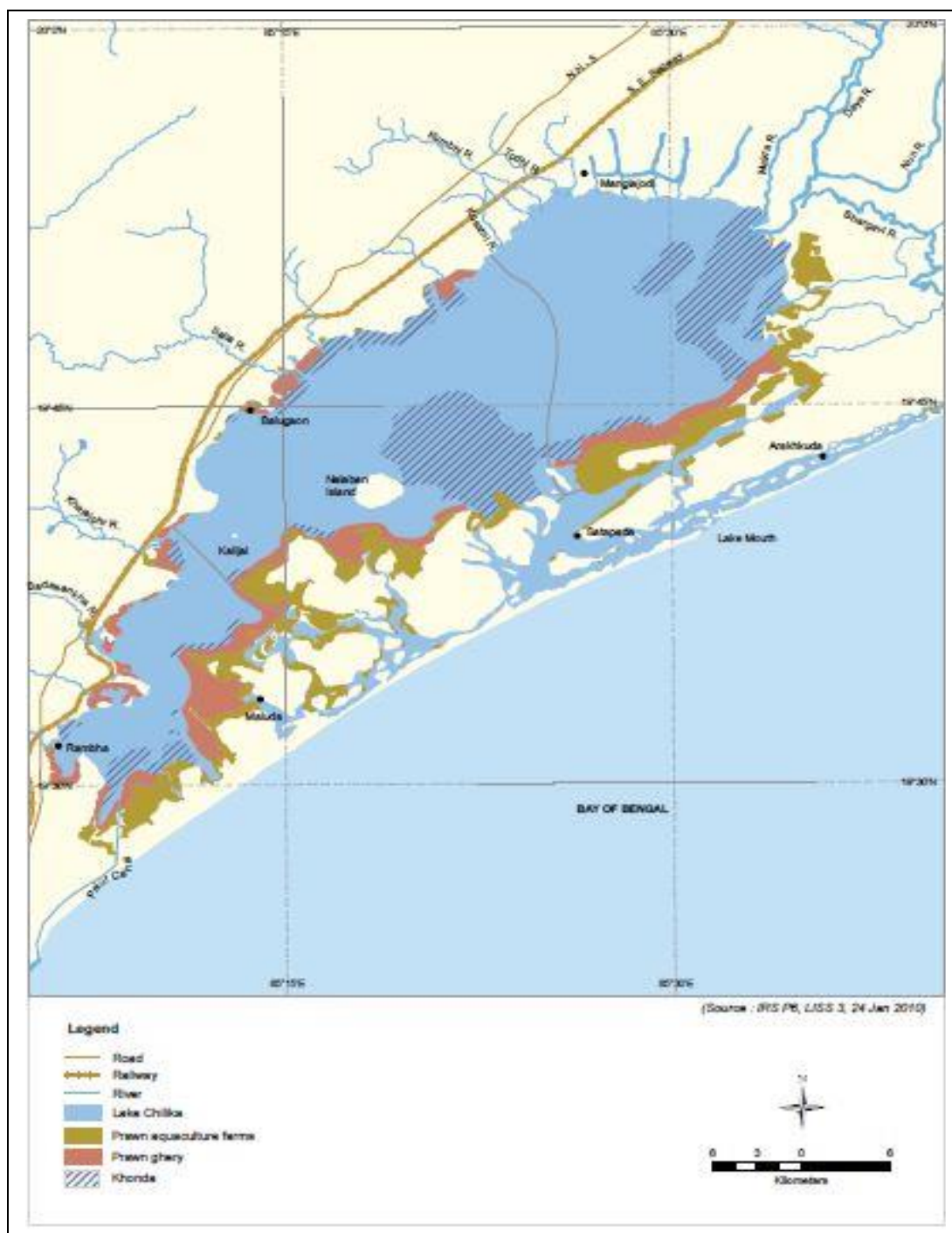


Fig 5.2: New mouth and channel dredged



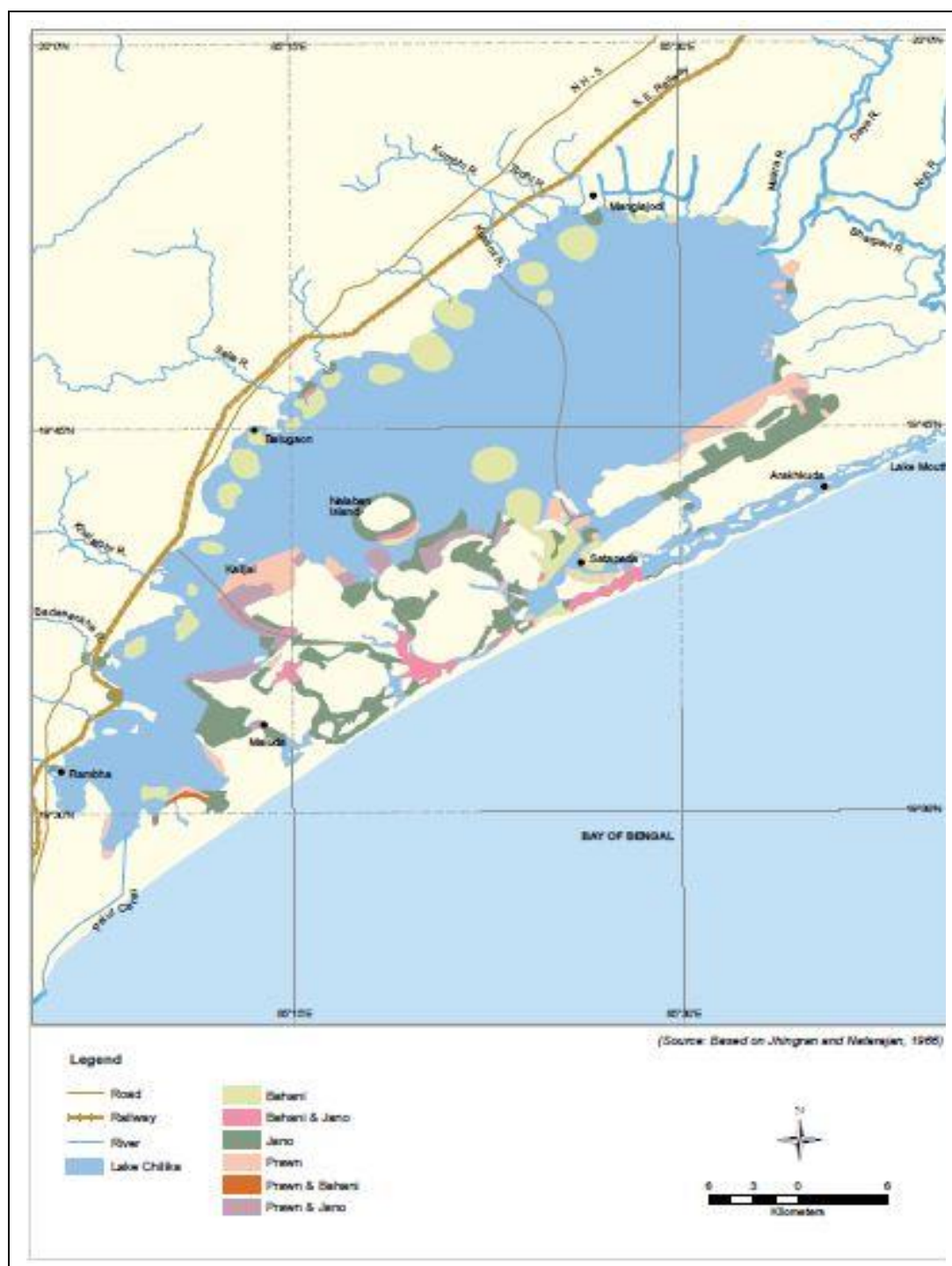
Sources: CDA 2012a

Fig 5.4: Spreading of unsustainable fishing practices in Chilika



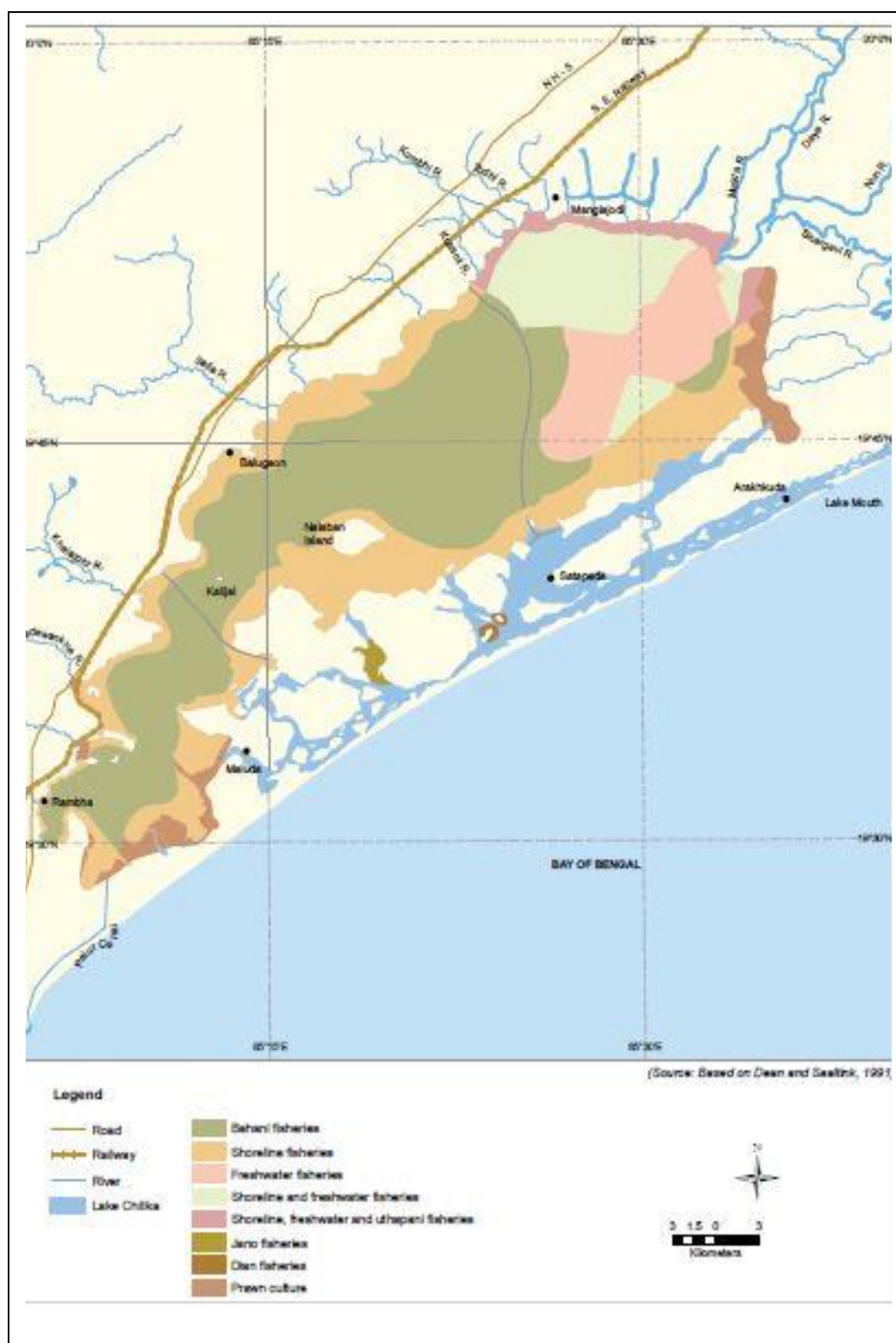
Source: CDA 2012a

Fig 5.5: Distribution of fishing area in 1960



Source: CDA 2012a

Fig 5.6: Distribution of fishing areas during 1990



Source: CDA 2012a

Fig 5.7: A fisher injured in a clash between Panashapada and Gola



Source: Fisher's photo album

Fig 5.8: Juvenile Catching from Sea



Fig 5.9: Juvenile Catching From Chilika



Fig 5.10: A collage of photos of life of fishers collecting juvenile at *Tanda*

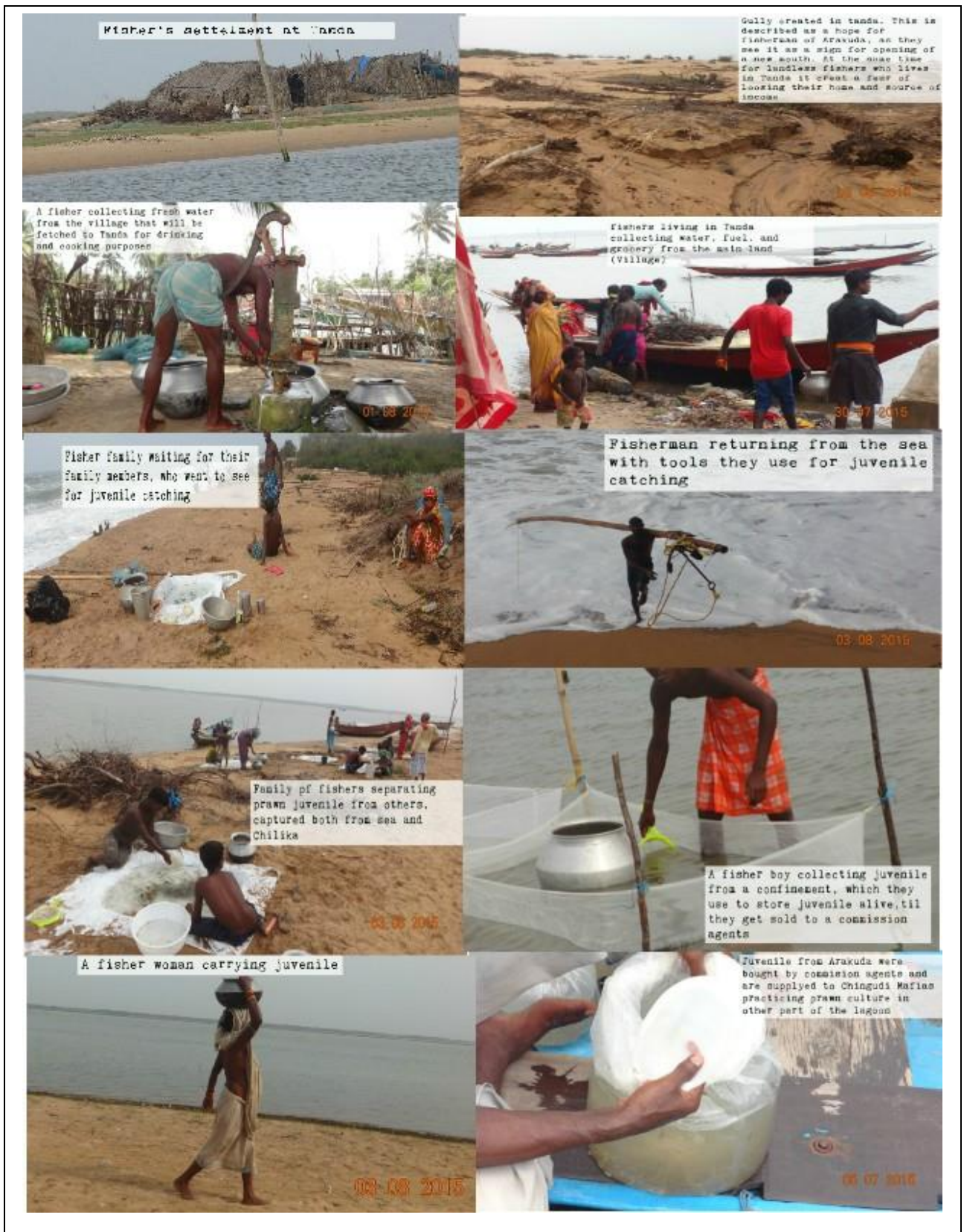


Fig 5.11: A grocery basket of a fisher women living at Tanda



Fig 5.12: Boats resting at Arakuda Jeti during off season for marine fishing



Fig 5.13: Invasion of Jelly kind of species in to the fishing source of Gola



Chapter 6

Understanding Fishery Practices

6.1 Introduction: State and fishing communities

For centuries, Chilika fishery that provided employment and nutritious food to the communities was managed by traditional community organizations. Indigenous knowledge of fishing communities regulated spatial and temporal use of traps and fishing practices¹³⁹. However, with the introduction of aquaculture, there has been increase in the number of motorized boats, besides encroachment by non-fishers. The process of commercialization of fishery sector has threatened the livelihood of artisanal fishers and their age-old institutional practices. As we saw in the fifth chapter state's interventions at the lagoon draw significantly from the disciplinary knowledge of economics and is integrated with biological understanding of fish ecosystem. Consequently, state's understandings of issues are often found to be biased or partial. It is against this background one views formation of Primary Fishing Cooperative Societies (PFCS) are to address economic issues of Chilika fishery, such as fund management, poor marketing, and exploitation of fishers by commission agents. As discussed in earlier chapter, an increase in the total quantity of fish landing has failed to translate as increase in the fish catch of individual fishers. Similarly, while there is an increase in the gross income from Chilika Fishery which is substantially contributed by the rise in market prices of fish and prawn caught from Chilika, there has been negligible impact on income of fishers. This is despite presence of PFCS for over 60 years in Chilika fishery. Majority of fishers continues to be dependent on commission agents. During these years, many initiatives were taken to strengthen PFCs. Recently in post-2010 period, state has placed many initiatives to strengthen PFCS as community based organizations (CBOs), i.e., towards a community management of fishery sources at Chilika.

¹³⁹ Role of indigenous community in conservation of fishing sources at Chilika was recorded by Das (1993), Shamal (2003), Nayak (2014), Panda (1934). Sustainability of indigenous fishery management practices are also found in many other part of India (see Raychaudhuri 1980; Paramanik 1993; Santha 2007).

Like other sectors of National Resource Management (NRM), such as forestry and water, decentralization in fishery sector is a nascent experience, which has brought state closer to those who are governed, both spatially and institutionally. Scholars, such as Berkes (2004) and Jentoft (1986, 2003) have advocated sharing of management practices by community and state. The formal recognition of the importance of fishing communities in decision-making came with the Swaminathan committees (2005) recommendation to recognize the role of traditional institutional arrangements in conservation.

6.2 Traditional community organization and fishing practices at Chilika

Formation of a fishery cooperative restructured institutional arrangement of Chilika fishery. Through Chilika Reorganization bill (1959) and other fishery policies, state transferred the right of leasing and managing fishery sources from *gramasabha* to PFCS. PFCS from its very beginning was established for linking fishers with the market and to abolish role of middlemen in Chilika fishery. However, the significance of PFCS has ebbed and followed over the years. In 2010, a 'co-management' strategy by reviving PFCS was adopted. PFCS are provided with funding for their initial investment and marketing, financial assistance for alternative livelihood, and distributed ice box for preserving their fish catch. Intensive awareness and training programs were carried out among fishers for wise use of fish resources. By 2015 there are 140 PFCS in and around Chilika having legal status to manage fishery sources of the lagoon. The transition to PFCS at Chilika Fishery has been from a traditional arrangement i.e., *gramasabha* placed over a long period of time.

Chilika fishery has been managed by traditional organizations of fishing communities. These traditional organizations were called as *Desha* and *Gramasabha*. *Desha* is the caste based organizations in Chilika fishery, fishing communities of each sub-caste among Chilika fishers constitutes a *desha*. *Desha* is related to *jajamani*, marriage, and other cultural rituals. *Desha* played a major role in regulating traditional fishing practices, distribution of fishing sources, and especially in conflict resolution. *Desha* however, has lost its importance because of internal conflicts among member fishing

communities and weakening of enforcing traditional rule and regulations. Under *desh*, fishing sources of member communities were managed by *gramasabha*, their traditional village level organization. Fishing villages at Chilika are mostly inhabited by fishers belonging to particular sub-caste. *Gramasabha*, which consists of head of each family of the communities, regulates accessibility of individual fishers and fishing practices in their respective fishing sources.

Vignettes on role of *desh* on fishery management of the lagoon

One day, I was sitting in the PFCS godown of Mainsha, interacting with fishers, commission agents, and office bearer of Mainsha PFCS. The objective was to observe collection of fish catch at Mainsha PFCS. The Mainsha PFCS godown constitutes a small room with asbestos roof, a door and a window. In the room there was four ice storing box, which are used for storing fish. In the both left and right side of the room there are two chairs made of concrete. On the right side the Pradhan sits and weighs catch, and next to *pradhan*, there were three commission agents with their basket to collect the fish. Every morning fishers bring their entire catch to PFCS godown, the *pradhan* weighs their catch and take a note on the quantity of verities of catch. In case a fisher has middleman, the secretary weigh the catch, divide the catch into two parts, half of the catch is sold by PFCS and half by the middleman. A fisher gives his entire catch to PFCS if he has not taken loan from middlemen. Before weighing there catch, as a part of their tradition fishers put aside some part of their catch for *pradhan*. This tradition is regarded as a gift or acknowledgement of the effort of *pradhan*. On that particular day, after fish collection was over at Mainsha PFCS office, and before fish gets packed for market, some quantity of fish and prawn were kept aside to be used in preparing food for fishers from Alanda Patana, a village of Keuta fishing communities. On the previous day, fishers from Alanda Patana had arrived and took shelter in Mainsha. Fishers from Alanda Patana and Mainsha belong to same caste-group and identify each other as *desbbahi* (clan brothers). Additionally, because of the intra-caste marriage system among Chilika fishing communities, most of the fisher family of Mainsha have their relatives in Alanda Patana. Fishers from Alanda Patna had fled from their village after a violent conflict was broke out between Alanda Patna and their neighboring non-fishing communities of village Alanada. As I was informed, non-fishers of Alanda had forcefully encroached over the fishing sources of Alanda Patana which led to the clash. Day before that day, there was a conflict between villagers of Alanda and Alanda Patna and subsequent police cases were registered. Fishers from Alanda Patna, being a very small and isolated fishing community in Chilika had left their village in fear of getting arrest by police and getting beaten up again either by villagers of Alanda or the Police. Mainsha had provided them shelter and food for their stay period at the village. The village Mainsha also helped them in legal procedure and in organizing other kind of support, such as consulting with politicians and other agents to help Alanda Patana. The cooperation of Mainsha to Alanda Patana was mostly

guided by the fellow feelings between these two communities being member of the same *desh*. Though over time *desh* has lost its regulative power over the communities, the traditional caste organizations of Chilika fishery community still hold their importance in many aspect of Chilika fishery.

There have been significant shifts at Chilika fishery. Those include introduction of aquaculture and non-fishers, disintegration of traditional spatial-temporal pattern of distribution of fishing practices, and weakening customary institutional arrangements, such as *desh* and *gramasabha* in the management of Chilika Fishery. Much of these changes had began with the introduction of nylon net into Chilika Fishing. A fisher from Mainsha, who claimed to be the first fisher in his community to use nylon net for the construction of his traps, describes his experience as follows:

“I bought nylon net from Balugaon selling ornament of my wife. Fish catch rose by many folds. Many villagers were anxious seeing the quantity of catch. They were worried that at that rate of fishing, fish from our source would soon get depleted. Many advised to stop, and a few times there were conflicts. However, gradually everybody has replaced their traditional trap by nylon net, especially due to the durability and ease of use of nylon net.”¹⁴⁰

While one may attribute tectonic shifts at Chilika fishery to the decision of introducing nylon nets, one cannot ignore that state interventions had multitudes of implications on the socio-cultural life of fishing communities in the lagoon. There has been a continuous effort from the state to regulate fishing practices. Introduction of two tier cooperative structure into Chilika fishery is one of the important measures taken by the state. There are Primary Fishing Cooperative Societies (PFCS) at the community level that is assigned with responsibility of taking lease of fishery sources, distribution of fishing rights among its members, marketing of their catch, and facilitating fishers availing various welfare schemes. At the regional there is an apex body, which is vested with the responsibility to take lease of fishing sources from the districts revenue departments and to sublease fishing sources to traditional fishing communities.

¹⁴⁰ Interview with Biravdra Karana, Mainsha on 18/06/2015.

The objective of this chapter is to assess the failure of PFCS through the experiences of four fishing communities of the lagoon, i.e. Mainsha, Berhampur, Gola, and Arakuda. This is because:

“Governance is about politics and the way power is distributed between different actors within society. It is about how people share decision making and how this affects their ability to empower themselves and other”. (Bene and Neiland 2006)¹⁴¹

A reflexive understanding of how decentralization is working can unfold dynamics of relation among fishing practices, institutional arrangements both traditional and new one, power structures, and nature of the resources at the stake. I begin by tracing the chronological history of cooperative at Chilika Fishery.

6.3 History of cooperative society in Chilika fishery

In 1922, the first fishery cooperative store was established in Chilika by erstwhile Bihar-Orissa government. The basic objective in setting up the cooperative store was to supply all daily necessities of fishery to the Chilika fishers and exporting dry fish. In 1942 Dr. Gajendra Nath Mitra, the founder director of the Orissa Fisheries Department and the first fishery officer of Odisha took an initiative to form the first fishing cooperative society in the southern sector of the lagoon. The major objective was to improve the economic status of fishers by directly linking fishing communities with the market.

1959-1980: A period of contractualization of relation among state, fisher, and fishing sources

In 1959, the government of Odisha constituted a committee under the chairmanship of A.F. Leide-Law, a Canadian expert on fishery cooperative, to examine the functioning of the PFCS. The committee, in turn, recommended a cooperative structure for management of Chilika fishery under the state control *sairat* leasing policy. Under this scheme, state was possessed with the ownership over the lagoon and its

¹⁴¹As referred in Benne (2009); Be'ne', C., & A. E. Neiland. 2006. From participation to governance: A critical review of the concepts of governance, co-management, and participation and their implementation in small-scale inland fisheries in developing countries. *Policy, economics and social science discussion paper series*. World Fish Center. <http://www.worldfishcenter.org/resource_centre/GovernancePaper.pdf>.

resources. Fishers were only given using right, provided they take regular lease of the fishing sources, which is called as *Sairat*. Under this act, districts administrations were directed to lease out sources to PFCS annually. However, at the community level the committee suggested continuing with the age-old traditional community-based operation of fishing sources. Accordingly, PFCSs were formed as a state promoted grassroot institutional arrangement and Central Fishery Cooperative Management Society (CFCMS) was established as the apex body of cooperative structure in Chilika with responsibilities to manage leasing of fishery sources, marketing of catch, and providing working capital and necessary infrastructural facilities to member PFCS. Twenty five PFCS were formed to market their fish catches through CFCMS (Das 1977)¹⁴². However, in practice only a few PFCS were marketing fish catch through CFCMS, and instead *gramasabhas* continued to manage their fishery sources. Many fishing communities, without forming PFCS were also obtaining lease of fishery sources through Leader-Bahania¹⁴³. In 1974, revenue department revised lease principles, which restricted leasing of *Sairat* to PFCS only. By the year 1975, forty five PFCS were formed in and around the lagoon (ibid.). The 1959 *sairat* leasing policy and the subsequent one contractualised fishing right of fishers in the lagoon. Simultaneously, an attempt was put forth to reorganize the user group, i.e. fishing communities and their practices, in this case, into a particular institutional frame of cooperative structure.

1980s: Decade of early commercialization and intrusion of non-fishers

The state introduced *sairat* leasing practices and marketing system formalized and aimed for a uniform relationship between community and fishing sources. As documented by the state, and narrated by many elderly fishers, many PFCS continued to market through CFCMS until the spread of commercial aquaculture in the lagoon in the 1980s. The spreading of aquaculture in Chilika shifted possession of fishery

¹⁴² Das, H. S., R. K. Sinha, and B. N. Sinha. 1990. Some observation on Chilika Wetland Ecosystem, in B. N. Sinha (ed.) *Ecosystem Degradation in India*. New Delhi: Asish Publishing House.

¹⁴³ Community fishery sources, from the very beginning were managed by their traditional community organization i.e. *Gramasabha*. The leader of the village were responsible for paying revenue to the then princely kings and Zamindars. They are often referred as leader-*bahania* or *Pradhan/Mukibia*. After independence fishing communities without PFCS continue to get lease on the name of those village head.

sources from fishing communities to non-fishing communities, and thereby weakened hold of traditional organizations on resources. Functioning of PFCS, was also affected as many communities started subleasing their traditional fishers to non-fisher. Traditional fishing sources that had been predominantly used for capture fishery were transformed into culture sources. Traditional fishing traps were replaced by *kebanda* and *gheris* and led to decimation of traditional fishing practices. Leasing policy (1988) directed the CFCMS to lease out 100 percent of *Sairat* to PFCS. Consequently, there was a formal exclusion of *gramasabha* from all legal and formal responsibilities of managing fishery sources. Towards end of the decade, few PFCS were formed by non-traditional fishers who were allowed to take lease and fish in the lagoon.

1990s: A near absence of leasing and no marketing of fish catch

By 1990s, aquaculture was widespread in Chilika fishery and marketing of fish catch through CFCMS was closed. The state suspended leasing of fishery sources for seven years (1992-98) due to the promulgation of Coastal Regulation Zone Notification (1991). Suspension of leasing rights further weakened the working of PFCS in the Chilika Fishery. Later, due to escalated encroachment, declining catch, and rise in leasing prices of fishing sources, many of the PFCS refused to take sublease of their traditional fishery sources. Consequently, most PFCSs become defunct and near absence of leasing practices weaken working of CFCMS. Chilika Fishery policy 1993 and its revision on 1994 categorized fishery sources of the lagoon into capture sources and culture sources and reserved 30 % of culture fishery sources for traditional non-fishing communities. A near absence of leasing practices and the provision of 30 % reservation intensified aquaculture and presence of non-fisher in the lagoon. By the end of the decade, from 127 number of fishery sources in Chilika, 15 were surrendered by fishing communities due to unproductive nature of their fishery sources and from rest 112 fishery sources, about 30 % were forcibly encroached by traditional non-fishers (CDA 2009).

2000-2010: Bureaucratization of cooperative structure of Chilika fishery

In the year 2001, FISHFED¹⁴⁴ was formed. Formation of FISHFED bureaucratized the cooperative system of Chilika Fishery and there was no representation from fishing communities in this newly formed apex body of the cooperative structure at Chilika fishery. The functioning of FISHFED, like CFCMS, got confined to sub-leasing of fishery sources. As, majority of PFCSs had stopped taking lease of fishery sources; the relation between the apex body and many PFCS were weakened. Additionally, the location of FISHFED at Bhubaneswar, which is more than 100 kms away from the lagoon, restricted access of fishing communities to the apex body. In the year 2009-10, a total of 104 PFCSs were registered with FISHFED, and of which 11 became dilapidated and the number of working PFCS stood at 91 with a total membership of 30,606 fishers.

2010 onwards: Revitalizing fishery co-operatives as CBO for fishery management

In 2010, the apex body of Chilika fishery cooperative was restructured again and was named as Chilika Fishery Cooperative Society Ltd (CFCS). The draft plan of CFCS had a core objective of strengthening forward and backward linkages between PFCS and CFCS in matters, such as fish marketing, management, supply of fishing requisites to the PFCSs, and promotion of responsible fishery. The formation of CFCS changed the composition of the apex body, where representatives of PFCSs are the office bearers. Between 2010 and 2015 all documents of member PFCSs were renewed, and the elections were held for the constitution of PFCS and CFCS. By this process fishing communities are incorporated into fishery management in composition of CFCS.

The history of fishery cooperatives is dominated with the mandate of facilitating marketing of fish catch. And the time to time reforming of policy initiatives and apex body of the cooperative in a way formalized and uniformised relation between fishers and the resources and fishers and the state. In the major part of the history of fishery

¹⁴⁴ FISHFED is an all primary fisherman co-operative societies in the state of Odisha. The federation is involved in various kinds of activities, such as marketing of fishery product, fishery inputs and development of infrastructure. Among the number (333) of PFCS affiliated with FISHFED, 140 PFCS are from in and around the Chilika.

co-operative at Chilika, the economic value of the resources was in priority. In the next section, an assessment of PFCS as CBO is discussed.

6.4 Assessing working of PFCS

Despite more than 60 years of presence and numerous reorganizations of cooperative structure, both at the apex and community levels, PFCS at Chilika fishery is a mere formal requirement for many fishing communities. Despite its legal status, PFCSs do not have a role in either regulating community fishery sources or in the marketing of their fish catch. There has been a spurt in the number of PFCS, which by the year 2014 reached 144. However, this increased number of PFCS doesn't necessarily bring about improvements in the functioning of fishery and fishers. During the training programs carried out by CDA and NERTFISH, for fishers I found that except the president and secretary of the concerned PFCS, very few members of PFCSs were aware of the basic rules and regulations of the cooperatives. Same was observed during FGDs and interviews. It is partly because of the absence of functioning of PFCSs. The functioning of PFCSs in Chilika fishery can be summarized as follows:

- **Absence of marketing through PFCS:** All seventeen fishing villages, I visited in 2014-15, formed PFCS and majority of them had more than one PFCS. However, only two PFCS i.e., PFCS of Mainsha and Santinagar Colony, among all PFCS in these 17 villages, were reported for marketing fish catch of their members. In rest of the communities, fishers market their fish catch through commission agents.
- **Absence of leasing practices:** The majority of fishing communities don't take sublease of their fishery sources. Among 17 fishing villages I have visited, only two fishing villages, i.e., Mainsha and Gola, regularly, take sublease of their fishery sources.
- **Disorganized management:** While various government schemes are channelled through PFCS, there is, however, no proper documentation, audit,

elections, and regular meetings of executive boards of PFCSs to implement them effectively¹⁴⁵.

- **Lack of working capital:** Most PFCSs have failed to raise fund on their own for providing finance assistance to members and to bear office expenses. Consequently, majority of fishers depend on commission agents for the initial investment, maintenance, and so market their fish catch to commission agents.
- **Elite-capture:** Like in other sector and places, one can see misappropriation of welfare schemes by leaders and comparatively well-off members.

An increased number of PFCS does not necessarily translate in successful managing of Chilika Fishery. Despite having no practical role in the management of fishery sources, there is a substantial increase in the number of PFCS. By 2015 there were 140 PFCS, who have constituted their executive members, and participated in election for the constitution of apex body. The growth of fishing population and inter-and- intra-community conflicts are among some of the reasons for an increase in the number of PFCS. Restricting lessee right only to PFCS and limiting leasing area to 1000 acres per one PFCS in 1988 leasing policy might have also contributed to the division of old PFCS and formation of new additional PFCS (see table 6.1).

Table 6.1 Formation of PFCS during 1959-2015

Duration	Number of new PFCS formed
1959-80	43
1981-2000	28
2001-2010	9
2010-15	61

Source: IRCS Balugaon

Inter-and-intra community conflicts have also played a prominent role in formation of new PFCS. At the beginning, multiple communities had constituted single PFCS, which was taking lease fishing sources and distributing among member

¹⁴⁵ Though the basic functioning of PFCS are not carried out, communities however, maintain their PFCS office building, registers of president, secretary, executive members, and general members of PFCS. It is primarily because maintaining these documents are made mandatory by the state.

communities. Later, member communities formed their own PFCS. For instance, the fishing community of Mainsha was part of Satapara PFCS, along with *keutas* of two other villages i.e. Alanda Patna and Satapada. In 80s Mainsha along with Alanda Patna got separated from Satapada and formed Mainsha PFCS. In subsequent year, Alanda Patna got separated from Mainsha and formed their own PFCS. Since, Mainsha PFCS constitutes fishers from Mainsha village. The reason ascribed, as remembered by fishers of Mainsha, were conflict among member communities regarding distribution of cost and benefit of functioning a PFCS. Recently, in 2011 a new PFCS was formed constituting a section of fishers from Mainsha. The reason ascribed for formation of this new PFCS, however was the growing number of membership with old PFCS. Similarly village Gola, earlier was part of Jadupur PFCS now constitutes two PFCS of its own. Internal conflicts also resulted in formation of PFCS. For instance fishers from Berhampur have formed two PFCS. Berhampur PFCS was one among few oldest PFCSs of Chilika, however, in 2011, a group of 70 fishers of the village who were in conflict with traditional leaders of the village constituted a new PFCS named Pragati PFCS. The two PFCS constitute supporters of two different political parties.

Division of Old PFCS and new PFCS are also articulated as a strategic move from the community to grasp a larger share of beneficiary schemes. The same is well articulated by a fisher from Mainsha during our conversation, as he said:

“Beneficiary schemes are channeled through PFCS, and numbers of schemes received by a PFCS are fixed and often limited. For example subsidized loan only come for 20 members of a PFCS at a time, similarly number of ice box, solar lanterns, and many. By having two PFCS we may get 2 times of the benefit.”¹⁴⁶

As described by a fishery officer of the CDA, recently, with increasing number of beneficiary schemes, more numbers of fishers are taking the membership of PFCS. In 2010, CDA declared a scheme for providing subsidized loan to fishers to get rid of middlemen and strengthen PFCS. The scheme has a plan to fund 40 PFCSs by providing Rs. 10 lakhs each. The chosen PFCS are needed to distribute the money among 20 members, Rs. 40,000 each. Through this financial assistance, those respective fishers are supposed to pay back their loan from commission agents and to

¹⁴⁶ Interview with Adikanda Jali, Mainsha on 08/06/2015.

start marketing of their catch through PFCS. As one can see, with limited resources only 40 PFCS out of 140 can be funded and so only 800 active fishers can be benefited, provided the scheme get implemented as it was planned. However, by 2015 the state was only able to spend Rupees two crore of the scheme, and rest of the money was still to be distributed. Beyond the story of failure of the scheme and its reason, one can relate impact of such schemes on the growing number of PFCS. During the five year period of 2010-15, 40 new PFCSs were formed in and around the lagoon. During this period as explained by the leaders of the villages, number of members to PFCS has substantially increased. This is predominantly because members of PFCS are only eligible to avail beneficiary schemes, which are channelled through PFCSs. Secondly, it is expressed that having more than one PFCS increases the probability of receiving welfare schemes, which are limited in number. One office bearer of Pragati PFCS, Berhampur sums up functioning of their PFCS as follows:

“Like our older PFCS, the new PFCS works only in records. We have constituted PFCS to avail various government grants and schemes. At the beginning, we bought some fish, stored in the PFCS building and called officials to show that our PFCS is running well. Few photos were taken in presence of officials and witnesses, and we get officially registered as PFCS. After that day, PFCS runs only on pen and paper.”¹⁴⁷

The central objectives of PFCS centrally revolve around the practice of marketing of fish catch, however simultaneously they have become the state recognized community-based organization (CBO) to manage fishery sources. The intention reflects when leasing rights got restricted to PFCS. Between 2010 and 2015, besides renewing all old PFCS, additionally 61 new PFCS were formed¹⁴⁸ (see table 6.1). PFCS were given the responsibility of managing fishery sources and their fish catch. Time to time state has provided assistances and brought numerous changes in to its structure and practices. In next section, a discussion is made on the function of PFCS as CBO to manage fishery sources of the lagoon.

¹⁴⁷ Interview with Pradeep Malik, Berhampur on 03/07/2015.

¹⁴⁸ Derived from the information on the detail of registered PFCS provided by ARCS Balugaoan in 2015.

6.5 PFCS as CBO in managing Chilika fishery

With the wave of decentralization across the sectors of NRM, the state at Chilika fishery adopted the philosophy of ‘local solution for local problem’, especially post-2010 period by promoting PFCS as CBO to manage fishery resources of the lagoon. PFCSs are vested with functions like, getting lease of fishery sources, managing fishery sources, assisting members, marketing fish catch, representing community for official and legal purposes, and availing beneficiary schemes for community members. Among mandates of functioning of PFCS, marketing continue to be dominating from the introduction of PFCS in Chilika Fishery. However, DGNR aims beyond economic empowerment and sustainability. DGNR has many other goals such as participation of community, incorporation of indigenous knowledge system, addressing the local conditions in which human-nature relationship are formed and evolved. In next few subsection I analyzed functioning of PFCS as CBO at Chilika.

Cooperatives as upwardly accountable institutional arrangement:

The formation of PFCS in Chilika fishery was initiated during the colonial rule in orders to manage fishery sources of the lagoon. However, PFCSs have also, throughout their history, been controlled and directed by the state. Apex bodies, such as CFCMS, FISHFED, and CFCS at various times regulated the functioning of PFCS. Presently FISHFED is the working apex body of the governing Cooperative structure of Chilika Fishery.

FISHFED was formed in 1992 by superseding CFCMS. The state appointed fishery managers who were vested with the responsibility of managing fishery sources of the lagoon. There were no representation from PFCS in the apex body, and consequently there were only indirect links with fishing communities. FISHFED does not market fish catch of PFCS, and illegal and unauthorized intrusions are clearly perceptible, which indicate failure of FISHFED in its mandate of managing fishery source of the lagoon. In practice, the functioning of FISHFED gets confined into the role of mediator between revenue department and PFCS.

The absence of participation of fishing communities in FISHFED restrict incorporation of community knowledge and experiences in to policy making and the

decision often get bureaucratized or expert based. As the decision makers at FISHFED are appointed by the state, they are more likely to be upwardly responsive. Consequently, the apex body and its officials are amenable to the influence of state and other powerful interests.

Numerous narratives on the discriminative implementation of fishery initiatives have revealed how political parties in power have influenced these decision making agency in policy making and distribution of various welfare schemes. Many fishers explained that though formation of FISHFED and dissolution of CFCMS were presented as a major initiative to improve management of Chilika fishery, the decision however, was very political. This is because the formation of FISHFED happened at a time when the state was incentivizing the presence of non-fishing communities in prawn culture and fishing communities were revolting against the presence of non-fisher. To substantiate their opinion fishers noted that the then chairman of CFCMS was very active politically, and was also actively involved in practicing prawn culture. Many opined that, it is due to his political influence all the power of CFCMS was transferred to FISHFED without the required consent of PFCS. Such institutional restructuring of cooperative happened at a time, when the number of conflicts, between fishing and non-fishing communities, between state and fishing communities, and aquaculture at Chilika are at it's peak. Though many PFCS initially opposed the formation of FISHFED, they all however joined FISHFED.

In 2006, the project on Conservation and Wise Use of Natural Resources of Chilika Lagoon through Community Participation recommended for strong networking with fishing communities. Similarly in 2009, the Integrated Management Planning of Chilika lagoon advocated to strengthen PFCS and participation of fishing communities into Chilika fishery. Subsequently, Central Fishery Cooperative Society (CFCS) was formed in 2010, as a part of restructuration of the apex cooperative body of Chilika Fishery, to have representation of fishing communities in the apex body. During the period between the years 2010-2015, CFCS was functioning under the Chairmanship of chief executive officers of CDA, in cooperation with ARCS, Balugaon, who were also happened to be the Division Forest Officer (DFO) of Chilika forest division. In 2015, cooperative election was held and elected representatives from

PFCSs have become the chairman and executive board of CFCS. By the time I was in field, no power or responsibilities were transferred to CFCS.

While formation of CFCS and its mandates are known to office bearers of PFCS, particularly to presidents and secretaries, fishers in general are unaware about working of CFCS. A few village leaders, viewed formation of CFCS positively as it may lead to participation by fishing communities in the decision-making procedures. However, skeptics expressed their apprehensions, especially of political interests dominating apex body, as in the past. These fears are allayed by fishers. Prakash Chandra Sahoo, a fisherman from Mainsha; was optimistic about CFCS because of the following reason:

“At least in CFCS, the office bearer will be from among us, brother from our fishing communities. They will be aware about issues of fishing communities unlike that of officers in FISHFED.”¹⁴⁹

Adikanda Behera, a former PFCS president of Gola, also sounded positive about CFCS; noted:

“Our village voted against the party in power, there are all possibilities that villages who have voted against ruling party may face discriminations, as we faced under FISHFED. But at the same time, I think CFCS is better. If not the chairman or vice-chairman, but there will be someone or the other in the executive board who may stand for us and other communities, which support different political parties”.¹⁵⁰

While the structure of CFCS allows for representation of many, the practice of electing may shape ultimately the decisions. For instance, in CFCS both the chairman and the vice-chairman are not only from the western side of the Chilika¹⁵¹ but both of them also are supporters of same political party. Similarly, Saratchandra Dalai, President of Mainsha PFCs who was elected as a member of executive committee of CFCS, was one among the local leader of the political party, for which the entire community of Mainsha had voted.

¹⁴⁹ Interview with Prakash Chandra Sahoo, Mainsha on 25/06/2015.

¹⁵⁰ In conversation with Adikanda Behera, former president, Bagdevi PFCS, Gola, on 30/07/2015.

¹⁵¹ One of the possible reasons may be, as the majority of fishing communities of Chilika inhabit in the western side of the lagoon, candidate from western side may have larger possibility to get the leadership.

Similarly, though CFCS consists of representatives from fishing community, the objective of CFCS is prescribed by the state and focused mainly on marketing of fish catch. Offices of ARCS and DFO seem to be the chief decision makers because all state welfare schemes come through DFO and ARCS, and they are also responsible for providing license for fishing boat in Chilika, renewing licenses, and selecting beneficiary for various schemes. Interactions between personal at these offices with fishing communities are therefore about distribution of welfare schemes, and licenses.

In other words, reorganizations of institutional arrangement has not resulted in increasing direct interactions between fishers and state fishery managers. Further, accountability of apex bodies, such as CFCS and FISHFED to the fishers is negligible. PFCS seems to be less effective in relaying concerns of fishers at Apex body.

Dominance of *gramasabha* and undermined PFCS

With Chilika reorganization bill (1959), leasing right and latter the responsibility of managing fishery sources were transformed from *gramasabha* to PFCS. Role of PFCS however, are undervalued by *gramasabha*. For instance though leasing rights is restricted to PFCS, the user right of fishers however, is assured by the membership of *gramasabha*. Membership of PFCS rarely have any implication over the functioning of customary institutional arrangements of distribution of fishing practices and fishery sources.

As official requisites, president, secretary, and executive board members of PFCS are often nominated by *gramasabha*. Office bearers of PFCS act on behalf of the *gramasabha*. As described by one of the executive members of Mainsha PFCS;

“In our village, I and other executive member of PFCS are nominated by *gramasabha*, similarly our president and secretary. Our role and position is nominal and like a rubber stamps, we act as a proxy to the decision of *gramasabha*. Whenever required we are asked for signatures.”¹⁵²

The degree of influence of *gramasabha* on functioning of PFCS varies. While it is the decision of *gramasabha* that prevails over the functioning of PFCS, formation of PFCS and the intervention of the state, led to formation of new forms of leadership

¹⁵² Interview with Suvendu Karana, Board of executive member Mainsha PFCS on 20/06/2015.

at local level. In Gola, *gramasabha* takes all the decision of PFCS and nominate president, secretary and board members. In many cases PFCS leaders, especially, who have hold the office for a long period of time were reported for influencing decision of *gramasabha*. For instance in Gola, despite presence of new office bearers of Bagdevi PFCS, the village and the community still depends on the former president and secretary for official works. In narratives of former president:

“Our new president and secretary of PFCS lack in experience. I continue to look after all the official needs. Our *gramasabha* and traditional leaders have immense faith on me and they ask me for any official communication.”¹⁵³

The present secretary of Bagdevi PFCS was in consensus with the statement of former president and he added:

“No one recognize me there in either office of the ARCS or DFO. Additionally, I cannot afford the amount of time it requires to spend on offices¹⁵⁴. I am sole bread winner of my family, I need to fish to feed my family. For all official work I take help of our ex-president and secretary”.¹⁵⁵

In case of Berhampur the dissolution of their *gramsabha* has negatively affected the functioning of their PFCS. The Mainsha PFCS was one among oldest PFCS in Chilika. At present *Khatias* of Berhampur are split into two groups *Bada Panjha* and *Sana Panjha* and have their separate PFCS¹⁵⁶. Similar is the case of Arakuda. Unlike the other three, it represents a case of exanimate PFCS. In the recent move for revitalizing PFCS and constituting CFCS, no election was held at Arakuda. The weakening of *gramasabha* is prominent among many other factors for liquefaction of Arakuda PFCS. Some other factors affected de-functioning of Arakuda PFCS are; dominance of

¹⁵³ Interview with Adikanda Behera, Gola on 28/07/2015.

¹⁵⁴ The offices of ARCS and DFO, Chilika is in the western bank of the lagoon, at Balugaon. It takes an entire day to communicate those offices from Gola, which is in the eastern coast of the lagoon. Such physical distance between the fishing village and state offices discourages many fisher to communicate offices, for this purpose they depends up on the PFCS leaders.

¹⁵⁵ Interview with Aviram Behera, Secretary Bagdevi PFCS, Gola on 06/08/2015.

¹⁵⁶ *Bada Panjha* represents the supporters of traditional *gramasabha*, they are mostly constitutes of old fishermen, and their supporter. However *Sana Panjha* represents the younger generation, the youth of the village. The division of the village in to such two groups, and their naming has a deeper story of politic, appropriation, and conflict between the approach of elders and youth to manage fishery sources and other community practices. Though the story is very interesting to learn about the evolution of fishing practices in the lagoon, it is outside of the preview of this thesis.

commission agent, declining fish catch, and increasing dependence on marine fishing¹⁵⁷.

Even after 60 years of formation of PFCS, *gramasabha* continues to manage fishery sources and consequently existence of PFCS remains confined to official representation of the community. The membership of PFCS get confined to a formal requisite for availing welfare schemes.

Failure of cooperative structure to address local complexities

Chilika fishery from its very beginning has been used as common pool resources and access to fishery source, use of fishing practices and tools are decided on the caste belongingness of fisher. *Desh* was playing a major role in maintaining the traditional arrangement, by restricting marriage system and in turns rights to access. *Desh* had regulated access to fishery sources, types of fishing trap one community can use, period of fishing in their respective fishery sources. These system were put in place in relation to many other institutional arrangements of socio-cultural aspect of communities' everyday life. The present leasing practices, do not address the diversity of the nature of fishery sources and fishing community. For, e.g., uniformity in leasing price for all kind of fishery sources does not recognize differential productivity of the sources and the kind of fishing practices being carried out in those sources. This uniformity in the design of leasing practices is the result of applying a generalized model of fishery management. In resistance, many PFCS refuse taking sublease of their fishing sources.

PFCS failed to acknowledge that fishing is part of fisher's everyday life. PFCS, constitutes of active fishermen (user groups) are designed to manage fishery in isolation from other aspect of community life. Indigenous practices of fishery management however, had evolved from a complex interaction of communities' socio-cultural characteristics and the nature of fishery sources. Each *gramasabha* has their own pattern of distributing fishing sources among its member. For example, in Mainsha the entire source is divided into 60 *khanda* and each *khanda* consist of four *kebia* and is

¹⁵⁷ However there are three marine PFCSs at Arakuda, the functioning of those PFC are not connected with ARCS Balugaon and CFCS. So functioning of these PFCS are out of the preview of this thesis.

allocated to four fishers. To circulate locational benefit, on each fortnight (*Akadasi*) fishers move their *kbnada* to another location which is 15 *kbanda* away from their previous one. In Berhampur, the entire fishing source of the village is divided into two parts and accessed by two group of fishers. Kandaras of Gola, however, have no specific rules and regulation for distribution of fishing sources among community members. Fishers in Gola, set their traps according to their convenience and in cooperation with other villagers. Such diverse system of fishing practices has developed from their generations of experiences with the nature of their fishery sources, and the nature of their community. PFCS does not recognize these specificities of fisher's interaction with Chilika fishery.

Political interests in PFCS

In a conversation with fishery officials of CDA and NETFISH, after an awareness program at Bhusandapur village in Khurda district, the officials expressed to me their dissatisfaction that poor fishers are not getting benefit of the welfare scheme. One of them told:

“Selection of beneficiaries for welfare schemes largely depends upon PFCS. Benefit does not reach poor, it's the rich and relatively well-off family that capture a major share of it. Most of the beneficiary schemes channelled through a chain of actors who are mostly local politicians and work as broker. They are also connected with MLA and officers.”¹⁵⁸

This observation was intriguing me to say the least. Though PFCS by its formal structure has no connection with political parties, a close examination of functioning of PFCS indicates that there are indeed strong informal relations with political parties. In many fishing villages, PFCS leaders tend to behave as a political representative. For instance, in Berhampur congress leaders head PFCS of *Bada Panjha*, whereas leaders of BJD heads the *Sana Panjha* PFCS. Similarly, Saratchandra Dalia, president of Mainsha PFCS and one of the Board members of CFCS is a strong supporter of BJD. In Arakuda political leaders of different political parties dominates the workings of three Marine PFCS. Despite vigilance of *gramasabhas* office bearers often succeed to manipulate functioning of PFCS to materialize their political and person interests. This

¹⁵⁸ In conversation with Dr. S.K. Mohanty during fisher training program at Kalupada, on 30/05/2014.

system allows for influencing the process of identifying personnel that would protect political interest rather than of fishers. To say that fisher representatives act at the behest of political affiliation may only be partly true. Fishers collectively also influence the process through, say voting for decision making in their favor. For example, Mainsha voted collectively to the party in power, which is why Mainsha is always first among the communities to receive any kind of welfare schemes, such as financial assistance, cyclone relief, subsidized boats, nets, ice box, and so on. In the words of a fisher from Mainsha:

“Our MLA listens to us. Though number of vote from our village is less but we gave 100% of the vote. All of us agreed to vote him, despite our different personal preferences. Primarily, because the party had promised us to do all the need to provide electricity to our village. They fulfilled their promise by providing electricity to our village. We also received subsidized loan amount of Rs.10 lakhs for strengthening PFCS in its first round.”¹⁵⁹

Keutas of Mainsha besides collectively voting for him have also campaigned and influenced other communities.

These strategies by fishing communities are to sway the decision making in their favor and advance their interests. In contrast, fishing community of Gola sees the lack of political will, as a major reason for continued forceful encroachment of their fishing sources. The fishers of Gola also see themselves as neglected by the state, especially in providing beneficiary schemes. This they attribute a consequence of supporting the political party in opposition. To substantiate their point, a past president of Bagdevi PFCS¹⁶⁰ notes that his village get subsidy to cover cost of only two boats, although they suggest subsidy for 50 boats (fig 6.1 subsidized boats are getting constructed at a fishing village).

These contrasting narratives from the villages are an indication of the nexus between political parties and the working of PFCS. Furthermore, the narratives suggest a guide to arrangement between PFCS and political parties. These observations by the

¹⁵⁹ Mainsha and Berhampur both being located in an island, had no electricity supply till 2013. As it was very expensive and hard to connect this island through wire and setting up of electric pillars were also not easy. Both communities were struggling to get electricity, however in 2013, due to the political support of their local MLA, these two communities were connected with electricity.

¹⁶⁰ In conversation with Adikanda Behera, Gola on 02/08/2015.

villagers/respondent are the indicative of the ways in which design of cooperative structure, have any direct link with any political party is being undermined. Every political party, in practice seek to have their supporters nominated to PFCS and CFCS. To this end, political parties influence *gramasabha* to select their supporters as office bearers, who in turn selectively take care of the interest of fishers supporting to that particular political party. All beneficial schemes at the implementation level, are channelled through local leaders, who are likely to be village leaders with political connections. Consequently, political parties influence distribution of beneficiary schemes and develop patron-client relationship. This decision-making procedures are often political, and seems to play favoritism.

The nexus between political parties and PFCS representative is such that they are able to skew the resources in favor of some selected PFCS at regional level and individuals at the community level.

Manipulation of the decisions of *gramasabha*

In Chilika fishery, a fishing community is homogenous in terms of their caste, fishery source they depends upon, and the kind of traps they are traditionally allowed to use. Given this community level institutional arrangement and practices are supposed to be just and egalitarian. However, individual fishers are embodied and are positioned differently within a community and in relation to other community members. These differences are skills, traps, and tools fishers are possessed with, and the capital they can invest in technology and labor.

By drawing on democratic principles, DGNR encourages participation of all members in decision-making processes. However, the nature of participation is of free will also came up in the narratives of respondents. By discussing the cases of Mainsha and Arakuda I examine the nature of decision making in detail.

The Keuta community of Mainsha is often referred as a model community for its unity among villagers, and fair decisions. The *gramasabha* of Mainsha is the sole decision making body in the village. For a procedural equity, and to avoid bias and dominance, there are no permanent headmen in Mainsha. *Gramasabha*, for each meeting, selects a temporary headman who presides over the meeting and takes

decisions with the consent of general body. Such practice of temporary leader believed to make decisions fair and transparent as each one of the member are supposed to capable of leadership. However, one can always ask who are the people that are more likely to preside and take decisions? Do every one of the villagers presides *gramasabha*? The validity of this question can be articulated from the narratives of Dilip Karana of Mainsha:

“Everybody can’t become *savapati*, it’s neither only education, nor political affiliation, or money gets into account, he needs to have the quality of leadership, on whom people have faith.”¹⁶¹

Leadership, as explained by the present *makadami*¹⁶² of Mainsha is an art, that everybody does not possess it. According to him experiences is the most important aspect. And he went on explaining:

“The leader represents the village to offices. To work efficiently, he needs to be in good relation with official. I have worked in this field for long, most of the officers know me, and they don’t ask me for bribe. However, I know how to appease them. Additionally, I have good contact with our political representatives. To be a *makadmi* you need to know how to please them (politician and bureaucrats) and only then you can have your work done.”¹⁶³

These required skill to become a leader is a product of many factors. A close investigation reveal that there are some individuals, who are more likely to bear these community offices. In the case of Mainsha it is often someone either from the family of Karanas or Jali¹⁶⁴. Skill for leadership comes from family background, education, exposure, family relationship within communities, and many other factors. For example, every community member is supposed to have equal share in decision making, in space of *gramasabha*, however, there are only few who are vocal and many remain silent. In decision making silence are often interpreted as consent. Mahendra Das, a fisher from Mainsha revealed perspective of a common fisher:

¹⁶¹ Interview with Dilip Karana, Mainsha on 08/06/2017.

¹⁶² *Makadami* refers to a member, who has been given the responsibility of dealing legal matter of the village. In Mainsha the member who gets appointed as *Makadami* get a monthly payment of Rs.2000/-

¹⁶³ Interview with Pradeep Jali, working as *makadami* to *gramasabha* of Mainsha, on 30/06/2015.

¹⁶⁴ Prakash Chandra Sahoo of Mainsha told that there is some kind of capital these families possess with, such as money, land, education, and relation with influential personalities. These families act in favor of each other to appropriate decision and consequently resources.

“*Kana Naya!!* (what justice!!) We are not part of all those affairs of decision making. As per the rule of the village, we attend meetings; sit there, listen them, and come back at the end. We don’t interfere there. Even we will speak also nobody would listen to us.”¹⁶⁵

Such narration reflect a complicated nature of participation. In Mainsha, the decision of *gramasabha* are regarded as decision of all the villagers and so are bounded on every one of the village. Anyone goes against the decision of *gramasabha* faces social exclusion, denial of any help from the community, and debarred from using fishery sources. Such design often encourages limited or no participation by many, who choose to remain silent, rather than expressing their perspective, especially if it stands in contrast to the decision of village leaders. Additionally, *gramasabha* is often the space of male. Even though in PFCS, there are female executives member, they don’t participate in *gramasabha*, which take decision on behalf of the PFCS.

During a discussion on the decision making at the community level, Nishikanta Karana¹⁶⁶ of Mainsha describes the incidence of him being punished by the *gramasabha*. As he explains:

“Being a state level athlete, I had a dream to train boys from our village in sports and athletic activity. With the help of one of my friends, I started giving training to young boys in our *akbada ghara*. Many young people joined for training and exercise. When they gather they started discussing on various issues of the village, fishing sources, and many other topics ranging from everyday life to politics. At times, we questioned a few decisions taken by our elders in *gramasabha*. For instance, on the pattern of distribution of welfare schemes, the way the PFCS works, public distribution system works, and many other things. Few leaders of our village were unhappy; they were worried that we will ruin the integrity and unity of our village. Meanwhile, I became associated with our MLA. My growing popularity and political activeness are perceived as a threat to the village, personally to their position. They tried to create conflict and misunderstanding in our group. Latter, they accused me for practicing black magic in that room to encourage youth to go against *gramasabha*. *Gramsabha* ordered me to stop all my activities and fined me. I felt humiliated and disheartened, so left the village for few years. Recently, I came back and in the mean time they realized that I was not wrong and had no evil intention. The

¹⁶⁵ Interview with Mahendra Das, Mainsha on 16/06/2015.

¹⁶⁶ Nishikanta Karan was a state level athlete, has returned to his village after he failed to secure a government job. His father was previous middleman and village leader. He runs prawn culture at fishing sources of neighboring villages and owns a ferry. He was punished in the suspicion of acting against the *gramasabha*.

punishment that was given to me however was comparatively small, partly because my father used to be the *pradhan* of the village for a long time, and he had few supporters in our village. Now I hesitate to interfere in decision making of *gramasabha*. I avoid to attend *gramasabha*.”

In between our conversation *dakua* came and informed him that villagers were asking for him in *gramsabha*, which was organized that evening. Among many issues, the meeting seemed to also discuss on resuming a ferry facility connecting the village with Satapada jetty. As the ferry was previously owned by Nishikanta Karana, they were asking him to participate in the meeting. He told the *dakua* that he was not feeling well and might join little later and our conversation continued:

“See, today a *gramasabha* is called to discuss on the ferry facility. *Gramasabha* needs my cooperation, because I have a good contact with MLA and ministers. Previously I owned that ferry, but this time our *gramasabha* is planning to manage it. So instead of me, *gramasabha* will get the profit. Additionally they punished me unreasonably, why should I help them. I will just go and sit there.”

There are many other similar stories narrated by fishers of Mainsha, however, the reasons and the severity of penalties, varies. Many of them see these penalties as a consequence of opposing some of the decisions of *gramasabha*. For instance, Dibakar Jali convicted of thieving fishing net and was charged with a penalty of rupees three lakhs by the *gramasabha*. As he said, there are few leaders who are not happy with his progress and also because before he had opposed some the *gramasabha* decisions, for example, the decision of collective voting. He believed the theft case was a trap, designed by those leaders. Half of them opined that *gramasabha* and other forms of local governance is good for communities. But their experience and story conveyed that decisions and practices at community level are not neutral. Differences within a village and community is articulated by Pradeep Jali when he said:

“Most of the influential persons in our village are from the family of *Karana or Jali*. They hold important positions of the village, have land ownership, and also most educated in our village.”¹⁶⁷

So as one can see that different sections of a community are possessed with the differential capitals and the decisions at the community level are very much

¹⁶⁷ Interview with Pradeep Jali, Mainsha on 30/06/2015.

influenced by their internal dynamics. In this context, one may question how often CBOs promote equity, gender-balance, and pro-poor decisions.

Differential appropriation

Through decentralization, the state aims at creating an environment of equal distribution of costs and benefits at the local level. There are numerous examples of how institutions at the local level to be hierarchical and unequal. In the previous section, we have discussed how collective decisions and beneficiary schemes are appropriated by few. It is the differential possession of different kind of capitals that determines how decisions are made regarding the distribution of costs and benefits. This relative position is influenced by many factors, including financial status, social position in the community, family background, education, and one's personality.

Differential possession of economic capital manifested in the ability of individual fishers to invest and to influence community and state practices in their favor. For example, commission agents always play an important role in fishing communities. There are many instances, where these commission agents have influenced the decision making of *gramasabha*. Similarly, comparatively rich families get first access to beneficiary schemes because of their ability to bribe local politicians, leaders, and officials. As narrated by the village headman of Arakuda regarding how he got subsidized boat:

“I have given a bribe of Rs.15,000/- to one of those *tautor/dalal*. I was informed about the scheme, first because I am the headman and second one of those *dalal* is a nephew of mine. He told me that I need to pay Rs.15,000/- to get a new subsidized boat. I immediately gave him money and got the boat in the first batch. Later I learned that government in this scheme was distributing a boat worth Rs. 135000/- of which 10000 is subsidized and a fisher needs to pay back Rs.35000/- . However, the kind of boats we got would cost no more than Rs.5000/-. These *tautors* took rest of the money and additionally our Rs. 15,000/-. Similarly other fishers of our villages were also cheated, even there are many who have paid more than me. I asked him to return my money but he denied. I called a meeting and seek support of other fishers who have also been cheated. In village meeting, it was decided that these middlemen would keep Rs. 5,000 from each beneficiary as a payment towards their efforts and time spent, and rest they would return to us. However, already five months have passed

since then, but my nephew has not returned my money. This is my situation even after I being the headman, whereas the condition of poor villagers is worse.”¹⁶⁸

In this context, it is worth noting that Agadhu Behera is a middleman, owns two marine boats, does dry fish business, and brother of previous chairman. His accessibility to information, welfare schemes, and latter supports of villagers as one can see resulted from kinds of capitals he possessed with, which other fisher may not have.

With increasing number of beneficiary schemes, there is an emergence of individuals as brokers who communicate between officials and fishers. These people are comparatively educated to communicate with offices regarding licensing boats, putting application for various schemes, carrying out various surveys for state at their locality. Most importantly they are in a good relationship with officials and politicians. This favoritism is acquired in numerous ways, such as by daily commuting to offices, getting gifts and kinds for politician and officials, by gathering support for a party, and many more. To describe relation with state political leaders, the former Sarapanch of the village Arakuda narrated:

“We are always favorite of our former MLA. He likes my family and my husband a lot. He called us yesterday saying some guest are arriving at his home and he asked for some good fish and prawn. Today my husband has gone to his residence with some *ilishi* (a variety of brackish water fish that costs high), *bagada* (tiger prawn), and one large crab, which we bought from fishers.”¹⁶⁹

Similar perspective was offered by an official from CDA, as he said:

“It is the duty of state officials, employed at local level to rich out community. For example state employees used to visit fishing villages for collecting information, renewing and issuing new licenses, and collecting leasing prices. Then, villagers used to offer them verities of fish and prawn and ask them for one or other favor. However, now the way offices function, fishers need to communicate with offices. Officers now ask bribe in forms of cash and only few fisher can bribe

¹⁶⁸ In conversation with Agadhu Behera, the village leader of Bhagabata Sahi. And his nephew who works as contractor to build subsidized boats is the son of Agadhu Behera's sister Buli Dei who is very politically active lady in the village.

¹⁶⁹ Interview with sarapnadh of Arakuda on 07/08/2015.

in cash. These illegal communication needs skill and those brokers know how to deliver these cash and kind to these officers.”¹⁷⁰

Costmary leaders of fishing communities like Agadhu Behera hesitate to deal with officials and legal procedures. Additionally, fishing demands most of the time of fisher in Chilika. Some other reasons, such as lack of education and awareness, distance between the village and offices also responsible for the emergence of these brokers, who demand substantial amount of money to carry out the work and are often referred as *dalal* or *tautor*. Names of the beneficiaries often get decided by the officials, based on the recommendations made by these newly emerging leaders. As narrated by a fisher from Arakuda:

“In our village getting any scheme and subsidize loan depends on our connection. *Jia agadhadire rabiala au joumane taku lagi ki rahile semane paele* (those who stay afront get the first chance and their nearer and dearer come next).”¹⁷¹

Fishing communities in Chilika built their family relations within that particular *desh*, and often in the same village. Most of them are related to each other. Fishers often use these relations as social capital on various occasions. For instance, there was a complaint against one broker in the marine fandi of Arakuda, regarding appropriation of money came for the subsidized boat (fig 6.2: Boat constructed under subsidy scheme). Before police called that broker, he requested the fisher who filed the complaint and requested him to withdraw the case. Incidentally, the broker and the fisher are relatives, so the case was withdrawn and the matter was solved with a compromise. A fisherwoman of Arakuda narrated how, in everyday life, their family relations are used:

“In bank and other offices, we don’t know whom to talk and how to talk. They (*dalal*) do everything for us. Even to bribe they use their money, for which later they charge interest. Our boat and fishing license card, bank account book, voter identity card, every-thing, they only produce and they keep with them. Only when needed they ask us to accompany them to bank and offices. There we stand in some corner while they interact with officers. Some of these *dalals* are also relatives to us. For us they are our relation and we trust them, but at

¹⁷⁰ Interview with Dr. Vatta, CDA officials on 13/03/2015.

¹⁷¹ Interview with Sesadeba Behera, Arakuda on 10/08/2015.

times they don't care. On the other hand, if anything goes wrong they come to us, and ask to help them in the name of relationship."¹⁷²

To access any beneficiary scheme there are certain requirements one has to fulfil. For example, to get a subsidized boat, motor, ice box, one need to have a boat license and to get registered as a fisher. Similarly, to avail funding for house building and toilet one needs to have land ownership, while majority of fishers are landless. Often, it is the commission agent, political leaders, and traditional leaders who fulfil the recruitment and get the scheme. Such phenomena narrated as "*Telia mundare telā*". A fisherwoman of Arakuda explained this as:

"Poor fishers were excluded from getting any schemes because they don't have a land record, ownership of boat, and licenses. Despite having all these required documents, my family did not get any scheme, primarily because we had voted for the candidate who was defeated in the last election."¹⁷³

The decisions of who is getting what are influenced by many other factors too. Availability of information and accessibility is a function of many factors and practices at the local level. For instance, accessibility to information is a function of the connection of the individual with other fishers particularly to *dalals* and leaders, participation in public gathering, and participating in *gramasabha* and other meetings and programs. It is explicitly expressed in this narrative of a fisher from Arakuda, who is also a commission agent:

"There are many things that matter. We have a voice in our village, we can demand what we want. However, many fishers from our communities, especially those who lives in *tanda*, even did not get into the records of various surveys and schemes."¹⁷⁴

The nature of their occupation, i.e., fishing, demand most of the time of their day in fishery sources and does not allow them to spend in communicating offices. Middlemen and *dalal* spend their most of the time in communicating officials and politicians. Similarly how fishers accessibility is influenced by the kind of house one possessed with. As expressed by a fisher:

¹⁷² Interview with Kameenee Behera and her husband Simanchala Behera on 13/08/2015.

¹⁷³ Kailash Behera, Arakuda on 26/07/2015.

¹⁷⁴ Interview with Rabindra Behera on 05/08/2015.

“When officials come for investigation or survey, they prefer to sit on the veranda of pucca houses, and talk to them. Consequently, those who are rich and already possessed everything become the first to be registered for a beneficiary scheme and next comes their relatives. Officers rarely come to us, and when they come, they just stand on the road and ask a few questions and leave because we are poor, dirty, and illiterate.”¹⁷⁵

The differences within communities are sometime very visible in their material manifestations. For instance in village of Arakuda differences in the living of villagers in two *sahis* is perceptible from the type of infrastructure development. These differences are as articulated by villagers as follows:

“Most of the influential persons, rich villagers, and commission agents belong to Mangala Sahi. Many of them own land and are educated. Villagers of Bhagabata *Sahi*, however, are landless and poor fishers. Mangala *sahi* is at the beginning of our village. No officials comes to our *sahi*, because they work in that *sahi* and return without visiting this interior part of the village (Bhagabata *Sahi*)- like guests come and sit in *bataghara* (drawing room) and does not necessarily visit the entire house. Additionally, Managla *sahi* is also the home for people having good connection with local MLA and officers.”¹⁷⁶

These narratives capture how the social dispositions of members of fishing communities help to secure their and their relatives interest through manipulating decisions, appropriating resources at community level. However, the fellow fishers are not passive. One’s understanding of community and their everyday practices remain partial without reflecting on the resistance of poor and relatively marginalized fishers against practices of domination. The narration of Balaran Behera, a fisher from Arakuda can be stated here:

“I usually a supporter of Congress Party, but this time I have voted for BJD. In our family, we have 100 votes, and political leaders from BJD assured us that he will provide fund required for the construction of our *kuladevi*¹⁷⁷, so we all collectively decided to vote for him.”

¹⁷⁵ Narayana Behera, Arakuda on 16/08/2015.

¹⁷⁶ Gouri Behera, a fisherwoman, Arakuda on 09/08/2015.

¹⁷⁷ Among Nolia’s of Arakuda, each *dan* have their common deity, whom they called as *kuladevi*. They believe the goddess protect them in sea and in Chilika. All their rituals are performed in front of the deity. They start their fishing activities with the blessing of their *kuladevi*. In fishing villages one will find fishers to be very religious, as they know their occupation is very risky, and they are vulnerable to many kinds of natural disasters. They believe ones they sail to the sea and Chilika it’s only the God who protects them and their property. I found politicians use this belief of fishers and giving them (prolovan), to construct the temple or to fund certain religious ritual to convene to vote for them.

Here, the respondent negotiated with the power structure of his community by using first his political power of voting and the strength of its clan to secure his interest.

A fisher narrated regarding difficulties he faced when he tried to avail a beneficiary scheme by his own, without the help of any middlemen. He describes:

“My boat was completely destroyed in last Cyclone. I got Rs.1700/- as compensation, which by rule should come to the bank account of the beneficiary. He (*dalal*) asked me to share my compensation. I denied and I went alone to the bank. But the bank hardly understood anything, they asked me to do required procedure. Few days after, I took a fellow villager with me to the bank. He asked me to open my bank account, which costs Rs 500/-. From Rs. 1700/-, bank took 500 (as a fee for a new account), gave 100 rupees to the person went with me for his expenditure, had meals of 100 rupees. After our transportation expenses, I was left with 900 rupees, which I handed over to my wife and she spent it for our family. It is also partly because my boat was completely ruined by Cyclone and such a meagre amount of money was not of help. I had a boat and its license. There are people without owning a boat, got 8000 as compensation (fig 6.3: A repaired damaged boat with the help of subsidy). The compensation amount supposed to depends on the degree to which your boat is destroyed but at ground, in our village, your connections matters the most, connection with people who can bring these schemes. That is why, when the subsidized boat came for our community possibly my name was intentionally excluded from the list of the beneficiary.”

These welfare schemes, usually come through a very complex network of agencies, both formal- DFO, ARCS, CDA, Panchayat, Banks, PFCS- and informal agencies- village leaders and local politicians. Fishermen having less or no experience of dealing with official often expressed their discomfort in communicating official. They often depend upon these brokers however, there are many stories like the previous one, where individual fishers trying their own to communicate with offices.

All the four communities have similar kind of issues related to the implementation of various schemes channelled through PFCS. However, the degree differs, mechanism involves also differ from communities to communities and from individual to individual.

Besides social, political, economic, and cultural forces at place, their material manifestations, such as nature of trap one can possess (social capital), ownership of boats and their types (economic capital), houses (symbolic capital) also influence

distribution of resources and practices at field. Additionally as we see the relative position of fishers equip fishers to adapt to the materiality of 'nature', i.e. the nature of the fishery sources and fish, location of village or community, and distribution of infrastructural facilities. For example the clustering of administrative offices and markets on western shore of the lagoon is supposed to strengthen presence of middlemen in fishing villages. However the adaptation of all four communities shows considerable variance. Fishers from Mainsha, Berhampur, Gola, Arakuda sail for four to six hours by a motorized boats to reach Balugaon where offices, such as ARCS, DFO, and fish market are concentrated. Such distance discourage fisher communication with offices, direct marketing, and hinder accessibility to information do beneficiary schemes.

Among the four fishing communities, fishers of Arakuda and Gola, due to their location on mainland in addition to commission agent have option to sell their catch to businessmen, who regularly buy fish from fishers right away from the two villages. On the other hand, location of Berhampur and Mainsha devoid its fishers from direct access to market and consequently strengthen presence of commission agents (fig 6.4: A boat collecting fish from Berhampur to sail for Balugaon). The two villages are around at a distance of 3 hours sailing from Balugaon adding cost of transportation and preservation of fish. Despite being located in same island, presence of PFCS in Mainsha reduces vulnerability of its fishers from exploitation of middlemen. This is because half of fish catch of a fishers are sold through PFCS in market price. Additionally for their rest of the catch which are given to middlemen are better priced. It is partly because fishers became aware of the actual price of the catch from PFCS and partly there is no manipulation in weighing of their catch as it is done by PFCS rather than commission agents (fig 6.5: shows fish collection at Mainsha PFCs by commission agents at and Mainsha PFCs).

State is promoting DGNR through PFCS for a sustainable fishery resource management of the lagoon. Most of the efforts put forth carry the assumption that allocation of beneficiary schemes through PFCS will bring more accuracy, accountability, and transparency. However, PFCS are also subject to manipulation and appropriation by powerful interests.

6.6 Conclusion

Traditional community organizations, such as, *gramasabha* have played a major role in the conservation of commons. The current trend of DGNR tries to revive and utilize benefits of traditional knowledge, collective decision, and locals' affective relation with their environment through community participation in the governance of natural resources. Fishing communities of the lagoon have evolved with the influence of external agency like state and market, by internal dynamics of politics and unequal appropriations of institutions and resources. Despite their dependence on same fishing sources, and the belonging to same sub-caste there are many differences among fishing communities in Chilika fishery. An in-depth investigation of intra-community relations, their culture, reflects hierarchies and inequality are embedded in the community.

A power structure within a community functions through everyday practices beyond social structure, such as caste, class, and gender. At community/local level, it is the relative social disposition of individuals matter. Social dispositions are determined by complex interaction among its members, having differential possession of economic capital, social capital, cultural capital, and symbolic capital. Individuals use and exchange these capitals in everyday life to negotiate with fellow individuals, institutions, existing structures, such as, rules and regulations, and traditional practices. The processes of negotiation include appropriation, domination, resistance, and cooperation. So every member of the communities are active participant in this process of place making. Another important characteristic of these processes is continuity and evolving characteristic of negotiation, which continuously get reshaped by the different relative position of individual in the community and the nature of resource at the stake.

Fishers in Chilika are simultaneously personal and community being. In a community every members are supposed to have an equal position and share of the resources. Systems were also put forth, for example by the fishing community of Mainsha to ensure procedural equity and justice. However, in practice there are inequalities in response to the ability of a community member for differential use of

same resources resulting misappropriation and unequal harvest. A fisher tries to maximize his gain by keeping a balance between individual interest and the community regulation. Ability of fishers to manipulate community organization, rules, and regulations and to resist the manipulation influence implementation of DGNR. While DGNR devolves power to these community organizations, exploring how those power get utilized is also needed to be investigated. In the policy discourses of DGNR community regulatory mechanisms are perceived as egalitarian. There is however always a covert relation between a powerful section of the community with the institutional arrangement. Fishing communities of Chilika is no exception to it.

Externally designed CBO-like PFCS however, failed to capture those hierarchies, consequently failed to implement its objective on one hand and many times weaken existing traditional community organizations. The current frame of DGNR needs to capture intra-community differences. Power structure in everyday practices and at local scale often goes beyond the existing explanations in terms of caste, gender, ethnicity, religion, and class. Bourdieu's concept of capitals, such as, social, economic, cultural, and symbolic capital better explains local dynamics. Partly because of the fluidity assigned to these concepts, which allow understanding the role of agencies- both dominated and dominating -in transforming this capital to achieve his/her goal. Additionally, the role of the materiality of the resource at the stake and the place need to be examined carefully. The practice of appropriation and resistance are place specific and results of the complex dynamics of the materiality of the place and resource at stake, nature of community and the agency of the individual fishers. Thus, social differences which are an important aspect in the community, are fluid entities and interlinked with each other structurally and symbolically.

Installation of PFCS like other CBOs, such as, JFM and WUA reflects state's attempt to revive traditional practices, and use local knowledge for sustainable management of natural resources. However, these externally designed CBOs failed to operate in the manner as it is supposed to in the documents of the state. Rather, these CBOs become means of conflicts, misappropriation, and elite capture. Due to the formation of CBOs, as an alternative to the traditional institutional arrangement, new forms of power structure have formed. These newly emerging leaders and institutional

arrangements function in relation to various administrative offices. These newly created local level institutions are formed exclusively to manage natural resources, consequently, reduce the influence of traditional organization to dispute resolution bodies.

Fig 6.1 Subsidized Boats getting constructed at a fishing village on the bank of the lagoon



Fig 6.2: Boats constructed and distributed under the scheme of subsidizing fishing boats



Fig 6.3: A repaired boat under subsidy schemes



Fig 6.4: A boat with mahajan ready to sail for Balugaon after collecting fish at Berhampur



Fig 6.5: Fish collection at Mainsha PFCs Godown



Chapter 7

A Place Based Critique of Decentralized Governance of Natural Resources

“We seek a law that protects the livelihood rights of fishing communities rather than a mere ‘enabling’ legislation that seeks to protect fish resources and is ‘neutral’ on who catches fish. We seek a fisheries law that stresses employment, equitable distribution of fish resources and well-being of the fishing community along with conservation of fish resources. We seek ‘Aquarian reforms’.”

National Fish Workers Forum¹⁷⁸

“... Frankly speaking, out of my more than 25 years of experience, and with the current situation and the trend of fishing practices, I rarely can see any future for Chilika Fishery. Politics has entered in to everyday life of fishers and are often seems determining everything that is happening in these communities related to fishing or otherwise. Nothing else than a strong political will can save the lagoon”

Fishery Advisor, CDA

“Sir, I have something to request. I feel Chilika fishery is exploited more because, now a day, all we are more concern about Chilika in terms of how much profit we can make from what kinds of fishing. We fishers know about that. From my perspective I find very few of our present generation are aware about the cultural and spiritual value our ancestor used to ascribe to mother Chilika. For betterment of Chilika there is a need of reviving them. I have read your pamphlets and books I found everything is on marketing of fish, there are nothing on history and culture of Chilika and fishing practices. So I want to make a request to you and Ajit Patnaik (CEO, CDA) to give space to the history, culture and fishermen of Chilika on your books and posters.”

An elderly fisherman commented during an Awareness program¹⁷⁹

These three narrations by different agencies, provide perspectives on how to manage the resources and what kind of reorganization is needed for a better management of

¹⁷⁸ National Fish Workers Forum in the draft for discussion on ‘Let’s Protect Fish and Fisherman: Improving the draft Marine Fisheries Regulation and management act 2009. Accessed from <http://old.icsf.net/icsf2006/uploads/resources/usefulDocs/docs/english/%3C1265618515857%3ENFF%20position%20on%20MAFIRMA.pdf> on 6th August 2016.

¹⁷⁹ The fisherman is from the village Vusandapur, Khurda. Due to his old age he no more fish in the lake but he continues to be the member of PFCS. He is a local poet who writes on Chilika and its local history.

natural resources, such as fishery. The idea of place considered in this thesis constitutes of human and their immediate surroundings, both natural and social; the experience of a particular location that is grounded both geographically and historically, but is not static, and place is evolving as the constituents are in dynamic relation with a sense of permeable boundary. When this idea of place is applied to understand implementation of DGNR at Chilika fishery, it is apparent that there is a need to rework many; including assumptions that undergird DGNR. In this research I found human-nature relations at local level are shaped by everyday interplay among nature, human agency, and social disposition. These constituents of place seem significant in governing fishery rather than single explanations in terms of ecological and structural forces. These three constituents are relational to each other and cannot be reduced to one another.

All three constituents of reframed place, i.e., nature, human agency, and social disposition are thought of as equal important dynamics of human-nature relationship at local level. This assumption is in contrast to prevailing physio-biological characteristics in area based decentralization or cultural characteristics in CBOs. When DGNR is suffused with post-humanist idea of place there is a thick description of life world, where human interact with their surrounding on everyday basis.

At all four places of Chilika fishery the social and material distinctions may not have been shaped singularly by heterogeneous physical nature of place and resources. This is because traditional fishing practices in Chilika lagoon, has evolved over years in relation to the hydrological characteristic of the lagoon, bio-physical nature of fishery sources, and availability of fish species and their migration, besides socio-cultural characteristics of fishing communities and their skills. Accordingly, a spatial and temporal arrangement of fishery sources and corresponding fishing traps had developed in Chilika fishery. However, influence of nature at a place is more complicated.

Chilika fishery is simultaneously physical and cultural, a conception of place that acknowledges significance of nature (nature of fish, nature of different fishery resource, location of the community in relation to fishery sources, market, and other communities) and also of the socio-cultural construction of Chilika fishery. For

example, prevalence of unsustainable fishing practice by Nolia community of Arakuda is considerably shaped by the nature of their traditional sources and current source of fishing, location of the village, and materiality of the kind of traps they use.

Individual fishers within all four communities have different ways of dealing with the materiality of fishery sources of their respective communities.

Humans construct a place through his everyday practices with intentionality and experiences relation in abstract space. The Everyday interaction of fisher are many-a- times captured in metaphors, such as Chilika as their home, as their mother, and as a meaning of their life. At the same time, a fisher can't detach their interests in earning a livelihood and maximizing profit from their fish catch. Fishers are emplaced selves. Being in a place means a fisher is emplaced in a location, reflexive of action that is embodied with the socio-cultural setting and embedded on the materiality of that place. We find human agency, though not entirely determined by social structure or ecological dynamics, are also not of free will. Human agency at place would mean: "for an individual to exist is to act. Action is not meant as mere movement, but action which has an intention or meaning" Entrikin (2001).

At Chilika fishery, we found that despite belongingness to same caste and being dependent on same fishery sources there are many intra-community differences. A reflexive understanding of everyday practices reveals that experiences and actions are deeply rooted in the relative position of the agents, which is captured through social disposition. Different kinds of capitals- Bourdieu categorized them as cultural, symbolic, social, and economic – that a fisher possesses in turn is related to social disposition. Social capital includes belonging to particular clan, relationship with community members, leaders, and officials; Symbolic capital is the position in the village; cultural capital like education and communicating capacity; and economic capital, such as money, land ownership, and possession of fishing tools have considerable implication over everyday engagement of fishers. In other words a community is heterogeneous and individual fishers are differently positioned in their communities, which in turn influences the way they engage with resources and institutions at stake.

Fishers are active in making and remaking structural characteristics of the community and their practices, that is to say, shaping the place. Such an understanding of fisher's practices draws attention to political, economic, and affective aspects of resource allocation and maintenance at local level.

DGNR how as practiced it is argued is more of scaling down of management unit from center/state/region to smaller units, such as village and communities. These smaller management units are often area based i.e., physical or/and administrative area like, forest division, wild life division, catchment area. Establishment of Chilika Development Authority (CDA) is also patterned on how other Ramsar sites in India are being managed, irrespective of issues and solutions at may be required¹⁸⁰. A reflexive ethnography, however reveals that establishment of CDA, the nature of knowledge CDA produces, and the strategy CDA carries out relies on scientific knowledge only and put a bureaucratic management of the lagoon. Such a form of decentralization extended state's reach to the local but rarely devolved power to the community.

Therefore, arguably establishing CBOs, privileging scientific assessments sees the local knowledge and assessments, restricting the idea of decentralization to decision making at a different geographic scale, and so on are particular ways, in which the domain of power and politics play out in the way of natural resources are managed. As correctly put forth by Escobar:

“Place and local knowledge are no panaceas that will solve the world's problem. Local knowledge is not pure or free of dominations; place might have their own form of oppression and even terror; they are historical and connected to the wider world through relations of power, and in many ways determined by them.” (Escobar 2001)

The reflexive ethnography conducted at Chilika fishery reveals that communities have historically negotiated their social relationship and are heterogeneous. As we see in case of Chilika fishery, have demised and for this reason

¹⁸⁰ There are 26 wetland in India that are recognized as Ramsar sites. Source: <http://www.ramsar.org/wetland/india> accessed on 22/06/2016.

arguably, PFCS have failed to dislodge traditional knowledge and practices and be an alternative to *gramasabha*.

Dynamic at places are also influenced by factors and forces that originate outside of the location. Similarly network not only influence human aspect or community, but also alter the idea of nature and natural resources. For instance the importance of the lagoon was not confined to local user groups and communities, when Chiika as a wetland was recognized of international importance by Ramsar Convention. Consequently, an increasing numbers of outsiders began to view Chilika as global heritage of human kind. Involvement of organizations at Chilika, such as UNDP, UNESCO, World Bank, and JICA has immense impacts on local's relations with their natural resources because these external agencies are imposing practices at the place.

In sum, the thesis argues that a place based understanding of issues and practices at local level have the potential to disrupt conflicting interpretation held by local residents and state agencies and can open a room for reworking on the type of intervention that are needed. This work spotlights the need for not discarding any kind of knowledge, be it local or of the state. By posing 'why' question to knowledge a reflexive understanding is gained. The redefined 'place' in DGNR provides an understanding of human-nature relationship that is in contrast to understanding of proponents of CBNRM and the state' NRM. Further, place provides a fresh basis for participation of communities for managing natural resources.

Limitations and further scope of the study

My theoretical claims on place based understanding of DGNR are well supported by the case of Chilika fishery. However, the framework suggested in initial chapter needs to be applied in diverse setting to capture and provide complex understanding of place. For instance, the framework is to be applied to gain fresh insight from gender perspective to managing natural resources. DGNR in many ways have transformed the role of women in Chilika Fishers. These include reservation for women in PFCS, recognizing Self Help Group (SHG) as a party for fund allocation, and encouraging women SHG for alternative livelihood. These dynamics of Chilika fishery did not

become focus of this research work. Women are integral to fishery and the changing nature of place.

Limitations of time and resources prevented pursuing an in-depth ethnographic of women and all other communities as well. An understanding of four communities doesn't allow me to claim an understanding of the entire Chilika fishery. The idea that by reframing place in DGNR provide greater number of better opportunities to understand human-nature relations at local level, which may be working through informal networks and remain beyond the domain of decision implemented by the state. A reframing of Place in DGNR, it is evidence in this case incorporating complexities of the life world.

In the broader environmental literature two arguments are predominant. That societies are rearing (or in some cases backed) ecological limits to growth. And that the human-nature relationship is to be revisited. Both these argument are connected by the idea of advancing participatory democracy and decentralization, among others, is one key principle understanding this idea.

Critical assessments of decentralization have pointed out that the structural change and devolution of power does not necessarily translate into participation, inclusiveness, and social justice. Indeed, in many cases, decentralization has disproportionately benefitted local elites (Garcia-Guadilla 2002). Numerous cases are found where decentralized structures, such as *panchayats* and its functioning have been taken over by the politician-official-contractor nexus, which squeeze the distribution of benefit. Women representatives are working as proxy to their male counterpart in their family (Agarawal 2010), which is an instance of how formal processes of decentralization, representation, and democracy are subverted by informal processes of power and changes (Cross and Kutengule 2001; Harriss 2001; James et al. 2001; Slater 1989). Broadly, popular theories relate the failure of decentralization to socioeconomic divisions within communities, and the relative lack of political and economic power of the poor and deprived sections.

Many solutions to overcome the limitation are advocated but there are no universal solutions. For example, Bryld (2001) would suggest for abandoning the structural models of modernization which does not recognize the agency of individual. Other suggestions to improve working of decentralization include capacity building of local institutions (Singh 2016), meaningful participation (Jentoft 2003), and many more. Devolution of power is nearly absent and consequently, decision-making has strayed back to politicians and officials (Jentoft 2000; Larson and Ribot 2004). de Souza (2010) found 'context' playing an important role in the everyday practices at local level.

Thus human-nature relations at a place are viewed as a product of interaction among three constituents, i.e., nature, human agency, and social disposition. This relational nature of the three constituents reproduces practices, which manifests in the forms of norms, habits, perceptions and so there is place.

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Appendix I: Milestones in Indian Democratic Decentralization

Year	Descriptions
During Colonial Period	
1687	A municipality body was established in Madras with exclusionary nominated members
1842	A decision was made to revive the traditional village panchayat
1870	In rural areas of Bengal Presidency under Village Chowkidari Act empowered the district magistrates to forms village panchayat exclusively with nominated members. By 1870 there were nearly 200 municipalities were set up throughout the India
1882	The Rippon Resolution on Local Self-Government.
1909	The Royal Commission on Decentralization stress upon self governance
1919	Chelmsford Reform: It was accepted to transfer governance to fully representative and responsible self-government
Independent India	
1948	Constitutional debates between Gandhi and Ambedkar on Gram Swaraj, 'self- rule'.
1951	Article 40 of the Constitution of India reads 'the state should take steps to organize village Panchayats and endow them with such power and authority as may be necessary to enable them to function as unit of self-governance'.
1957	Balwantrai Mehta Commission set up for an appraisal of community development program. It emphasized to implement the Panchayat structure at district and block (Samithi) levels.
1963	K. Santhanam Committee recommended limited revenue raising powers for Panchayats and the establishment of State Panchayati Raj Finance Corporations.
1978	Asoka Mehta Committee – appointed to address the weaknesses of PRIs, concluded that a resistant bureaucracy, lack of political will, ambiguity about the role of PRIs, and elite capture had undermined previous attempts at decentralization, recommending that the District

	serve as the administrative unit in the PRI structure. Based on these recommendations, Karnataka, Andhra Pradesh and West Bengal passed new legislation to strengthen PRIs.
1985	G.V.K. Rao Committee was appointed to address weaknesses of PRIs, recommended that the block development office (BDO) should assume broad powers for planning, implementing and monitoring rural development programs.
1986	L.M. Singvhi Committee recommended that local self-government should be constitutionally enshrined, and that the Gramasabha should be the base of decentralized democracy in India.
1992	The 73rd Amendment to the Indian Constitution – PRIs at district, block and village levels are granted Constitutional status. The <i>Gramasabha</i> is recognized as a formal democratic body at the village level. The 74th Amendment, granting Constitutional status to municipal bodies, is passed soon after.

Source: Baugnet and Kumar 2011

Appendix II

List of Interviewees

Arakuda

1. Agadhu Behera , on 27/07/2015
2. Arjuna Behera, on 14/08/2015
3. Arnapura Behera and her husband Surendra Behera on 06/08/2015
4. Babuli Behera, on 16/08/2015
5. Babula Behera, on 12/08/2015
6. Babru Behera, on 16/08/2015
7. Baidhara Behera, on 01/08/2015
8. Balla Behera, on 07/08/2015
9. Balaram Behera, on 04/08/2015
10. Basudeba Behera, on 19/08/2015
11. Bijaya Behera, on 19/08/2015
12. Bijuli Behera, on 07/08/2015
13. Buli Dei, local political leader, on 20/08/2015
14. Chakradhara behera, on 18/08/2015
15. Dasa Behera, on 20/08/2015
16. Deba Bisei, on 17/08/2015
17. Dhaneswar Behera, 23/07/2015
18. Eremi Behera and her husband Surya Behera on 30/07/2015
19. Ganesh Behera, on 08/08/2015
20. Garia Behera, on 11/08/2015
21. Gangadhara Behera, former president of Arakuda PFCS , on 31/07/2015
22. Geli Behera, on 22/08/2015
23. Gorama Behera, on 10/08/2015
24. Gopal Behera, on 08/08/2015
25. Gouri Behera, wife of a fisher, on 09/08/2015
26. Haramani Behera, on 21/08/2015
27. Indramani Behera, on 16/08/2015
28. Gouri Behera, on 12/08/2015
29. Jagganatha Behera, on 10/08/2015
30. Janki Behera, on 05/08/2015
31. Jogi Behera , on 03/08/2015
32. Kalia Behera, on 01/08/2015
33. Kailash Behera on 26/07/2015
34. Kalu Behera, on 29/07/2015
35. Kamini Behera, on 05/08/2015
36. Kameenee Behera and her husband Simanchala Bhera on 13/08/2015
37. Khageswar Behera, on 31/07/2015

38. Khulana Behera, on 11/07/2015
39. Magi Behera, on 09/08/2015
40. Manar Behera, on 01/08/2015
41. Masiani Behera, on 03/08/2015
42. Narana Behera, on 17/08/2015
43. Narayana Behera, on 16/08/2015
44. Narayana Behera(2), on 11/08/2015
45. Narsigha Beher, on 14/08/2015
46. Niranjana Behera, on 11/08/2015
47. Pabitra Sahu, on 12/08/2015
48. Pabitra Behera, on 13/08/2015
49. Pallamma Behera, on 07/08/2015
50. Ram Behera, on 04/08/2015
51. Rabi Behera, on 03/08/2015
52. Rabindra Behera, middleman on 05/08/2015
53. Sesadeba Behera, on 05/08/2015
54. Sibram Behera on 09/08/2015
55. Simanchala Behera, on 19/08/2015
56. Shreemanti Behera, on 17/08/2015
57. Hari Behera, on 29/07/2015
58. Trinatha Behera, on 07/08/2015
59. Ulasha Behera, on 06/08/2015
60. Udaya Nath Behera, on 11/08/2015
61. Vanu Behera, on 12/08/2015
62. Sunal Behera, on 28/07/2015

Berhampur

1. Bairagi Jena, on 07/07/2015
2. Biranchi Nayak Jena, on 11/07/2015
3. Dama Malik, on 17/07/2015
4. Dilip Kumar Behera, on 06/07/2015
5. Dilip Kumar Jena, on 04/07/2015
6. Dinabandhu Jena, on 05/07/2015
7. Dusanta Jena, Mahajan, on 05/07/2015
8. Golak Bihari Jena, on 10/07/2015
9. Hemanta Malik, on 08/07/2015
10. Kedar Jena, on 07/07/2015
11. Krushna Chandra Jena, on 13/07/2015
12. Lingaraja Jena on 05/07/2015
13. Pradeep Malik on 03/07/2015
14. Radhaa Jena, on 05/09/2015
15. Raja Jena, on 04/09/2015
16. Ramachandra Jena, on 03/09/2015

17. Ramachandra Jena, Mahajan, on 06/07/2015
18. Ramesh Chandra Jena, on 07/07/2015
19. Ramesh Chandra Jena, Mahajan on 11/07/2015
20. Rankanatha Behera on 08/07/2015
21. Ratikant Malik, Mahajan on 11/07/2015
22. Sankarsana Hota on 07/07/2015
23. Satya Pradhan, on 07/07/2015
24. Sindhu Malik, on 08/07/2015
25. Sisira Pradhan, on 15/07/2015
26. Sisira Jena, traditional head of the village on 06/07/2015
27. Sujit Kumar Jena, Mahajan on 02/07/2015
28. Surendranatha Jena on 12/07/2015
29. Tapan Kumar Behera on 05/07/2015
30. Tikina Jena on 08/07/2015
31. Tikina Malik, Mahajan on 04/07/2015
32. Tulu on 19/07/2015
33. Vikari Behera on 16/07/05

Gola

1. Adikanda Behera, on 30/07/2015, 02/08/2015, 06/08/2015, on 18/08/2015
2. Anadi Behera, on 15/08/2015
3. Aviram Behera, Secretary Bagdevi PFCS, Gola on 06/08/2015
4. Biranchi Behera, on 22/08/2015
5. Biswambara Behera, on 11/08/2015
6. Biswambara Das, on 05/08/2015
7. Bhagaban Das, previous secretary Bagdevi PFC, Gola, on 01/08/2015
8. Bhaskar Behera, on 11/08/2015
9. Bhimaraj Behera, on 09/08/2015
10. Bhubananda Behera, on 06/08/2015
11. Biswambar Das, on 13/08/2015
12. Braja Behera, on 09/08/2015
13. Budhia Behera, on 21/08/2015
14. Dayanidhi Behera , on 07/08/2015
15. Dinabandhu Behera, on 14/08/2015
16. Kangali Behera, on 13/08/2015
17. Nakhtramani Behera, on 23/07/2015
18. Parbati Behera, on 25/07/2015
19. Parfulla Das, on 23/07/2015
20. Pradeep Kumar Behera , on 24/07/2015
21. Rajendra Behera, on 28/07/2015
22. Sabitri Behera, on 26/07/2015
23. Subrata Behera , on 29/07/2015

24. Surendra Behera, on 05/08/2015
25. Surendra Behera 2, on 07/08/2015
26. Tanka Dhara Behera, 11/08/2015
27. Upendra Behera , on 22/07/2015

Mainsha

1. Adikanda Jali, on 08/06/2015
2. Ashok Karana, on 11/06/2015
3. Benudhara Das, mahajan for 15 years, on 12/06/2015
4. Bhagaban Karana, on 12/06/2015
5. Bibarta Nayak, on 17/06/2015
6. Bighna Karana, on 29/06/2015
7. Bijaya Nayak, on 14/06/2015
8. Biravdra Karana, on 18/06/2015
9. Chita Ranjan Nayak 23/06/2017
10. Chitrasena Karana, on 19/06/2015
11. Dibakar Jali on 11/06/2015
12. Dilip Karana, 08/06/2015
13. Duryadhana jail, on 03/07/2015
14. Durydhana Jali, previous Pradhan of Mainsha, on 14/06/2015
15. Gagan Nayak, on 04/06/2015
16. Gouranga Karana, on 11/06/2015
17. Harasha Jali a fisherwomen 14/06/2015
18. HataKishore Jali, previous mahajan of Mainsha, on 19/06/2015
19. Judhistira Nayak, 01/07/2015
20. Judhistira Karana, on 02/07/2015
21. Kanhu Charana Nayak, on 25/06/2015.
22. Lalatendu Karana, on 17/06/2015
23. Laxman Das, on 05/07/2015
24. Maguni Jali, Mhajan, on 12/07/2015
25. Mahendra das, on 05/07/2015
26. Mahendra das, on 16/06/2015
27. Meheswar Karana , on 03/07/2015
28. Nabaghana Nayak and his mother, on 28/06/2015
29. Nanda Dalei and his wife, on 27/06/2015
30. Nilamani Jali, on 14/06/2015
31. Nilakantha Jali, Mahajan, on 08/06/2015
32. Niranjana Jali, a fisher man and middleman of the village on 25/06/2015
33. Nishikanta Karana, on 23/06/2015
34. Pradeep Nayak, on 14/06/2015
35. Pradeep Jali, on 30/06/2015
36. Prahald Karana, on 11/06/2015

37. Pratap Chandra Jali, on 28/06/2015
38. Prakash Chandra Sahoo, 25/06/2015
39. Ratikanta Nayak, on 13/06/2015
40. Sarat Chandra Dalia, President PFCS, Mainsha, on 14/07/2015
41. Subash Chandra Karana interviewed on 30/06/2015
42. Susanta Nayak, on 15/06/2015
43. Suvendu Karana, on 20/06/2015
44. Titu jail his sister and mother 24/06/2015
45. Upendra Kumar Jali, Mahajan for 20/25 year in the village interviewed on 29/06/2015

Interviews with officials

1. Santosh Kumar Dalai, ARCS, Balugaon on 20/08/2015
2. Debandra Behera, Chairman CFCS 07/05/2015
3. Rajakishore Behera, Board Member, CFCS on 07/05/2015
4. Kumari Behera, Vice Chairman, CFCS, on 07/05/2015
5. Dr. S. K. Mohanty, CDA 5/07/2014, 08/03/2015, and 15/07/2015
6. Dr. Bhaatta, CDA 5th July 2014, 13/03/2015
7. Mr. Pravat, Fishery Inspector, FISHFED 5/07/2014
8. Interview with Ajit Patnaik, CeO, CDA on 13/03/2015
9. Interview of CFCS member 15/07/2015