Change and Marginalisation:
Livelihoods, Commons Institutions and Environmental Justice in Chilika Lagoon, India

By
Prateep Kumar Nayak

A Thesis Submitted to the Faculty of Graduate Studies of
The University of Manitoba
In Partial Fulfilment of the Requirements for the Degree of

Doctor of Philosophy

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THE UNIVERSITY OF MANITOBA
FACULTY OF GRADUATE STUDIES

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ABSTRACT

This thesis investigates marginalisation in small-scale fishing communities in Chilika Lagoon engaged in customary capture fisheries. However, the Lagoon has undergone tremendous changes in recent decades, impacting the social, cultural, economic, political and environmental life, and resulting in fishers' disconnection and marginalisation. The study explores what marginalisation looks like from the fishers' point of view, and attempts to explain the processes and drivers responsible for change in Chilika social-ecological system, and the implications of this change, with four areas for analysis: 1) historical and political background to the processes of change in Chilika Lagoon fisheries; 2) the challenges from external drivers to fishery commons and the need to understand commons as a process; 3) impacts of social-ecological change from a livelihood perspective, including how the fishers dealt with livelihood crisis through various strategies; 4) institutional processes and their implications for fishers' marginalization.

Using evidence collected through household- and village-level surveys, combined with various qualitative and participatory research methods over 28 months, the study shows that there are two major driving forces or drivers of marginalisation: (1) the role of aquaculture development in the loss of resource access rights and the decline of local institutions, and (2) the ecological displacement and livelihood loss brought about by the opening of a new "sea mouth" connecting the Lagoon and the Bay of Bengal. There exist a paradox of the official account and fishers' own view of marginalisation. Chilika is a clear case in which government policies have encouraged *de facto* privatisation. The

dynamic nature and fluctuations associated with commons development make it imperative to understand commons as a process that includes commonisation and decommonisation. Out-migration has emerged as a key livelihood strategy resulting in occupational displacement for one-third of the adult fishers, and such livelihood strategies have led to their disconnection and marginalisation. The fishers' point of view presents a more complex, multidimensional concept of marginalisation, not simply as a state of being but as a process over time, impacting social and economic conditions, political standing, and environmental health.

ACKNOWLEDGEMENTS

I take this opportunity to gratefully acknowledge the support and cooperation of many individuals and institutions during the course of the study. First and foremost, I would like to thank my fisher friends from Chilika Lagoon for their unconditional friendship, support, and collaboration. My special thanks go to the villagers of my study villages - Berhampur and Badakul - for hosting this learning process and for their unflinching cooperation in sharing all the information with me. Members of the Chilika Fisher Federation provided their experience and knowledge on the history and current issues in the area. They added a wider perspective to the study by sharing information on developments in several other fisher villages.

I was extremely fortunate to meet Pratap who promptly agreed to help me in the field as a community research assistant. Coming from one of the Chilika fisher villages, Pratap acted as a constant link between the villagers and me, and helped me sail through the many dynamics of the village life. Thank you very much Pratap for your contribution to the success of this study. Pitambara and Nrushinha have also provided critical support for the community level work.

The local, regional and state government department officials in Odisha, especially the FISHFED, Chilika Development Authority, Departments of Environment and Forest, Fisheries, Cooperatives, shared necessary information regarding Lagoon management. Several NGOs, academic and research institutions and advocacy groups provided excellent support during the course of the study. Thanks are also due to a number of colleagues and friends in India for their many insightful discussions and help during the field research.

My advisor Dr. Fikret Berkes has been very supportive throughout the process. Starting from the conceptualization of the research proposal to finalization of the thesis, he has remained a constant source of guidance and encouragement. Thank you, Dr. Berkes, for being there - during both good and difficult times - and offering your wisdom and support. My sincere thanks to the members of my advisory committee which consisted of Dr. C. Emdad Haque and Dr. Iain Davidson-Hunt from the Natural Resources Institute, and Dr. Radhika Desai from the Department of Political Science, all at the University of Manitoba. The external examiner, Dr. Barbara Neis, provided some very insightful comments on the previous version of this thesis and I would like to offer my sincere gratitude to her.

I have benefited from numerous discussions with colleagues at the Pierre Elliot Trudeau Foundation and Harvard University Sustainability Science Programme. My mentors Dr. William C. Clark and Dr. Noel Michele Holbrook at Harvard University and Mr. Alex Neve at the Trudeau Foundation / Amnesty International Canada have provided many new insights. The Natural Resources Institute, University of Manitoba is an excellent place to engage in interdisciplinary scholarly research. I had the best support from the faculty and staff members during my tenure at the institute. The students at the institute are amazing and I could not have expected to be in a better company than this. I am proud to be a part of the Natural Resources Institute.

My wonderful friends Jim and Roselle need a special mention for their help with this document. Thank you for your time and support for proof-reading and editing several chapters. Jim, without you the last stretch of the journey would have been far more difficult – thank you for your friendship.

My parents deserve the best of my gratitude for always being there and praying for my success. My son and wife - Pranjal and Priti - deserve all the credit for not only this thesis but also for all the good things I do in life. Thank you both for your patience and the unconditional sacrifices you have made. Roselle and Donald – there is no part of this journey which does not include you. Thank you for always being there.

My work has been supported by a Doctoral Scholarship from the Pierre Elliott Trudeau Foundation, Canada and Canada Research Chair in Community-based Resource Management, held by Dr. Fikret Berkes. I gratefully acknowledge their financial support without which this work would not have been possible.

Prateep Nayak

Winnipeg, Manitoba

November 2011

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Glossary of Terms

Adaptation: The ability to learn and adapt. The capacity to cope with nonlinearities or other forms of surprise and uncertainty with openness to learning (Lebel et al. 2006)

Adaptability: Adaptability is the capacity of actors in a system to influence resilience. In a social-ecological system, this amounts to the capacity of humans to manage resilience (Walker et al. 2004).

Commons: A commons is a resource shared by a group where the resource is vulnerable to enclosure, overuse and social dilemmas. Unlike a public good, it requires management and protection in order to sustain it (Hess 2009). Commons are spaces of collective action where communities maintain the environment to sustain their livelihoods and cultural values (IASC 2010).

Complexity: The way the diversity in a community is organised into interacting set of species (Levin 1999).

Complex Adaptive System: Systems of people and nature in which complexity emerges from a small set of critical processes which create and maintain the self-organizing properties of the system (Hollings 2001).

Ecosystem services: The benefits that people derive from the ecosystem. These might include the production of goods; regeneration processes; life-fulfilling functions; and conservation of options (e.g., maintenance of ecological systems for the future) (Daily 1999).

Emergence: A property of a system, one that cannot be predicted or understood simply by examining the system's parts (Bereks et al. 2003)

Institution: The set of rules actually used (the working rules or rule-in-use) by a set of individuals and potentially affecting others (Ostrom 1992).

Narrative: Story with a chronological order (beginning, middle and end) (Roe, 1991, 1995) which exhibit human activity as purposeful engagement with the world (Polkinghorne 1995:5).

Nonlinearity: Nonlinearity is opposed to linear and mechanistic view of nature that prefers the system as productive, predictable, efficient and controllable and negates natural variations (Gunderson and Holling 2002; Berkes et al. 2003).

Multiple stable states: The idea that social-ecological systems can exist under multiple states.

Property: The rights and obligations of individuals or groups to use the resource base; a bundle of entitlements defining owner's right, duties, and responsibilities for the use of the resources, or a claim to a benefit (or income) stream (Berkes and Folke 1998).

Property right: A claim to a benefit stream that some higher body – usually the state – will agree to protect through the assignment of duty to others who may covet, or somehow interfere with, the benefit stream (Bromley 1992).

Resilience: Resilience is the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks (Walker et al. 2004).

Scale: Scale is the spatial and temporal frequency of a process or structure. Scale is a dynamic entity. For the purposes of resilience assessment, a focal scale of the social-ecological system of interest is usually determined from among: landscape/local scale, sub-continental/sub-regional, continental/regional, and global scale, over a specified period of time (Hollings et al. 2002).

Self-organisation: Self organization of ecological systems establishes the arena for evolutionary change. Self-organization of human institutional patterns establishes the arena for future sustainable opportunity (Resilience Alliance 2011).

Social-Ecological System: Social-ecological systems are complex, integrated systems in which humans are part of nature (Berkes and Folke 1998)

Threshold: A breakpoint between two regimes of a system (Walker and Meyers 2004).

Uncertainty: Because change is rarely predictable, complex systems have the tendency to organize around one of several possible equilibrium states which is known as uncertainty.

CHAPTER 1

INTRODUCTION

1.1 Background

This thesis is a story about half a million fishers (including family members) in Chilika Lagoon near the Bay of Bengal, Odisha state, on the eastern coast of India. Chilika is the largest coastal Lagoon in India, and also one of the largest in Asia, covering an area of about 1,200 square kilometers. I started my research work in the Lagoon during the summer of 2007. Being an Oriya myself, I grew up in the state, not far from Chilika, listening to the endless tales and poems that portrayed the natural splendour of the Lagoon and the unfathomable "wealth" it contained. A little over thirty five years from that time, I was confronted with the real possibility of exploring my childhood stories about the Lagoon – I was actually driving into the heart of Chilika on my very first research trip. Some of the experiences and observations gained during the forty kilometers drive from the district town of Puri to Chilika on Satapada offered crucial clues, though somewhat vague, to an entire understanding of the Lagoon and its people within a changed context. In my own naivety, I somehow sensed that "my childhood Chilika stories" were perhaps far from being real now.

My first observation was that of large areas of Lagoon waters dotted with shrimp *gherries* (aquaculture barricades) which were taking over areas that were once under the possession of the Chilika fishers. Later, I found that these barricades had emerged, through encroachments, as symbols of prosperity for higher caste elites, while at the same time, displacing caste-based fishers from their fishing occupations, livelihoods and

cultures. My second observation came when I stopped at a roadside hotel, minutes away from the Lagoon, for a typical "rice and fish" meal that no one visiting Chilika would ever forgo. I was more than surprised when I was told that they only had chicken and *rohi* fish (*Labeo rohita*, a freshwater fish from the neighbouring state of Andhra Pradesh) for the day's meal. Pitambara, once a fisher himself, but now a server at the hotel, explained that the Lagoon did not have enough fish and that whatever becomes available was too expensive to buy. I left the hotel after a meal with rice and chicken that was probably unheard of just a few years ago, for both visitors and locals alike. The absence of Chilika fish and crab from the hotel menu was something that kept me speculating about the state of the Lagoon fisheries and the fishers who depended on it. On the second day of my trip, I was confronted with yet another key observation. I saw a large group of young and middle aged people disembarking a local ferry at the Satapada jetty, carrying their belongings. Upon enquiry, I came to understand that they were fishers migrating out as unskilled workers to different cities in southern and western India in order to escape the loss of fishing livelihoods.

What did these three key observations suggest? By putting the observations into perspective, I began to realise that I was going to be dealing with a large Lagoon and a large fisher population in the middle of a massive change. Livelihood disruption, resource depletion and displacement of local people were not something that I was witnessing for the first time. I had seen these issues over a period of ten years while working with the forest dependent communities of Odisha and elsewhere in India. Even though there were broad patterns of similarities between the situation in the forests and the Lagoon, I realised that the issues were very different in the case of Chilika in terms of scale.

Lagoons are distinctively located at the interface of the sea and the land which brings in added complexity. While the laws and practices related to the sea apply on one side; cultures, norms and regulations associated with the terrestrial resource systems offer influence from the other. Thus, the "in-betweenness" character of lagoons was a significant factor for why I may have perceived the issues in Chilika differently from the situation in the forest. Moreover, the size of the resource systems (more than 1,000 square kilometres of Lagoon vs. a few hundred hectares of forest), number of users (a few hundred thousand fishers vs. a few thousand forest users) and the nature of the resource units (fish as a moving or fugitive resource vs. trees as a static resource) were crucial to understand some of the differences. I told to myself that while understanding of the forest context might be helpful, I must use a different analytical lens (a multi-lens approach) to get a good grasp of what is going on in the lives of the Chilika fishers and their natural and political surroundings. I felt that the best way to start was to ask the fishers "how would they like to define their own situation?

I followed up on my three initial observations with a number of fishers during a reconnaissance survey in about 60 fisher villages (including five non-fisher villages), trying to understand how they made sense of the ongoing situation in Chilika. Among the enormous number of answers I received, one word - *talitalanta* - repeated itself in most of the replies. *Talitalanta* is an Oriya word that denotes an extreme state of deprivation and the concept of "talitalanta" could describe the adverse changes occurring in the social, cultural, economic, political and ecological aspects of peoples' lives in Chilika. When translated to English, *talitalanta* means a state of "marginalisation". Thus, by repeatedly referring to the word *talitalanta,* the fishers made a direct reference to their

being in a state of marginalisation. My initial observations of the shrimp *gherries* (aquaculture barricades), the lack of local fish on the menu, and the outmigration of the young men were some of the causes and consequences of marginalisation.

The impetus to focus on marginalization in this thesis came from the *Oriya* term *talitalanta* which the fishers used to express their overall situation. They further clarified that there were significant changes in the status of the Lagoon resources and their customary rights leading to livelihood loss, and most fishers had a growing sense of disconnection[1] from the Lagoon. The fishers cited freshwater-saltwater fluctuations and reduced fish production to signify *change*[2], loss of fishery-based livelihoods and out-migration as forms of *disconnection*, and the sum total of the impacts from change and disconnection as *marginalisation*.

Thus, *change*, *disconnection* and *marginalisation* came up as key characteristics of the overall situation in Chilika. Here, *marginalisation can be seen as a process which resulted from unprecedented changes in the resource condition and fishers' disconnection with the Lagoon environment*. This emerged as a working definition of marginalisation from the local point of view very early in the research process and which I subsequently investigated during my field study and analysed further in this thesis. Consequently, **this thesis focuses on the processes and factors responsible for changes**

[1] The nature of disconnection (or connection), as sensed by the fishers and further established in the course of the study, ranged from social, economic, political (power and access) to physical, psychological and spiritual.

[2] I clarify that "change" may have both positive and negative connotations. However, the treatment of changes and their drivers in this thesis have been carried out mainly with a focus on the adverse or negative changes in order to accommodate fishers' voice and position. It is worth mentioning here that changes that are considered "positive" from a non-fisher point of view may constitute a completely "negative" set of changes from the position of marginalised fishers.

in Chilika Lagoon fisheries and the implications of such change for fishers' disconnection with the Lagoon and their marginalisation. Specifically, this thesis focuses on (1) accounting for the context and processes of change; (2) analysing commons rights; (3) analysing fisher livelihoods; and (4) examining institutional linkages.

1.2 Approaches to Making Sense of the Situation in Chilika

There is a range of ways through which marginalisation has been explained in social sciences theories. While this thesis recognises the importance of the existing theoretical perspectives on marginalisation, it does not take a purely theoretical approach to the understanding and analysis of marginalisation in the context of Chilika. Instead, a people-oriented and practical approach has been adopted to examine marginalisation and its associated factors of social-ecological change and people's disconnection from the Lagoon. Literature suggests that such approaches are well recognised in the work of several scholars, including Chambers (1995) who argue that the realities of the poor are local, diverse, often complex and dynamic and it is crucial to recognise that poor people's criteria differ from those assumed for them by professionals. He puts this into perspective by asking: "whose reality counts? The reality of the few in centres of power? Or, the reality of the many poor at the periphery? These realities differ more than most professionals recognize. Insights into these differences and their implications are generating a new paradigm and contributing to a new and hopeful agenda. To recognize, accept, act on and evolve that new agenda is a personal, professional and institutional challenge, demanding deep change in the ways we think and behave" (Chambers 1995:175).

The aptness in fishers' explanation of the situation in Chilika, as a process equivalent to marginalisation, also finds similarities in the extensive work done by Narayan *et al.* (2000a, 2000b, 2002) on understanding poverty from the point of view of the poor people themselves. This similarity can be seen from both conceptual and methodological standpoints. Conceptually, Narayan and his colleagues focus on poverty and ill-being as the key elements of analysis. By treating poverty as a complex and multidimensional phenomenon, they confirm that it has multiple causes and contexts which shape its definitions. Poverty never results from the lack of one thing but from many interlocking factors (Narayan *et al.* 2000b) and their study illustrates ten dimensions to this effect. Thus, using Narayan's analysis, the lens of poverty and ill-being, marginalisation can be examined as a complex and multidimensional phenomenon. Methodologically, a major contribution of Narayan *et al.* (2000a) has been to emphasise the need to understand poverty from the eyes of the poor:

> There are 2.8 billion poverty experts, the poor themselves. Yet the development discourse about poverty has been dominated by the perspectives and expertise of those who are not poor - professionals, politicians and agency officials. This book seeks to reverse this imbalance by focusing directly on the perspectives and expertise of poor people. How people express their own perspectives and experiences of poverty, its causes and how it can be reduced. (Narayan *et al.* 2000a:2).

Thus, their work demonstrates the importance of voice and power in poor people's definition of their own situation, and the need to expand our conventional views of complex and multidimensional concepts such as poverty, ill-being and marginalisation.

In a second landmark analysis Sen (1981) gives important clues on *how* and *why* situations with extreme marginalisation and poverty may come into existence. Four interrelated concepts from Sen's comprehensive work are relevant here. First, *access* denotes command over something through the legal means available and the method of actually doing it. Second, *entitlements* signify the ability of people to command access. Third, *capabilities* denote a person's opportunity and ability to generate valuable outcomes, taking into account relevant personal characteristics and external factors. Thus, he argues that starvation and famine occur not only from a lack of food, but people's lack of ability to command or access enough food, from inequalities built into mechanisms for distributing food (Sen 1981). Fourth, *freedom* implies a key determinant to achieve access, entitlements and capability. Capability, in short, is effective freedom. Using Sen's argument, one can compare a state of marginalisation with situations of starvation and famines, therefore, the use of concepts of access, entitlements, capability and freedom, in the sense of Sen (1981), as conceptual and analytical tools to understand the situation of the fishers in Chilika.

1.3 Neoliberal Policies in the Context of Marginalisation

Neoliberalism is a political philosophy and a dominant economic development approach that emphasises economic growth through minimal or no government interference and creation of free market forces (Chomsky 1998; Kendall 2003) or a

process of "accumulation by dispossession" (Harvey 2005). For the State, the mechanisms to implement this approach are many:[3] 1) Giving primacy to the rule of free market and bracing private enterprise with the freedom of capital, goods and services, with minimal government control; 2) Deregulation of government controls in order to generate profit for private business[4]; 3) Slashing its welfare responsibilities through cost-cutting measures, but allowing government subsidies and tax benefits for the private enterprise; 4) Promoting privatisation of state enterprises, goods and services by transferring them to private investors; 5) Replacing "public good" or "community" focus with one on "individual" (person or corporation) (Besley and Peters 1997; Chopra 2003).

Thus, neoliberalism as an approach tends to be indifferent to the impacts of development on rural and small-scale economies. In generating profit, it tends to encourage conditions in which the rich can grow richer and the poor grow poorer. In the neoliberal world order, similar trends, whereby neoliberal agendas drive resource and environmental management, are quite evident in different parts of the world, and have been noted by Büscher (2008, 2009, 2010) in the context of development and conservation debates in Africa; Dressler and Roth (2011) and Dressler (2011) looking at livelihoods, conservation and governance in Asia; Martinez-Alier (2004) focusing on the ecological economics and "environmentalism of the poor" in the context of South

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[3] Elizabeth Martinez and Arnoldo Garcia. What is Neoliberalism? A Brief Definition for Activists. National Network for Immigrant and Refugee Rights Online at: http://www.corpwatch.org/article.php?id=376
Andy Kilmister. 2004. Understanding Neo-Liberalism. Socialist Outlook: SO/03 – Spring. Online at: http://www.isg-fi.org.uk/spip.php?article80

[4] Analogously, the assumption that states always deregulate does not accord with statist phases of regulation, such as that described, in India or generally and theoretically (Desai, pers. comm.). Discussion on state regulation of the Chilika Lagoon which supports this view exists in section 3.4.2.2 in Chapter 3.

America and other regions; Guha and Martinez-Alier (1998) analysing the "varieties of environmentalism" through the perceptions and valuations of the environment among the poor (subordinated social groups) in four continents - North and South America, Asia, and Europe.

In India, Desai (2004b) considers that all the governments since the mid 1980s have pursued a neoliberal agenda. Much of the environmental discourses in India have been influenced by two dominant factors: 1) a strong colonial legacy of centralised resource governance and 2) forces of modernisation leading to the emergence of a neoliberal approach to resource management. Under colonial administration, the State took control of natural resources which were otherwise accessible by local people and, in several instances, managed under local institutional arrangements. However, the focus of this centralization was mainly on the forests of India. The takeover of large areas of forest by the colonial state constituted a fundamental political, social and ecological watershed (Gadgil and Guha 1992:147).[5] While forest related-conflicts occupied center stage in the environmental discourses of India during this time, there were hardly any other natural resources which could lure the colonial state to extend comparatively similar control over such as they had done with the forests. Except for the salt movement (*Lavana Satyagraha*) spearheaded by Gandhiji in the 1930's as a response to the British salt tax, the marine and coastal resources, especially the fish economy, mostly remained under the control of local rulers with arrangements for customary access by local users.

[5] A political watershed, in that it represented an enormous expansion of the powers of the state, and a corresponding diminution of the rights of local people; a social watershed, in that by curbing local access it radically altered traditional patterns of resource use; and an ecological watershed, in so far as the emergence of timber as an important commodity was to fundamentally alter forest ecology (See Chapters 5 and 6 of Gadgil and Guha 1992).

Nevertheless, there were sporadic efforts by the colonial rulers in different parts of the country to exert State control on a variety of natural resources, including Chilika Lagoon, which is discussed in Chapter 3.

There is a strong perception that post-independent India continued the policy and governance legacy of the colonial administration with regard to the country's natural resources (Rout 2006). However, the development context has transitioned through several phases of economic policies and development models which may be seen in three broad categories based on their nature of influence and the specific time period of their origin and existence.

First, in the aftermath of independence, India was faced with the challenge of sustaining its political independence with adequate economic independence (Bardhan 1984), which was important after years of economic stagnation under the British rule, requiring a renewed focus on social and economic development (Brass 1997). Government had to choose a plan for economic growth and social development from the alternatives available during the post-independence time (Chakravarthy 1987): (1) Gandhian model of development with reliance on self-reliance, traditional skills, indigenous resources, and a participatory approach, and aimed at minimization of wants to meet the lesser supply (Mannheim 1979); and (2) Neheruvian model with a focus on the maximization of supplies to meet the increasing wants of people, with features like modernisation, large-scale industrialization, central planning, the application of advanced technology and huge capital investments drawing heavily from the experiences of the West and the Soviet Union (Kumar 2006). Though there was a clear preference for the Nehruvian model by the government, the Gandhian model was also given significance

through implementation of cottage and village industries, and its importance to the rural economy. Such a model of development created an impression that India's development relied upon both Nehruvian and Gandhian thinking (Kumar 2006).

Despite this combination, the initial development model of growth had in it the seeds of a capital-intensive economy that characterised the centralization of power, the use of advanced technology, and connection with the world economic circuit of the contemporary period (Sen 1982; Chandavarkar 1998). Although this economic policy contributed to India's industrialization and development to some degree, it also created many problems - large scale state-sponsored enterprises soon became inefficient and non-competitive, excessive government spending led to mounting deficits in the budget, modifications in the already envisaged plans which looked unrealistic (Kesavan 2003), to mention a few.

Second, further changes in development policy took place with the shift to economically liberal policies in Indian agriculture in the late 1960s (Desai 2004a and 2004b). This was the decisive point at which the crucial component of independent India's early development strategy – the social transformation of its agriculture as the basis of a sustained, broad-based and domestic capitalist industrialization in India – was pronounced a failure (Desai 2011:414). The consequent turn to progressively more market-driven policies in this sector set off the "slow-motion counterrevolution" that was neoliberalism in India (Desai 2008) which soon spread over to include other sectors of the economy. This was indeed a revolutionary shift from India's initial economic development approach and growth model.

Third, the official government acceptance of economic liberalisation as a growth model took place in July 1991 with the unveiling of the new industrial policy. As result, hitherto restricted sectors of the economy were opened up to private sectors and direct foreign investment. The initial deregulation of the 36 areas included important natural resource sectors, such as mining, that turned the wheel of "development" in modern India upside-down. India witnessed a gross change in the political-economic and external contexts within which development interventions were embedded. "Growth" (in an economic sense) became the buzzword and anything blocking its way was viewed as "anti-development" and, in many contexts, "anti-State." Of course, some perceive that the soaring rate of gross domestic product (GDP), accelerating from just 1.5 per cent in the three decades after Independence to around 8 or 9 per cent in the recent years, has put the Indian economy on the path of "freedom" and "success", however, not without intense social, cultural, political and environmental consequences.

The effects of neoliberal economic approaches were soon visible in the outcomes of how natural resource management and conservation were carried out in the country (Agrawal 2005). Concerns regarding "neoliberal conservation" focused not only on the commodification of nature but also on the marginalisation of certain caste and class groups; transformation of property rights; and accountability problems in governance (Lele *et al.* 2010). Thus, "neoliberalisation" constitutes an institutional and cultural shift toward privatization of property rights, reliance on corporate partnership, preference for market-based approaches, deregulation of the policy environment, and re-regulation of state policies to facilitate privatization and marketisation (Castree 2008a, 2008b; Brockington *et al.* 2008; Heynen *et al.* 2007).

Along with shifts in economic growth models, India has also seen its share of rising peoples' movements which are ascribed to the growing "proletarianisation" of resource users in several parts of the country. Most of these movements are seen as a reaction to loss of local control of resource management and resulting marginalization of resource users (Gadgil and Guha 1995). Some of the important movements that have come to shape the nature of independent India's environmental discourse and policies include the *Chipko*[6] movement (Bandopadhyay and Shiva 1987; Weber 1988; Guha 2000) and the *Narmada Bachao Andolan*[7] (Fisher 1995; Maiti 2005; Baviskar 2005). Resource conflicts in the tribal dominated India have also led to popular movements for separate tribal homeland, as in the case of the creation of newer states like Jharkhand, Uttaranchal and Chhattisgarh[8], all forest rich tribal regions with a history of marginalization of resource users, loss of cultural identity and relative deprivation (Kumar 2000; Majeed 2003).

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6 *Chipko* was an environmental movement by local people in the Uttarkhand region of India who opposed commercial logging. The movement is best known for its tactic of hugging trees to prevent them being cut down by contractors. It was notable because village women led the movement.

7 *Narmada Bachao Andolan* (Save Narmada Movement) is a non-governmental organisation (NGO) that mobilised tribal people (*adivasis*), farmers, environmentalists, and human rights activists against the Sardar Sarovar Dam built across the Narmada River in Central India.

8 Jharkhand, Uttaranchal and Chhattisgarh were created as new states in the year 2000 in response to prolonged regional movements based on, among other things, claims of rights over forest resources and other development related issues.

The discussions bring forth three interrelated issue. First, the role of the democratic welfare state[9] in a rapidly changing (globalising and industrialising) world: Should the state be subservient to the forces of capital or there is a welfare role based on the principles of ethics, justice, equity and sustainability to protect the interests of marginal segments in society, similar to the caste-based fishers in Chilika? Second, caste and class will perhaps continue to exist but it is important to understand that the exploitation, based on caste and class, occurs due to the influence of factors like capital acting as drivers, which needs to be addressed. Third, the state should nurture and offer leadership to form new institutions to empower marginalised communities so that they can negotiate effectively as well as can become partners in the processes of nation building. A welfare state cannot afford to neglect these questions, in the absence of which there will be a cost. Consequently, scholars focusing on political analysis observe that "even though the vast majority of India's poor have had no real - consistent and principled - political representation at all, they have registered their dissatisfaction with neoliberalism nevertheless: all Indian governments since the mid 1980s have pursued the neoliberal agenda and all have been rejected by the electorate (Desai 2004a:57)", with an exception in the 2009 elections. Despite this, there has been a surge in the ways in which the State

[9] Fundamental rights contained in part III and Dircetive Principles of state policy laid down in part IV of the Indian Constitution clarifies: The state is to strive to promote thewelfare fo the people by securing and protecting as effectively as possible a social order in which justice, social, economic and political, shall inform all the institutions of national life. In particular, the state shall direct its policy towards securing that citizens have the right to an adequate means of livelihoods; that the ownership and control of the communitiy's resources are distributed so as best to subserve the common good; that the economic system does not operate soas to cause theconcentration of wealth and means of production to teh commons detriment; that men and women receive equal equal pay for equal work; that children and young persons are protected against abuse, exploitation and neglect. Within the limits of its economic capacity and dvelopment, the state is required to make effective provisions for securing the right to work, to education, and to public assistance in case of unemployment, old age, sickness, disablement and otehr case of undeserved want.

continues to espouse neoliberalism, both in policies and practice, and Chilika Lagoon is a major example of this trend.

1.4 What are the Possible Approaches the Thesis can Take?

In making sense of changes in Chilika, what analytical lens might be appropriate for a thesis? A number of possibilities exist, some more appropriate than others. The neoliberal approach does not respond to issues of environmental justice, inequality and marginalisation; rather it tends to aggravate them. Issues like local food security do not show up in this analysis which often assumes the legitimacy of individual or corporate profits. We require approaches that deal with issues of change and marginalisation not just in the social context, but in the social-ecological context that considers the impact of environmental resources (or lack of them) on people and their well-being. Therefore, the following sections are an exploration of some alternate approaches.

1.4.1 Transformations in complex social-ecological systems

Social-Ecological System (SES) emphasizes the integrated concept of humans in nature and considers delineation between the two as artificial and arbitrary (Berkes and Folke 1998). Human actions affect biophysical systems, biophysical factors affect human well-being, and humans in turn respond to these factors (Berkes 2011). Addressing only the social dimension of resource management without an understanding of resource and ecosystem dynamics will not be sufficient to guide society towards sustainable outcomes (Folke *et al.* 2005). This implies that both social and ecological processes define and shape the nature of changes in social-ecological systems where social outcomes remain contingent upon ecological dynamics and vice-versa. Social-ecological analysis

recognizes the role of the humans in shaping ecosystem processes and dynamics (Dale *et al.* 2000; Waltner-Toews and Kay 2005), thus valuing their capacity to influence and vulnerability to be influenced by environmental change. An SES perspective also offers a clear direction for understanding human-environment disconnection in Chilika as it relates to environmental change as a cause and marginalisation as a consequence.

Social-ecological systems are complex systems. By definition, complex systems have attributes that are not observed in simple systems, including nonlinearity, uncertainty, self-organization, scale, and emergence (Levin 1999; Gunderson and Holling 2002; Berkes et al. 2003).[10] *Nonlinearity* is opposed to linear and mechanistic view of nature that prefers the system as productive, predictable, efficient and controllable and negates natural variations. Because change is rarely predictable, complex systems have the tendency to organize around one of several possible equilibrium states referred to as *uncertainty*. *Self-organization* implies that instead of instructions, there are only simple rules that govern how the system changes in response to past and present conditions. *Scale or level* refers to more appropriate structures and levels of governance which focus on the match and mismatch between the scale of management institution and the scale of ecosystem. The reason for identifying the human-environment system of Chilika as a complex system is that certain approaches have been developed to study such systems.

Social-ecological systems, such as Chilika, have many drivers, an array of impacts, unpredictable ways in which drivers act, uncertain system dynamics, and two-way feedback interactions between human and biophysical systems, using approaches

[10] For a comprehensive treatment of complex system attributes, see Holling 1986; Holling and Meffe 1996; Levin 1999; Folke et al. 2002; Berkes 2003; Berkes et al. 2003).

developed by the Millennium Ecosystem Assessment (MEA 2005). In order to understand the complexities involved, one cannot just look at a single factor but should consider all of them together. Complex SESs are defined as "systems with inherent uncertainty in their dynamics that tend to have multiple stable states and that exhibit self-organization" (Resilience Alliance 2011). Moreover, an emphasis on social-ecological perspective helps clarify that implication of analyses of SESs generally differs from analyses of social or ecological system alone (Ludwig *et al.* 2001; Westley *et al.* 2002).

In the context of Chilika, we need an approach to understand the Lagoon SES at a time when it is undergoing such large-scale changes, which also implies a possible system transformation. The unpredictable nature, pace and intensity of change and variability in the Lagoon related events and the extent of their impacts are important factors driving SES transformation in Chilika. Resilience, as a dynamic concept, deals with issues around changes in SES and its undesirable transformation. Resilience, as applied to integrated systems of people and nature, is a measure of (a) the amount of change the system can undergo and still retain the same controls on the functions and structure; (b) the degree to which the system is capable of self-organization; and (c) the ability to build and increase the capacity for learning and adaptation (Resilience Alliance 2011). In Chilika, one observes a significant loss of all of these three measures whereby when subject to disturbances or shocks it is more likely to shift into another, possibly less-desirable, state (Folke *et al.* 2002); moving it closer to a threshold and threatening to flip it from one equilibrium state to another (Berkes 2002), even when subjected to small perturbations (Levin *et al.* 1998). Therefore, resilience is an important element of how a complex SES may adapt to both internally and externally imposed challenges and thereby

buffer undesirable change. This is particularly true in the context Chilika where the instances of such challenges are not only high but also frequent, making the Lagoon SES susceptible to change.

1.4.2 Commons governance and institutions

The area of commons theory presents a well-developed literature that deals with issues of access and entitlements, as earlier mentioned in the context of Sen (1981). Criticality of commons governance is often reflected in the discussion pertaining to rules of exclusion, inclusion and subtraction. Exclusion and inclusion pertain to the decision on who is not and who is a user, whereas subtraction deals with the rules of resource distribution and allocation within the users. Based on this view, scholars have identified excludability and subtractability as two characteristics of commons. *Excludability* refers to the fact that exclusion of potential users is difficult and *subtractability* implies that each user is capable of subtracting from the welfare of all other users (Ostrom 1990; Feeny *et al.* 1990); thus they constitute key governance concerns for commons practioners. The issues of disconnection and marginalisation in Chilika are, in fact, products of an emerging confusion regarding the rules of exclusion and inclusion. A new set of actors have taken over the decision-making power in Chilika, thereby creating larger impacts on the health of the resource and existing customary resource rights.

While *excludability* and *subtractability* are important features of all commons, their successful implementation remain subject to the status of the resource itself. Without the resource, the commons will not exist, nor governance around it. Based on this view, it has been argued elsewhere that small-scale fisheries, marine and Lagoon commons can be seen as complex systems of humans and nature (social-ecological

system), the governance of which is an interdisciplinary subject (Berkes 2003, 2010; Nayak and Berkes 2011). Coastal lagoons have many drivers, unpredictable ways in which drivers act, an array of impacts, uncertain system dynamics, and two-way feedback interaction between human and biophysical systems, all of which signify complexity. Using the social-ecological system context, as discussed above, it is possible to extend our understanding of coastal lagoon commons as highly interconnected systems of humans and environment, also seen as coupled human-environment systems (Turner *et al.* 2003).

The term, human-environment system, emphasises that the two parts (human system and environmental/biophysical system) are equally important. MEA (2005) stresses the *relationship* between ecosystem services and human well-being within a human-environment context and clarifies that it is not about either the former or latter alone. *Interaction* of people with their environment constitutes the central approach in sustainability science (Kates *et al.* 2001; Levin and Clark 2010). Using this analysis, I broadly take the view that commons, in this case, Chilika lagoon, can be defined in terms of the strengths in the relationships, interactions and connections between the ecosystem and the human system. Such a view of commons specifically helps to explore how governance of commons can be studied within an understanding of these areas being complex human-environment systems, with particular attention to connections, interactions and relationships between the two. Commons are not just about resources but about human relationships (Ostrom 2009).

Lagoon commons are complex social-ecological systems. Social (human) and ecological (biophysical) processes, interconnections and cross-influence among social-

ecological system attributes, and the extent of system complexity can influence how commons is defined and governed. Lagoon commons can be seen as coupled, interdependent and co-evolutionary human-environment systems (Turner *et al.* 2003; Berkes 2011) with stress on relationships (MEA 2005), interactions (Kates *et al.* 2001) and connections (Nayak 2011) between people and their environment. Each of these possibilities have implications for how commons are managed; any form of disconnection between people and the lagoon environment may be detrimental to commons and to humans as this could be a two-way process.

The relationship of the commons and the state is another important consideration. Whether a commons is a state or non-state regime largely depends on the specific context. For example, 80 percent of Mexico's forests are in the hands of communities through two categories of land classification, known as *ejidos* and indigenous community lands (Bray *et al.* 2002) that are managed as *de jure* commons whereas fishing areas in Chilika are under community management through a *de facto* commons arrangement. In Chilika, commons exist through layers of rights; they do not need state enforcement, but they do need state recognition. Several linkages with state and non-state actors contribute to the management and governance fishery commons in Chilika. A governance perspective puts interactions – within, between and across social-ecological systems – at the heart of commons management by focusing on the formulation and application of principles guiding those interactions and care for institutions that enable them (Kooiman and Bavinck 2005). Governance can potentially take account of the diversity, complexity, dynamic, and scales affecting the ecosystem as well as human society within a commons context. In the analysis of Lebel *et al.* (2006), governance emerges through subtle norms

of interactions or even more indirectly through influencing and shaping contexts in which actors contest decisions and access resources. What is meaningful is that the essence of commons governance connects individuals, organizations, agencies, and institutions at multiple organizational levels (Folke *et al.* 2005) and must also strive to connect all of these with ecosystem processes.

Commons governance offers the tools to analyze the kinds of institutions (Ostrom 1990, 2005) that may be appropriate for maintaining connectedness between people and their natural environment, with implications for social-ecological change and marginalisation. The strength of institutions and their arrangements lie in their ability for renewal and reorganization, learning and adaptation and in dealing with change (Holling 2001). Thus, community-based institutions, not communities in themselves, can create conditions for sustainability (Berkes *et al.* 2003), only if political space is created for them (Agrawal 2002; Ostrom 2005a; Nayak and Berkes 2008). Moreover, it requires designing institutions that are capable of mediating differentiated resource access and entitlements (Leach *et al.* 1999).

Several scholars have analysed conditions leading to successful commons management. One of the general conditions pertains to the building of strong community institution as a precursor to other activities. Ostrom (1990b) suggests a number of preconditions that needs to be commonly shared among users before the initiation of collective action. They include the idea that: (1) individual exploitation will seriously harm a resource which is important to all of their survival; (2) the opportunity exists for them to coordinate their resource utilization in order to prevent the degradation to the common-property resource; (3) those participating in the management organization can

trust other members to abide by the agreed upon rules, in other words trusting others not to cheat the system; (4) the costs associated with participating in the common-property management institution is less than the benefits which members can expect as a result of their participation. Further, based on her long-standing work with community institutions, Ostrom (1990a) offers a set of eight design principles that are critical for long enduring common property institutions. They are as follows: 1) Clearly defined boundaries, 2) Proportional equivalence between benefits and costs, 3) Collective-choice arrangements, 4) Monitoring, 5) Graduated Sanctions, 6) Conflict-resolution mechanisms, 7) Minimal recognition of rights to organize, 8) Nested enterprise.

Agrawal (2002) has analyzed the comprehensive work of Wade ([1988] 1994), Ostrom (1990a) and Baland and Platteau (1996) on theoretically informed generalizations about the conditions under which groups of self-organized users are successful in managing their commons dilemma. He examined the robustness of their conclusions by comparing them with findings that a larger set of studies of the commons has identified. He records that Wade, Ostrom, and Baland and Platteau jointly identify 36 important conditions and after careful elimination of common conditions, he further refines them to, resulting in 24 different conditions. Agrawal (2002) has categorized the critical enabling conditions for sustainability on the commons under resource system characteristics, group characteristics, institutional arrangements, and external environments. The large number of variables potentially affecting the sustainability of institutions that govern common resources, thus, has important theoretical implications for future research (Agrawal 2002:66). Therefore, these principles and conditions will provide conceptual strength to the research problem at hand in Chilika.

Chilika Lagoon is an intensely contested domain as far as commons governance is concerned. At a local level, there are far reaching differences between various actors that are largely divided on caste, class, and political party lines. Even at the State level, governance of the Lagoon is problematic due to the lack of agreement between the judiciary, legislature and executive. Even though there are Court orders since the early 1990s to protect the rights of customary fishers and elimination of shrimp aquaculture in Chilika, there has not been any significant policy support to bring them into implementation. Therefore, the prospects for commons governance are unclear as much of it is caught up in politics and power dynamics. The overall political context weighs heavily in Chilika. To deal with this situation, commons governance is definitely a useful approach, but it is not completely sufficient.

Robbins (2004) argue that commons theory has developed along the lines of rational choice thinking which focuses on making decisions to maximize benefits and minimize costs and does not address values and cultural traits. Failure of collective management, commons scholars maintain, is a misnomer because there is always an opportunity to negotiate and establish appropriate systems of rules to bring resource sustainability. Therefore, rational choice was used to form an apparently apolitical theory of commons that may be insufficient to answer the commons dilemma in a long run. Johnson (2004) has proposed a somewhat related argument by dividing the commons scholarship into collective choice and entitlements schools. It is increasingly important to recognize that commons is not an isolated island of resources; rather it is situated within layers of complexities, rooted in the past, present and future discourses, and the changing

social and political circumstances across geo-physical boundaries influence its management. As Robbins argues:

> An *apolitical* theory of the commons, therefore, though attractive, is inadequate. Multiple scales of power and diverse players acting on local commons are unexamined and the multi-scale structure of the economy unacknowledged. The broader historical trajectory of socio-economic change is ignored. Moreover, by continuing to insist on the apolitical nature of the problem, such approaches to the common property problem reinforce the normative assumptions of rational choice "tragedy" approaches. Practical action is limited to internal "rule crafting", which does not challenge the more fundamental forces at work. A more ambitious and explicitly political thesis would be required (Robbins 2004: 45).

While successful commons governance has the potential to solve many problems linked to excludability and subtractability, it may not necessarily lead to justice. We cannot assume that drawing perimeter lines around hypothetical community-based resource management areas and recognizing property rights within these zones, alone, will produce justice or effective resource governance. Property rights do not constitute the necessary and sufficient conditions for justice, community control of resources, capture of benefits (Zerner 2000), or effective management of human-environment systems.

1.4.3 Political ecology and environmental justice

Political ecology tries to address the power and politics aspects generally left out by commons and other approaches, and strives to deal with these issues in relation to their influence from and on both the social-economic-political and ecological processes and dynamics. In studying community-based natural resource management systems, it is

pertinent to look at the dynamics of the larger political economy to understand the forces driving local community practices. Thus, the pursuit of successful resource management regimes necessitates a rectification to the existing myopic focus on local communities in attributing responsibility for environmental degradation (Dove 1983; Lowe 2000). Since the poor have fewer political and institutional controls over access to resources or ways of benefiting from them (Zerner 2000), a need has been expressed for recognizing the fact that the most substantive ecosystem abuses are not organized locally, but rather underwritten by a ramifying bureaucracy and business community (Lowe 2000; Zerner 2000). The essence of such a view is well captured by a political ecology approach as it offers the chance to construct more meaningful and effective forms of explaining environmental problems by emphasizing the need to understand the complex social and political influences upon how we explain such problems (Forsyth 2003) that inherently results from the dynamic changes in ecological processes.

Political ecology addresses the central questions about the relations between human societies, viewed in its full bio-cultural-political complexity, and a significantly humanized nature. Two major theoretical thrusts guide such an analysis: a) political economy, with its insistence on the need to link the distribution of power with productive activity and b) ecological analysis, with its broader vision of bioenvironmental relationship. Thus, from the perspective of political ecology, the change, disconnection and marginalisation in question may range from the very largely cultural, through the intensely political to the fairly significantly natural (Lowe 2000; Zerner 2000). Neumann (2005) identifies environmental problems as simultaneously political and ecological, social and biophysical, with a broad range of challenges for defining sustainability. The

notion of a two way interaction and cross-influence of the "social-political" with the "ecological-environmental" is a useful approach to understand critical issues in human-environment interface; more importantly, the construct of people's connection-disconnection with the resource vis-à-vis social-ecological change and marginalization. It emphasises the need to understand the complex social and political influences of environmental problems especially from the point of view of local people, marginal groups, and vulnerable populations (Forsyth 2003; Robbins 2004). .

Thus, a political ecological analysis can also have important implications for equity and justice within both societal and environmental spheres – a subject area that is mainly in the domain of environmental justice literature (Bullard 1990; Kurtz 2003; Davies 2006). The Pierre Elliott Trudeau Foundation (2011) defines social justice as "the aim of life in society is the greatest happiness of everyone, and this happiness is attained only by rendering justice to each person." While application of justice to social outcomes is a well established phenomenon, there is generally a lack of concern over "justice" in the mainstream environmental discourses which have not fully recognized the fact that social inequality and imbalances of power contribute to environmental degradation and resource depletion that disproportionately impact poor and other marginalized communities (Camacho 1998; Walker and Bulkeley 2006). Environmental justice scholarship supports examining structures, constraints and opportunities to participate in decision-making (Goldman 1993; Schlosberg 2004); issues of human rights, identity, recognition and representation (Sachs 1995; Agyeman *et al.* 2003; Schlosberg 2004); and sustainability and livelihoods (Okereke 2006; McCusker and Carr 2006). Seeing environmental issues as intimately connected to justice facilitates the development of

innovative mechanisms to deal more effectively with poverty, marginalization and environmental degradation, (ESRC_GEC 2001) all of which contribute to sustainability.

Fairness in response to environmental change involves both processes and outcomes, i.e. both procedural and distributive justice. Procedural justice relates to fairness in access to democratic decision-making by individuals, groups, or nations (Young 1990). Or, to borrow Iris Marion Young's words, procedural justice concerns "democratic decision-making procedures as an element and condition of social justice" (1990:23). Justice is intimately intertwined with the institutions and procedures of collective action at different levels of decision-making: who makes the decisions? Is environmental change a lack of decision-making or institutional failure? From the view point of distributive justice, the impacts of environmental changes are likely to be unjust as it makes resource dependent groups more vulnerable and marginalized. The impacts of unfair distribution of environmental change may have a number of implications: 1) leading to an uneven distribution impacts; 2) the levels to which people, groups and/or communities become vulnerable also gets unevenly distributed. Moreover, as Adger *et al.* (2006a) observe, actions taken to deal with such impacts also have important justice implications because their benefits and cost are frequently distributed in ways that consolidate or exacerbate current vulnerabilities and marginalization rather than reduce them.

A broad-based analysis of justice must acknowledge the significance of recognition, participation, and legitimate distribution of power (Adger *et al.* 2006b). Here, the term procedural justice refers to the degree of recognition and participation and distributive justice has connotations for sharing the beneficial and adverse impacts of

environmental change and the decision-making power linked to that (Anand 2001). Adger *et al.* (2006a) conclude "even though there is a distinction between procedural and distributive justice, the two are intimately linked in practice; without fair decision-making procedures, fair outcomes will ever be coincidental. In effect, those who are disadvantaged in terms of distribution also tend to lack voice in decision-making that affects them." Such views make it imperative to enquire into issues of both procedure and distribution concerning justice and equity in natural resources management, and, in addition, find ways to go beyond this in terms of understanding and analysis.

Even with their strong analytical focus on power, politics and justice, both political ecology and environmental justice approaches may not offer a complete set of tools to analyse issues of growing disconnection and fishers' marginalisation in Chilika. There is no doubt that they constitute critical theories with a lot of potential to improve our understanding of the Chilika situation. However, they probably lack the analytical rigour and context specific analysis put forward by the work of Ostrom (1990, 2005) and Ostrom *et al.* (1999) on commons access rights and Sen (1981) on entitlements. Political ecology shows why a problem exists but it does not deal with institutions and multilevel governance. While it has excellent tools of problem analysis, because it looks at both the historical processes of examining "why things are how they are today" and "what are their determinant factors," political ecology is relatively weak in developing approaches to problem solving. With this limitation, political ecology needs to be concerned with alternative strategies for development, and techniques of local adaptation and resistance which is a growing subject area within the literature (Peet and Watts 1996; Rosin 1993).

In addition, the political ecology approach should seek not simply to be retrospective or reactive, but to be progressive (Robbins 2004).

With regard to environmental justice, the western, urban and industrial context of its origin makes its direct applicability to other geographical contexts, especially countries in the south with largely different sets of environmental problems and consequences, questionable (Kurtz 2003; Davies 2006; Williams and Mawdsley 2006). There is a need to reflect on the relevance of the various western conceptions of environmental justice, including what it is, how it is achieved, do they provide appropriate frameworks for action, and do they take account of the complex realities of poorer countries, elsewhere in the world (Williams and Mawdsley 2006). Therefore, even though an overall application of environmental justice analysis is useful to conceptualise social-ecological system problems, its success would depend on reformulating the meanings and methods of investigation within newer contexts, such as Chilika. There is now a growing body of literature that strives to address this gap using examples from varying geographical locations of the world, especially in the context of India (Gadgil and Guha 1992, 1995; Guha and Martinez-Alier 1998; Shiva 1991, 2005a, 2005b; Williams and Mawdsley 2006; Nayak and Berkes 2010). Along with the focus on both historical and geographical contexts, the practical application of environmental justice in natural resource management depends upon moving beyond generic principles to situated understanding including how decision-making arrangements develop and the nature of the biophysical environment itself (Hillman 2006).

1.4.4 Livelihood analysis

Livelihoods can be understood as "the assets (natural, physical, human, financial and social capital), the activities (strategies of use), and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual and the household" (Ellis 2000: 10). The multiplicity of ways through which fishers in Chilika perceive their livelihood, challenges the dominant view that the concept of livelihood is about economic activities and incomes. It suggests that livelihoods in resource dependent communities are far more complex and dynamic. Chambers (1995) observed that "the realities of poor people are local, complex, diverse and dynamic. For many of the poor, livelihood seems to fit better than employment as a concept to capture how poor people live, what their realistic priorities are, and what can help them. 'Sustainable' then refers to the longer-term and 'livelihood' to the many activities which make up a living. It is a 'highly complex, all encompassing concept, which is not restricted to the ecological or to the economic or productive aspects of life' (De Haan and Zoomers 2003:350). Therefore, encapsulating the diversity and complexity of how people make a living is challenging (Marschke 2005:121). Livelihood cannot be captured fully by income accounting or consumption-based survey data (Sen 1999) or frameworks that analyze rural resource use and access to resources (Marschke 2005). It is about individuals, households, or groups making a living, attempting to meet their various consumption and economic necessities, coping with uncertainties, and responding to new opportunities (De Haan and Zoomers 2003). Individual and household livelihoods are shaped by local and distant institutions, social relations, and economic opportunities (Ellis

2000: 6). In the context of resource dependent people livelihood and the related activities are best understood as a "way of life" (Rigg 2005; Nayak and Berkes 2011).

Given the importance of livelihoods, the overall focus in the literature is on ways in which livelihoods can be made sustainable (Scoones 1998; Marschke and Berkes 2006; Allison and Horemans. 2006) which makes the concept and its implementation somewhat tricky. As Carswell *et al.* (1997:10) points out: definitions of sustainable livelihoods are often unclear, inconsistent and relatively narrow. Without clarification, there is a risk of simply adding to a conceptual muddle. Scoones' (1998:5) observation that "the growing body of literature is not particularly clear on the question of what a sustainable livelihood is. Also, the existing literature provides little clarity about how contradictions between wide sets of issues and relationships are addressed and trade-offs are assessed. Recent work has focused on various factors that impinge upon livelihoods including shocks and stresses (De Haan 2000; De Haan and Zoomers 2003, 2005); fluctuations in resource status and dynamics linked to resource use and access (Marschke and Berkes 2006); drivers at multiple scales that influence livelihood context (MEA 2003); impacts of interactions between global and local forces and contexts (Armitage and Johnson 2006); influence of poverty on livelihoods (Bebbington 1999; Bene 2003); use of resilience (Marschke and Berkes 2006) and well-being (White and Ellison 2007) to understand challenges making livelihoods sustainable. However, a more complete understanding of sustainable livelihoods still remains a work in progress. However, the livelihoods approach avoids the compartmentalization of people's lives caused by a pre-occupation with intra-sectoral analyses. The core principles of the approach have been widely adopted and as an analytical tool or way of thinking about the causes of poverty it has

been influential (Neiland and Béné 2004; Andrew *et al.* 2007). Scholars have offered frameworks and approaches to analyse various strategies for making livelihood outcomes sustainable (Scoones 1998; Bebbington 1999) which has been further elaborated in Chapter 5.

1.4.5 Conceptual approach to comprehend Chilika SES complexity

My discussion has shown that the processes associated with change, disconnection and marginalisation in Chilika SES are complex. I have also considered a number of theoretical and conceptual areas in order to find relevant approaches to deal with complex problems in the Lagoon SES. From my review of a number of theoretical and conceptual areas, I have found a possible gap, which is the lack of a satisfactory approach and guidance in any single theory to understand a systems problem such as the one found in Chilika. There are strengths and weaknesses in each of these theory areas; strengths that could enable an approach to address specific aspects of the problem in Chilika and weaknesses that could push towards finding alternate approaches to fill the remaining gaps. Obviously, none of the theory areas considered can function as a standalone approach to understand the situation in Chilika; therefore, a basket of approaches was considered to analyse the Chilika Lagoon situation. Consequently, it constitutes a multi-lens approach to the interconnected system of people and environment as opposed to any unifying theory or a single integrated theoretical approach to problem solving. Finding the gaps in the approaches of different theory areas and visualizing their application to deal with specific aspects of the problem is an innovation in this thesis.

While commons theory provides an entry into the areas of collective action and institutional interventions to secure access and commons rights, political ecology adds

value by asking critical questions linked to the differentiated resource control, power dynamics, entitlements and politics of governance. Both approaches help retain a critical focus on understanding how access, property rights and entitlements of the fishers have shrunk historically over time and with what consequences. Political ecology dimension on governance of complex SESs enables a set of questions by asking about power, control and decision-making processes by focusing on "who has the power, who controls and who takes decisions, and with what consequences." An environmental justice and equity angle is important because of its focus on the procedural and distributional aspects of commons management and ability to define how commons outcomes influence social structure and possibly impact ecosystem processes. It tries to capture various dynamic processes linked to the issue of human-environmental disconnection and marginalisation. The environmental justice approach helps formulate a set of questions that deals directly with the various dimensions of marginalization - political, social, economic and environmental - and focuses on elements of justice and equity by asking "how resource benefits are distributed across stakeholders, and how decisions on commons influence social structures." From the type of questions they ask, it is evident that both political ecology and environmental justice could be used as crosscutting themes in the discourse of complex system dynamics. I use complexity and social-ecological systems perspective as an overall approach to strengthen the orientation of the research in the direction of understanding Chilika Lagoon as a complex system of humans and the environment. Further, it helps to connect various theory areas by making complexity a common thread amongst them and also makes it possible to look at multiple levels of analysis, multiple realities and, therefore, provide multiple ways of addressing complex SES problems.

Thus, the use of different theoretical approaches in this thesis follows a pattern. Each chapter draws primarily from one particular theory area and makes secondary use of other approaches, based on need, in its attempt to analyse one particular aspect of Chilika problem: (1) The political ecology framework is used as an analytical approach in Chapter 3 to explore and conceptualise the paradox of marginalisation resulting from differing views of the government and local fishers on the social-ecological conditions. Chapter 4 uses commons theory to explain the formation and loss of property rights regimes in Chilika and organize a theoretical construct to comprehend commons as a process, better understood as commonisation and decommonisation. The livelihoods approach offers a basis for extensive analysis of fishers' livelihood crisis, strategies, outcomes and future scenarios in Chapter 5. Approaches for institutional analysis have been used in Chapter 6 to explain the governance failure in Chilika and analyse prospects for multilevel institutional arrangements.

1.4.6 A conceptual framework

Environmental change has become a pervasive force in a complex and highly globalized world. The "change" in question has tremendous influence on the complex human-environment interactions, often contributing to the growing separation or disconnection of the "human" from the "environment." Both change and disconnection have tendencies to set forth processes of marginalisation, especially so in the context of resource dependent communities. The focus of my thesis is on this triad of change-disconnection-marginalisation within the context of human-environment system, and with specific attention to the inter-linkages and cross-influences among them (**Figure 1.1**).

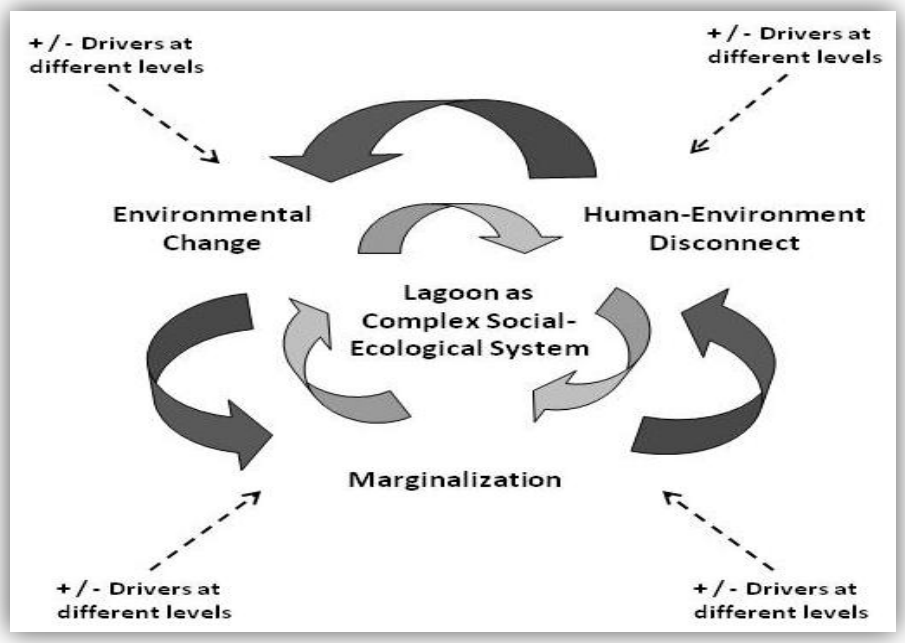

Figure 1.1: Triad of change-disconnection-marginalisation within the context of complex Lagoon Social-Ecological System

Figure 1.1 is not a model, but a conceptual frame. It sketches the main components and interactions (the arrows) of the system studied. The figure tries to conceptualize this triad by considering Chilika Lagoon, Odisha, my study area, as a complex human-environment system (also termed as social-ecological system, SES). The triad of change-disconnection-marginalisation functions through feed-back loops and impacts the SES. There are external drivers[11] at multiple scales which impact the SES by first influencing its attributes (three factors in the triad). The nature of impact from the external drivers may be positive or negative depending on the character of the driver itself. Plus and minus signs in the figure signify the character of the driver either as positive or negative respectively. Since environmental change, human-environment

[11] I use drivers as defined by the Millennium Ecosystem Assessment (2003) - Drivers generally refer to any natural or human-induced factor that directly or indirectly causes a change.

disconnection and marginalisation move in a cyclic process, we do not know which of the three attributes receives the first impact from the external drivers and then moves through the SES influencing other attributes. Depending on which attribute first received the impact the sequence of influence among the attributes in the triad would change. Considering **Figure 1.1**, six different sequences in the triad are possible: (1) change-disconnection-marginalisation, (2) disconnection- marginalisation-change, (3) marginalisation-change-disconnection, (4) change- marginalisation-disconnection, (5) marginalisation-disconnection-change, and (6) disconnection-change-marginalisation.

Thus, the framework may be useful in defining the range of problems and the sequence in which they tend to appear in specific social-ecological contexts. Using Chilika as a case, the thesis postulates that disconnection in the relationship between people and their environment is related to the question of marginalisation and that this is probably a two-way feedback process. Environmental change acts as a driver of both disconnection and marginalisation and, depending on the context, can also be influenced by these two dynamic factors. Using this triad of change-disconnection-marginalisation, I argue that it is possible to define any one of these factors by using the other two as a basis of analysis. However, with a specific focus on understanding marginalization, the thesis explores whether marginalisation could be defined in terms of people's connection or disconnection with the environment with particular attention to resource-based communities. It postulates that, in order to seek an answer to the question of marginalisation, we need to examine many issues linked to the elements of connection or disconnection within a human-environment system. In other words, it proposes to explore how the understanding of marginalisation in resource-based communities is linked to the

level of connection of people with the resource environment, and the changes associated with it.

I approach the triad by focusing on the multi-level drivers and processes of environmental change in Chilika Lagoon to determine implications of such change for social-ecological marginalisation of fisher communities. In doing so, I examine the concept of marginalisation as analyzed and understood by the local fishers, but often challenged by those in power. I consider that the key question is not marginalisation *per se,* but the challenge of keeping people connected, or reconnecting them to the resource-base and the larger environment. How do we achieve this? The thesis theorizes that (a) understanding the context specific history and politics with attention to issues of power, equity and justice offers a key foundation, (b) resource access, entitlements, commons rights and control of people over their environment are essential determinants, (c) livelihood analysis is central to the human-environment connection, and (d) a promising approach is to build appropriate multilevel institutional arrangements with scope for linkages and partnerships.

1.5 Purpose of the Research

The overall purpose of the research is **"to determine and explain the processes and factors responsible for change in Chilika Lagoon fisheries and the implications of such change for fishers' disconnection with the Lagoon and their marginalization."**

1.6 Research Objectives

1. To account for the historical and political context and processes of change in Chilika fisheries.
2. To analyze how access, commons rights and entitlements have changed historically.
3. To analyze livelihood processes in Chilika fisher communities that is in transition to marginalization.
4. To examine institutional linkages across levels of social and political organization that promote (or hinder) decision-making concerning Lagoon management.

1.7 The Field Context

The State of Odisha (**Figure 1.2**), located in eastern India, is known for its vast natural resources and a large rural population. The research was conducted in Chilika Lagoon, India (**Figure 1.2**). Chilika Lagoon, locally called Chilika Lake, is the largest lagoon in India and one of the largest in Asia, with an area of 1165 km^2. It is located in Odisha State on the east coast of India on the Bay of Bengal. Chilika is a Ramsar site wetland of global conservation importance, and a productive area with a fish fauna adapted to a mix of freshwater and seawater that characterises lagoon ecosystems. The shallow and sheltered waters of Chilika are also suitable for aquaculture, especially for the intensive production of the lucrative tiger prawn (*Penaeus monodon*) that naturally occurs in these waters.

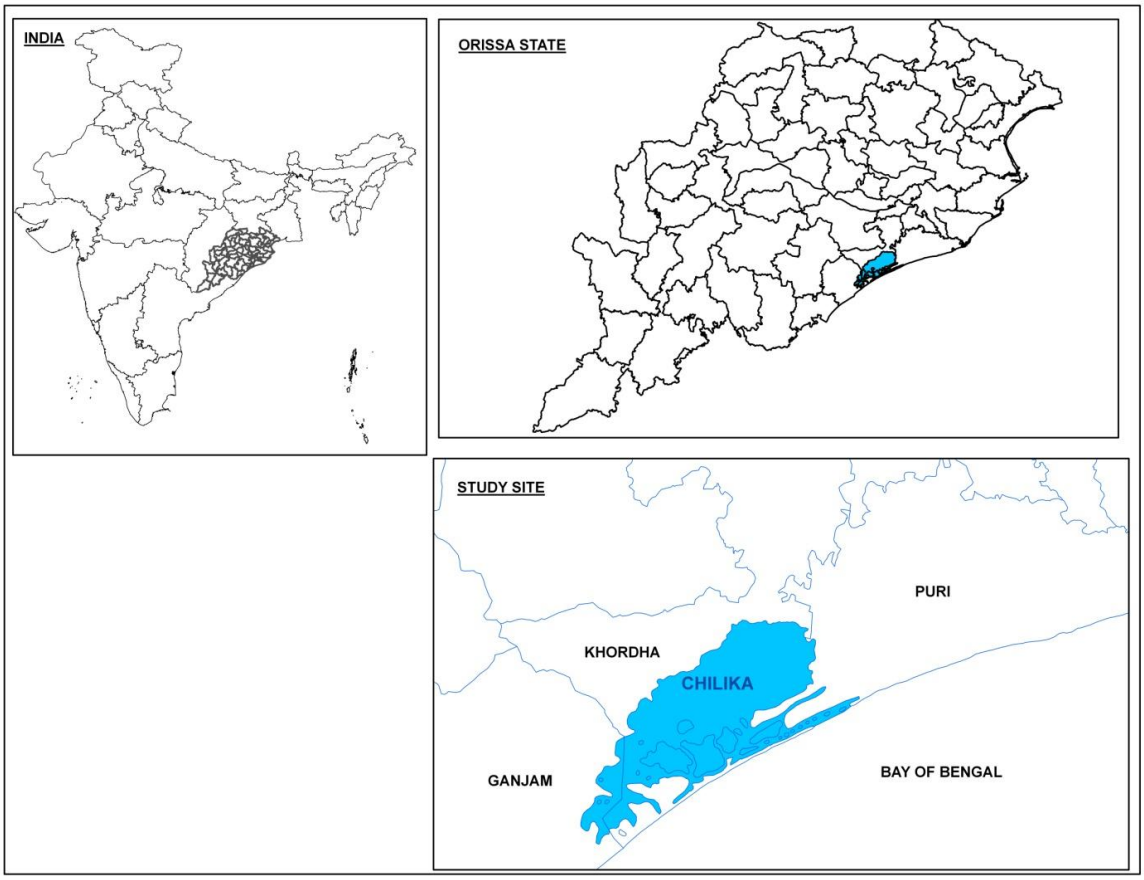

Figure 1.2: Location of Chilika Lagoon, Odisha, India

Chilika boasts of a rare mix of estuarine, marine and freshwater ecosystems. It is one of the hotspots of biodiversity, both nationally and internationally. Some rare, vulnerable and endangered species listed in the IUCN Red List of Threatened Animals inhabit the Lagoon. The total number of reported fish species is 225. Along with a variety of phytoplankton, algae and aquatic plants, the Lagoon region also supports over 350 species of non-aquatic plants. A phytodiversity survey by Chilika Development Authority (CDA) in 2002 identified 710 plants in Chilika (within the water body, including the Islands and shorelines). A survey of the fauna of Chilika carried out by the Zoological Survey of India in 1985-87 recorded over 800 species in and around the Lagoon. This list includes a number of rare, threatened and endangered species, including the Barakudia

limbless skink. It is the largest wintering ground for migratory waterfowl found anywhere on the Indian sub-continent. The Nalaban Island within the Lagoon is notified by the State Government as a Bird Sanctuary under Wildlife (Protection) Act. The National Wetlands, Mangroves and Coral Reefs Committee of the Ministry of Environment and Forests, Government of India has also identified the Lagoon as a priority site for conservation and management.

Apart from its rich biodiversity, Chilika is also known for being a highly productive ecosystem with rich fishery resources. More than 400,000 fishers, belonging to specific caste groups[12], customarily depend upon the Lagoon for their livelihoods. These fishers live in approximately 150 villages in and around Chilika. The Lagoon ecosystem also supports approximately 800,000 villagers in the watershed area of the Lagoon. These non-fisher communities engage in cultivation, depend on forests and undertake other occupations for their livelihoods. However, owing to large-scale forest degradation and land not being suitable for paddy cultivation, subsistence based on agriculture and forests are on the decrease. This has meant that a number of non-fishers have now turned to fishing, mainly aquaculture, as a growing source of income. However, the fishers are caste-based, meaning that the fishery consists of traditional fisher groups whose vocation is identified by their membership in certain Hindu castes. Many fisheries in India are dominated by such traditional fishers and their community and caste organisations. However, caste-based fisheries are under pressure in various parts of India, and other groups are entering the fishery (Lobe and Berkes 2004; Coulthard 2008) and Chilika is no exception to this growing trend.

[12] There are seven different types of fisher castes and sub-castes in Chilika. A detailed profile of fisher caste groups in the Lagoon is given later in **Table 3.2.**

1.8 Research Approach and Methods

The study was carried out over a period of 28 months during 2007-09 using qualitative and participatory research approaches (Creswell 2003; Johnson and Onwuegbuzie 2004). The study also generated quantitative data in terms of numbers without any use of statistical methods. Three sets of data collection methods were used: (1) a variety of surveys involving fisher villages and households, (2) consultations and interviews across multiple stakeholders, and (3) accessing secondary data sources including both village records and policy documents. I did a rapid reconnaissance survey of about 60 fisher and non-fisher villages around Chilika Lagoon to get a perspective of the situation. Discussions with a number of NGOs, research institutions, government departments, Chilika Fishers' Federation and key individuals added to this experience. Based on some preliminary findings, a list of nine criteria[13] were drawn for selection of two study villages, Berhampur and Badakul (**Figure 1.3**), and a household survey questionnaire was developed, field-tested and revised before being used. Surveys were undertaken at three different levels: (1) household (N = 160) survey in two selected fisher villages, (2) monthly household-level (N = 30) monitoring, and (3) general survey in fisher villages (N = 150)[14].

Several consultations and interviews with multiple stakeholders were conducted. Village elders, some of whom are actively involved in fish cooperatives, were important

[13] Village selection criteria included caste, occupation, impact of aquaculture and new sea mouth, problems related to fishing area lease and encroachment, loss of fishery-based livelihoods, rate of out-migration and status of village cooperative and traditional institutions.

[14] Even though general village survey was done in 150 fisher villages, only 140 village survey results were used for analysis in this thesis due to inconsistent and incomplete data sets available for ten villages.

sources of information. Interviews with the members of the village institution were conducted, and focus group discussions were held to elicit views of women and other vulnerable groups. Views of NGOs, relevant government departments, political representatives, fish traders, officials of the tourist boat associations, and representatives of fishers' federation were collected to understand perceptions of a cross-section of stakeholders. Four one-day policy workshops were organized with selected representatives from various fisher villages of Chilika to discuss and come up with recommendations on specific issues linked to the Lagoon management. Over the long-term, interviews, focus groups, and other participatory exercises had a representation from over 70 percent households in Berhampur and 100 percent households in Badakul. A number of these exercises were also conducted outside the two study villages, including both fisher and non-fisher villages in Chilika.

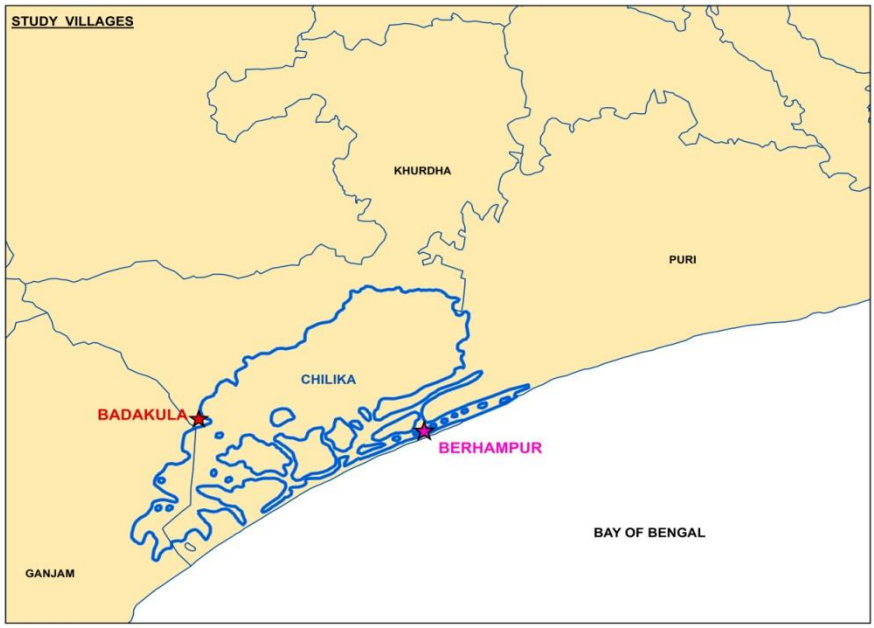

Figure 1.3: Location of study villages - Berhampur and Badakul - in Chilika Lagoon

A wide variety of secondary data sources were accessed. Written records of village institutions / cooperatives, account books of fish traders, records of tourist boat associations, and proceedings of fishers' federation were studied. Village historical records going back to 1957 on fishing area lease rights were collected and analysed from the fisheries department. Government orders, legislative assembly proceedings, development plans and other policies concerning Lagoon management at the district, state and national levels were analysed to understand the overall policy and administrative environment.

1.9 Significance of the Thesis

The theoretical significance of this study is related to the understanding of complex system problems through innovative approaches that transcend disciplinary boundaries. The analysis in this thesis builds on the idea that there cannot be a "single solution or blueprint" (Ostrom *et al.* 2007) or a "one-size-fits-all" (Berkes 2003) approach for dealing with environmental change, human-environmental disconnection and marginalisation. Consequently, a number of theoretical areas have been considered with the realisation that no one single approach would be sufficient. Consequently, the main contribution of this study is to the intersection of bodies of literature through combining critical inputs from a host of theoretical areas to develop a multi-lens approach. The intent of the thesis was to make specific contributions to scholarship in the following areas:

1. By focusing on poor fishers and their marginalisation, the thesis will attempt to further the work of Narayan *et al.* (2000a) who advocates the importance of voice and

power in poor people's definition of their own situation. It will make particular contribution through conceptualising a more inclusive, people-oriented definition of marginalisation that expands our conventional views of this complex and multidimensional concept, and also by clarifying the necessary methodological tools to do this.

2. While lagoons are complex adaptive systems, they are not "infinitely complex" (as Holling would put it, pers. comm.). The thesis will conduct a diagnosis of complexity in Chilika social-ecological system through examining the critical linkages between environmental change, human-environment disconnection and fishers' marginalisation, along with the impacts of several external drivers across multiple scales, to develop a novel approach to comprehend social-ecological system complexity.

3. There exist a number of scholarly concerns regarding conventional commons theory: Johnson (2004) observes a normative and methodological tension within the commons literature by categorising commons scholarship into collective action and entitlement scholars; Robbins (2004) sees commons theory being significantly *apolitical*; Berkes (2006) points at a comparative lack of understanding of commons as complex adaptive systems comprising humans and environment. The thesis will address these gaps in the commons theory, with the emphasis that commons is not a fixed state of resources and institutions. A particular contribution of the thesis to commons scholarship will be to develop a conceptual understanding of commons as a process.

1.9.1 Applied perspective

In addition to its theoretical orientation the thesis rests on the strengths of 28 month-long intensive fieldwork in Chilika Lagoon. A strong combination of both theory and field research has the potential to take this work beyond the usual academic boundaries by enhancing its practical and policy relevance. Efforts were already made during the field research to contribute to the ongoing policy debates on Chilika Lagoon and to verify that the findings could actually become a catalyst for positive change not only for the marginalized fishers but also for coastal and lagoon policies and governance as a whole (**Annexures I and II**). This applied perspective is consistent with the objective of the Pierre Elliott Trudeau Foundation, the main funder of my project, with its emphasis on social justice.

1.10 Organisation of the Thesis

The thesis is organized into seven chapters, followed by a list of references and seven appendices. Each chapter has its own distinct format based on the issue it addresses and its position in the flow of the thesis. For example, Chapters 1 and 2 provide theoretical and methodological orientation to the thesis and offer conceptual and practical background to the discussions whereas Chapters 3, 4, 5 and 6 combine theoretical concepts with research findings, much like an academic paper. Even though there are overlaps, Chapters 3, 4, 5 and 6 correspond to the research objectives 1, 2, 3 and 4 respectively. Chapter 7 pulls material from all other chapters to evaluate the research outcomes and their relevance for academic, policy and applied work. The following explains some specific details on what each chapter contains.

Chapter 1 sets out the theoretical context for this research, the research purpose and objectives, and offers conceptual orientation to the analysis. Chapter 2 then explains the philosophical and methodological approaches that have guided the research process and outlines the specific field research methods used. Chapter 3 provides a short account of the historical and political background to the processes of environmental change in Chilika Lagoon fisheries and its implications for fishers' marginalisation. Chapter 4 explores the question of "how to keep commons as commons" in the face of growing challenges from external drivers through analysis of various contributing issues and dynamics associated with the processes of commonisation and decommonisation. Chapter 5 develops an understanding of social-ecological change in Chilika from a livelihood perspective and examines various strategies and outcomes to clarify how the fishers negotiated with livelihood crisis. Chapter 6 deals with the institutional arrangements and processes in Chilika Lagoon and explores alternate ways to bring a new institutional balance and achieve a more functional but equitable multi-level institutional network based on polycentric governance arrangement. Chapter 7 concludes this thesis by revisiting the research objectives and presents key findings and conclusions with attention to their relevance to theory and practice, including policy.

Profile of Chilika Lagoon on a tourism display board
Needs a reminder: "Chilika is also home to half a million fishers"
Photo: Prateep Nayak

CHAPTER 2

STUDY METHODS AND AREA:

WORKING IN AND WITH THE CHILIKA FISHER COMMUNITY

2.1 Introduction

Chapter two outlines the general research orientation and the specific research methods used in the study. It deals with some of the challenges of doing interdisciplinary research in a participatory format which involves local communities in a contentious situation, especially with regard to aquaculture development. Approaches and methods that are: (1) holistic in nature; (2) support analysis of social-ecological systems; (3) help understand complexity; and, (4) facilitate the use of principles of social justice, equity and power as crosscutting themes for the investigation of social and environmental phenomena, were considered critical for this research.

In social-ecological research it is important to consider that methodologies are often closely linked to the specific issues and questions a study is attempting to address. Most issues are critically entrenched in the historical dynamics of the people and the locality, and they often tend to carry implications for the research. Thus, there is a need to analyze and understand the context within which such issues emerge and persist. The chapter starts with outlining the philosophical and methodological approaches used in this research. The process of research is discussed with details provided on how the study was set up and how it progressed through a number of key activities in the field. Following the process, I discuss the specific research methods used for data collection, recording and analysis. I conclude the chapter with a few observations.

2.2 Philosophical and Methodological Approaches

Three interrelated approaches provided an overall philosophical and methodological basis for the research. They included pragmatism, qualitative and participatory approaches as defined by Creswell 2003, 2007). Even though these three approaches are connected from a philosophical and practical point of view, I discuss them separately for the purpose of clarity. I start with pragmatic followed by qualitative and participatory approaches. Based on these approaches, the thesis relies on a mix of methods and multiple sources of data, sometimes referred to as triangulation (Bogdan and Biklen 2006; Altrichter *et al.* 2008). The multiple sources of information make it possible to check for consistencies (and inconsistencies) in the information provided.

2.2.1 Pragmatic approach

Situated in positivist philosophy, quantitative approaches maintain that research inquiry should be "objective". That is, time- and context-free generalizations are desirable and possible, and real causes of social scientific outcomes can be determined reliably and validly (Nagel 1986). According to this school of thought, researchers should eliminate their biases, remain emotionally detached and uninvolved with the objects of study, and test or empirically justify their stated hypotheses. In contrast, Johnson and Onwuegbuzie (2004) observe that qualitative researchers, positioning themselves with the paradigm of constructivism and interpretivism, reject positivism. They argue for the superiority of constructivism, idealism, relativism, humanism, hermeneutics, and, sometimes, postmodernism. A qualitative school of thought contends that multiple-constructed realities abound, that time- and context-free generalizations are neither

desirable nor possible, that research is value-bound, that it is impossible to differentiate fully between causes and effects, that logic flows from specific to general (e.g., explanations are generated inductively from the data), and that knower and known cannot be separated because the subjective knower is the only source of reality (Guba 1990).

Out of this dispute emerged pragmatism, which is recognized as an alternative way of looking at research (Creswell 2003, 2007). According to Johnson and Onwuegbuzie (2004), philosophically it is the "third wave" or third research movement, a movement that moves past the paradigm wars by offering a logical and practical alternative. Its logic of inquiry includes the use of induction (or discovery of patterns), deduction (testing of theories and hypotheses), and abduction (uncovering and relying on the best of a set of explanations for understanding one's results). Pragmatic approaches to research are an attempt to legitimise the use of multiple approaches in answering research questions, rather than restricting or constraining researchers' choices (i.e., it rejects dogmatism). It is an expansive and creative form of research, not a limiting form of research. It is inclusive, pluralistic, and complementary, and it suggests that researchers take an eclectic approach to method selection and the thinking about and conduct of research (Johnson and Onwuegbuzie 2004; Creswell 2007). What is most fundamental is the research question - research methods should follow research questions in a way that offers the best chance to obtain useful answers.

I found the pragmatic approach the most appropriate alternative in seeking answers to my research questions as it recognizes the existence and importance of the natural or physical world, as well as the emergent social and psychological world that includes language, culture, human institutions, and subjective thoughts. The pragmatic

approach was particularly useful in investigating human-environment interactions which is a focus in my research. Moreover, a pragmatic approach places high regard for the reality and influence of the inner world of human experience in action (Creswell 2007). Knowledge is viewed as being both constructed and based on the reality of the world we experience and live in. It takes an explicitly value-oriented approach to research that is derived from cultural values; it specifically endorses shared values such as democracy, freedom, equality, justice and progress. It endorses practical theory - theory that informs effective practice. In my view such an overarching approach can prove critical in conducting research in a complex social-ecological setting that throws up equally complex issues to consider.

2.2.2 Qualitative approach

A qualitative research approach has a number of advantages over others. It is useful for describing complex phenomena as they are situated and embedded in the local context, thus enabled me to study dynamic processes in Chilika social-ecological system. I found that qualitative approaches were responsive to local situations, conditions, and stakeholders' needs and to the changes that occurred during the conduct of the study thereby allowed shifts in the original focus of the study to incorporate emerging new realities in the field (Johnson and Onwuegbuzie 2004). However, a qualitative approach also runs the risk of being time consuming and there are chances that the results are more easily influenced by the researcher's personal biases and idiosyncrasies. Irrespective of these factors, Creswell (1994) has emphasized that there are several possibilities available to the researcher in qualitative research approaches which makes it one of the preferred methodological approach. In his view a qualitative approach:

1. Is concerned with process rather than products or outcomes.

2. Is concerned with meaning, (i.e. how people make sense of their lives, experiences, and structures of their world).

3. Considers the researcher as a primary instrument for data collection and analysis.

4. Necessitates fieldwork, allowing the researcher to observe behaviour and conditions in a natural setting.

5. Focuses on description because understanding is gained through words, pictures and other mediums.

6. Is inductive in nature, i.e. the researcher builds abstractions, concepts, hypotheses, and theories from details observed.

2.2.3 Participatory approach

Within the definition of qualitative research the study adopted a set of participatory approaches. The conventional questionnaire methods suffer from several problems such as identification of important research issues and their relevance to local people, invariably large numbers of questions, and the long time period to administer. In contrast, short field visits are full of biases and may misguide researchers into believing they have seen an accurate picture of the field reality (Pretty and Vodouhe 1997). These biases could be categorized into: spatial biases, time biases, people biases, and project biases (Chamber 1983). Owing to these flaws in conventional approaches, there has been a recent rapid expansion in participatory approaches (Pretty and Vodouhe 1997).

Irrespective of the different terminologies used to denote participatory approaches, they are all interlinked through a set of common principles (Pretty 1994): 1) defined methodology and systemic learning process, 2) multiple perspectives, i.e. objective is to seek diversity, 3) group learning processes, i.e. recognition that the complexity of the world will only be revealed through group inquiry and interaction, 4) context specificity, 5) facilitating experts and stakeholders, (i.e. role of the "expert" is best thought of as helping people in their situation to carry out their own study), 6) leading to sustained action, i.e. learning process leads to debate about change which positively influence perceptions of the actors and their readiness to contemplate action. Scoones (1995) has discussed ten myths about participatory approaches that provided a conceptual base to my research methods as well as acting as a set of basic ground rules during the course of the research.

Implementation of the participatory approach in the field required a number of activities. The selection of specific study communities was done in collaboration with local fishers, the Fisher Federation and village institutions. Introductory workshops to discuss the study design and its implementation process were conducted. Use of participatory methods offered the opportunity to implement a number of practical and experimental research tools such as social and resource mapping, institutional analysis, trend analysis, historical transect, matrix ranking. The diversity of these tools helped situate the research in the past, present and future. As part of these participatory approaches, household and individual interviews, community workshops and focus group discussions were organised to collect specialised information from specific gender, caste and economic groups who have different experiences and perceptions with regard to the

Lagoon. Moreover, it is often a complex process to get all the diverse groups together within a rigid social and cultural context that characterise rural areas of Odisha. Overall number and time duration of various research methods are summarised in **Table 2.1**.

Table 2.1: Methods of data collection, duration of time and numbers

Field methods / techniques	Time duration	Total numbers
Reconnaissance survey	March - May 2007	60 fisher and non-fisher villages
Preliminary meetings / interviews	March – May 2007	27 individuals and institutions
Household survey	July 2007 - February 2008	157 fisher households in two villages
Household livelihood monthly monitoring	January 2008 - June 2009	30 fisher households in two villages
General village survey	April 2008 - September 2008	150 fisher villages (one questionnaire per village)
Interviews	April 2007 - September 2008	329 individuals, institutions, and survey households
Focus Groups	June 2007 - August 2008	27 meetings involving groups of women, fish traders, boat and tourist associations, fisher federation representatives, ice factory owners association
Process documentation of the meetings of Chilika Fisher Federation	July 2007 - August 2008	9 meetings of the Chilika Fisher Federation mainly as an external observer
Workshops	February - August 2008	6 involving specific topics with selected fisher groups or their leaders
Secondary information collection including library and archival work at Bhubaneswar (state capital)	Different days throughout the research duration	Policy documents from government departments, historical records from state archive and state library, Assembly proceedings from Odisha Legislative Assembly, publications from NGOs
State level policy workshop	September 6, 2008 (excluding several days of preparation time)	72 participants including 40 representatives from Chilika fisher villages, NGOs, academia, activists and researchers, political parties leaders, print and TV media

2.3 The Research Process

2.3.1 Ethical considerations

2.3.1.1 Identity, anonymity and confidentiality

During any field interaction the participants identified themselves by their individual names. Self-identification by the participants was primarily seen as part of the local culture where it is customary to introduce oneself to outsiders by name and also institutional designation, as in the case of members of the fisheries cooperatives. However, no individual participant was forced or motivated, in any way, to disclose her/his name if she/he choose to stay anonymous. As a principle the original names of the participants were protected by a measure of anonymity. The names of the participants were only used in order to clarify or verify data during the field research period. In the thesis and other published documents a two-pronged approach was adopted to deal with the identity of the participants: (1) as a general ethical principle, pseudonyms were used for all women fishers to be compatible with local cultural practices and as a measure of extra care given the sensitivities associated with issues of women in a conservative rural *Odiya* society, (2) with regard to male fishers, a mix of real names and pseudonyms have been used under the proviso that verbal consent was received in all cases where real names have been used. The men in the fisher society, especially those in village and regional leadership positions, prefer to have their names associated with their statements, and I have honoured this. However, I have taken particular care to protect those fishers who may be vulnerable by applying the principle of anonymity and the use of pseudonyms.

All data and names of research participants are currently under my care and stored in a secured location. Once the research is finally complete, all records containing the participants' names will be either blacked out or shredded. The same measure will also be taken in case of digital records by deleting the participants' names from such records after the research is over. Since I speak and understand the local language at the study site, no translator or transcription assistance was used for this research, which helped to maintain confidentiality in the research process.

2.3.1.2 Informed Consent, care for deception and feedback

Consent of the community was obtained through a letter written in the local *Odiya* language. A copy of the letter in English has been attached as **Annexure III** The Odiya language letter was read to the participants or, in some cases, the summary of the letter was explained, at the beginning a meeting or interview. The participants were asked to verbally confirm that they understood the purpose and content of the letter and consent to participate. Signatures were not taken as it was not suitable for the culture and/or literacy level of all participants. Thus verbal consent was the main method used. Participants were also told that they had a right not to respond to questions or to stop the interview at any time. Deception, in any form, was not part of the research. Steps were taken to share analyzed data and information with fishers and other people in periodic meetings during the research and regular feedback obtained from them to highlight the participatory nature of the research. The research dealt with human subjects only and there were no risks, direct or indirect, involved beyond those associated with normal activities. No financial compensation was paid to the participants in the research activities. However, small community and group feasts were organized in accordance with the local culture.

Moreover, provision of food was made in all community workshops and group discussions that lasted more than half a day.

2.3.2 Reconnaissance survey and initial acquaintance

I realised that my observations during the first two days in the field required further verification with the wider community in Chilika. In my view, this was necessary in order to draw some initial conclusions upon which my research could bring specific focus to important issues regarding fisheries in the Lagoon. I assumed that a process of verification would not only confirm or reject the validity of the observations but also bring in newer dimensions to their understanding. As said, I conducted a reconnaissance or an overview survey through preliminary village visits during the first three months (March - May 2007) of the research. This was an opportunity to talk to a variety of community members across Chilika that brought attention to wide ranging topics and issues. A deliberate attempt was made to elicit the views of both fishers and non-fishers in Chilika. As a result, the reconnaissance survey covered a total of 60 fisher and non-fisher villages. A preliminary list of about 8 to 9 villages were made and names of other villages came up as we visited these selected villages, and also from our interactions with other people in the area.

Most village visits were informal and made without any prior notice to the village. Pratap (my community research assistant) and I walked into these villages and spent between 2 hours to a whole day (per village) talking to several village leaders and other villagers, meeting the full village committee in some of the villages, visiting their customary fishing areas, looking at the village records (on several occasions actually

borrowing those documents for photocopying), and, in a few instances, spending some recreational time with the village youth, either to play volleyball or cards. These interactions turned out to be crucial as we discussed the research objectives with the villagers and received critical inputs for changes and improvements. During these initial interactions with people, our distinct identities – Pratap being a fisher himself from one of the well known fisher villages in Chilika and me as an *Oriya* (belonging to the same state) who spoke the local language - were exceptionally useful. During the reconnaissance survey, we were able to audio record all our interactions with the villagers. Extensive notes of the meetings were taken, and we were able to make contact with several village leaders with whom I continued to interact throughout the rest of the field research.

Along with the reconnaissance survey, a series of preliminary meetings were held with several people and institutions with the intention to gather a diversity of views on the situation in Chilika. Prominent among these meetings were interactions with the leaders of the Chilika Fisher Federation, selected NGOs and government departments including Chilika Development Authority (CDA) and Odisha State Fishermen's Cooperative Federation Ltd. (FISHFED), researchers and academics in Bhubaneswar, and a few fish traders.

As expected, a wide range of information was gathered through the reconnaissance survey and other initial contacts that not only confirmed the validity of my observations but also brought in other insights to provide a more complete picture of the situation in Chilika. Before proceeding any further, I used the information to write up

a few quick "case studies", each of which focused on one of the critical issues facing the Lagoon and its people (**Table 2.2**). Creating these case studies was an attempt to segregate available preliminary information and data as per their relevance to specific issues, with minimal analysis, so that they could be used as "fact sheets" in the course of the field research.

Table 2.2: List of major issues that emerged from the reconnaissance survey

Major issues
• Fishing area lease
• Impact of new sea mouth
• Shrimp aquaculture
• Out migration
• Weakening of village-level fisheries cooperative (PFCS)
• Fishers' federation
• Eco-tourism
• Fishing related conflicts

2.3.3 Criteria and selection of study villages

While the reconnaissance survey was useful in getting a broader perspective on the situation in Chilika and identifying important issues, there was also a need for a deeper understanding and analysis of the same issues in specific village contexts. I was also clear on the need to focus on customary caste-based fisher villages, as compared to higher caste non-fisher villages, for the main part of data collection that involved household surveys. The term "customary caste-based fishers", in its Oriya translation, made clear sense to the respondents. For all parties involved in the Chilika case, the distinction between "customary caste-based fishers" and those who are not, is very clear. Since the thesis deals with the issue of marginalisation of fishers, it is probably most logical to understand who is a fisher in the Chilika context, and focus primarily on those fishers. In this context, the centrality of the category of "customary caste-based fishers"

to the study and the resulting findings would not lead to the essentialisation of caste identity. Nonetheless, the study included several interactions with higher caste non-fisher villages in Chilika and the information that was collected has been used in the overall analysis.

Information and experience from the reconnaissance survey and other interactions was used to develop two sets of research instruments: (1) a list of village selection criteria with explanations (**Annexure IV**) and (2) survey formats for a household level survey, for household level livelihood monitoring and for a general survey of all fisher villages in Chilika. There are about 150 fisher villages in Chilika. Ideally, several representative villages should have been picked up for the purpose of household surveys. However, owing to the financial and time limitations associated with a graduate research project, I decided to select two representative fisher villages for an in-depth household survey. A list of village selection criteria was outlined (**Table 2.3**) along with a list of all 150 fisher villages in Chilika. A detailed note on criteria used for selection of study village has been added as **Annexure IV**. I discussed the village selection criteria with several local people with whom I had already interacted and took their suggestions on which villages to pick. Using the village selection criteria, I initially arrived at a shortlist of six villages, visited all of them with the survey questionnaire for field testing, had elaborate discussions with the villages to assess their appropriateness for being selected as a study village, and based on the results I picked two fisher villages for in-depth household survey.

Table 2.3: Criteria used for selection of study village

Selection criteria
• Village inhabited by people who are fishers by caste
• Village where fishing has been the primary or only source of income
• Village which is impacted by the new sea mouth
• Village where lease of fishing area related problem exists
• Village where encroachment of customary fishing areas exists
• Village impacted by shrimp aquaculture
• Village with loss of fishery-based livelihoods
• Village which is facing large-scale out-migration
• Village where fisheries cooperative has broken down and other fisheries institutions are in a flux

The two selected study villages were: 1) Berhampur at the eastern end of the Lagoon near the sea mouth, and represented about 60 fisher villages in the outer channel area (mostly shallow waters) close to the Bay of Bengal and 2) Badakul at the north-south end of the Lagoon that is connected to fresh water rivers (mostly deep waters) and represents about 70 to 80 fisher villages. Thus, both study villages combined gave me a sample that was generally representative of the majority of fisher villages in Chilika - geographical, political, social (caste), infrastructure and connectivity, type of Lagoon ecosystem and fishery resources, type of fishing area, fishing methods and practices, nature of challenges and problems faced. Moreover, Berhampur and Badakul villages broadly represented other Chilika villages in their early and late stages of changes, respectively. For example, while none of the households in Berhampur had a history of out-migration prior to 2001, in Badakul 75% of the households had already used out-migration as a livelihood strategy as early as 1993 (further discussed in Chapter 5, sub-section 5.4.4). Careful selection of study villages was not only useful for collecting representative sets of data but also for making a comparative assessment of the trends and impacts over the years as the two villages followed different trajectories and timelines in

their interactions with Lagoon resources. Selecting the two study villages was an interesting research and learning experience as it involved important decisions, in the context of multiple power dynamics amongst fisher villages, as to why one village should be selected against another and how as a researcher I went about convincing those who were not selected.

2.3.4 Designing the survey formats

Three survey questionnaires were prepared at different stages of the research. First, a household survey questionnaire (**Annexure V**) was prepared based on the outcomes of the reconnaissance survey and it covered areas ranging from demography and livelihoods to out-migration and village institutions. The first draft of the questionnaire contained open-ended questions to maintain a free flow of answers rather than restricting households to pick from a given list of responses. The questionnaire went through rigorous field-testing in the six shortlisted villages and necessary revisions were done before it was implemented in the two selected study villages.

Second, following the household survey, it felt necessary to set up household-level monthly livelihood monitoring to understand how fisher households respond to ongoing crises, the nature of these crises and emerging trends. While the household survey was effective in capturing the status of households at a given point in time and its preceding period, the household monitoring was able to capture the ongoing livelihood and survival processes in fisher households. This was also thought to be an effective tool to gather relevant data for building future scenarios. If household survey clarified what had gone wrong and how, the monitoring exercise showed how things are progressing

over a period of time. With this in mind, a household livelihood monitoring questionnaire was development towards the end of the household survey (**Annexure VI**).

Third, almost a year into the field research I was challenged by a few Fisher Federation leaders about the effectiveness of focusing in only two villages over such a long period of time. The same issue had also come up in some of the meetings of the Federation where a number of villages had raised this issue. Pratap told me that those villages felt neglected being left out of the research and it was turning into a "prestige" issue for some of them. Moreover, there was also growing concern in a few fisher villages that the study, which was by then turning into an important voice for the fishers and many hoped that the outcomes would ring a few bells in the State capital in support of fishers' rights, would not be able to bring forth their specific issues.

In addition, I have had several discussions with my doctoral supervisor and friends and colleagues in NGOs and academia on the possible limitations of focusing only on two of 150 villages. Consequently, even though it seemed like an overtly ambitious exercise, I decided to conduct a general survey in all the 150 fisher villages of Chilika and, as a first step, a survey format was prepared (**Annexure VII**) with the help of fisher friends. An important difference between the household survey and general village survey was that the former was implemented at the household level in the two study villages whereas the latter was used to gather the overall views of each fisher village through village meetings or meetings of the village committee. For the household survey, one survey questionnaire per each sample household was used and only one survey questionnaire was used per each fisher village for the village survey.

2.3.5 Conducting the household and village surveys

Once the household questionnaire was ready, I started household survey work first in Berhampur village, followed by Badakul. In Berhampur, a village with 285 fisher households, 35 percent households were sampled, and in Badakul, a village with 60 fisher households, 100 percent sampling was done. Selection of the study households in Berhampur was done through either random or purposive sampling with an intension to include households with a range of socio-economic and livelihood profiles. Households which had a history of out-migration and those with family members still on migration at the time of the survey were given priority in both the villages. Similarly, households that had already abandoned fishing were purposively included along with those that had higher rates of loans and those who had successfully taken up alternate livelihood activities. On the whole, an attempt was made to maintain a combination of households to represent the diversity of question areas included in the survey questionnaire.

The household survey questionnaires were orally administered by myself and Pratap. It was not focused on the head of the households only, as is done in many other surveys. Rather, an attempt was made to include as many family members as possible, including women and youth, in the process of filling out the survey questionnaires. As a result, only 20 percent of surveys were conducted with men only. About 80 percent of the household surveys, in both villages, were conducted with women members of the family or a mix of men, women and youth members. Out of this 80 percent, 33 percent were conducted with women only. Part of the reason for higher participation of women in the household survey was the absence of male members due to out-migration. Moreover, I

tried to revisit a number household to crosscheck with women members if they were not originally a part of the survey.

No time limit was imposed on completing a household survey and each of them depended on the level of participation a household could offer, both in terms of time and information. Having a survey that included open ended questions provided the flexibility to elicit a variety of answers and get into useful discussions whenever necessary. Thus, in the process of conducting household surveys useful information on several related issues could be gathered. The detailed nature of this survey was a necessity given the complex ecological and livelihood situation in the Chilika Lagoon. On an average each household survey took about 45 to 60 minutes. Of course, a few ended in just 15 to 20 minutes whereas some others took up to 2 hours or a number of revisits over several days.

For the purpose of household livelihood monitoring, 20 households in Berhampur and 10 households in Badakul were purposively selected. All 30 households were picked from the already surveyed households in both the villages. Attention was given to factors such as out-migration, loan transactions, still in fishing or out of fishing as a livelihood source and health issues in selecting households for monitoring. Monthly monitoring was conducted using a questionnaire. Pratap and I jointly conducted the monitoring activity in the initial two months, after which we did it separately as Pratap was trained and also confident to take individual responsibility of monitoring. We trained another person from Badakul village, Nrushingaha, in the household monitoring work and he was able to continue doing it in Badakul starting from the fifth month onwards. Household-level monitoring continued for a period of 18 months spanning January 2008 to June 2009.

Pratap and Nrushingha were able to continue livelihood monitoring work even after I returned to Canada in September 2008.

The scale at which the general village survey was planned required extensive collaboration with the Fisher Federation and other local contact persons. The idea was to reach out to all the fisher villages in Chilika so that a broader picture of the situation of the Lagoon could be drawn. Each village was given one questionnaire to fill out in larger village meetings or in a meeting of the village committee. Several methods were used to complete this survey work: 1) we visited a number of villages, explained what needed to be done, handed over a survey questionnaire along with a return postal envelope, and asked them to send it back when ready; 2) village representatives attending the Fisher Federation meetings were given the responsibility to complete this survey and send it back using the return postal envelope; 3) we were also able to complete a few surveys during our visit to some villages; 4) in certain cases questionnaires were sent through someone from another village and follow up was done over the phone until the survey was returned by post.

There was overwhelming response to the general village survey as we could cover all the 150 fisher villages. Several village representatives called me over phone to discuss about the survey and many of them wanted to see the outcomes appearing in the newspapers or brought to the notice of the government. A number of questionnaires came back not only with answers but also with enthusiastic villagers writing poems that narrated the issues and the problems they were facing. Another set of questionnaires had the signature of all the villagers who participated in filling out the questionnaire and the official seal of the village institution that symbolised the highest level of priority being

given to this work. A few others wrote lengthy letters of support to me along with the questionnaires. I was really moved by the response of my fisher friends, as I realized the level of recognition the general village survey had received. Instantly, I thought to myself that I must make some concrete plans to take the result of this survey to its logical end. This was the start of my plans for a state level policy workshop to present the findings and bring a wider media coverage to the many complex issues the survey had brought to light.

2.4 Specific Research Methods Employed

2.4.1 Mixing a variety of interview techniques

Interviewing is widely known as the most common method of data collection in social science research. Types of interview may range from informal and unstructured to semi-structured and structured. While we often tend to use one type of interview as the dominant method in our research, we often use other types throughout the research period either consciously or unconsciously. Bernard (1988) has discussed four types of interview techniques which he termed as interview control characterized on the basis of the interview situation and the amount of control exercised on the responses of the informant. They include: Informal interview (absence of structure or control), unstructured interview (clear plan and minimal control), semi-structured interview (use of interview guide) and structured interview (response to an identical set of questions). However, irrespective of their types, all interviews involve human interactions thereby subjecting the different processes of interviewing to a similar set of dynamics. Another important aspect is the appropriate use of these interviews, which is dependent on the duration of the research and the specific context within which the research is conducted.

All four types of interviews were used to varying degrees during the research. Mainly, I used a two-prong approach to the use of interview methods. First, I used different types of interview methods appropriately at different stages of my research, e.g., using informal interview in the initial phase of the research and then moving to unstructured interviews in the subsequent phase. Most of the informal and unstructured interviews were conducted during the reconnaissance survey and other preliminary interactions with individuals and institutions. Second, I used semi-structured and structured interviews after the study villages were finalized and I had built a good rapport with the fishers and other people in the area. These two types of interviews were mainly used during the household surveys, interactions with various government departments and local institutions. Since semi-structured interviews and focus group discussions were more extensively used, I discuss both these techniques briefly.

2.4.1.1 Semi-structured interviews

Semi-structured interviews are a central part of all participatory approaches (Pretty and Vodouhe 1997) in which an interview guide is employed (Bernard 1988). The questions asked are content focused and deal with the issues of areas judged by the researcher to be relevant to the research question (Dunn 2000). In this type of interview the role of the researcher is recognized as being more facilitative which provides the scope to redirect the conversation if it has moved too far from the research topic (Dunn 2000).

I used semi-structured interviews to collect data from the fisher community members, NGO and government officials based on a set of pre-determined questions.

This method of interview had a number of advantages over other methods of interview, specifically being useful to conduct interviews within a time bound research project like the one in Chilika. Since an interview guide was used, the risk of accumulating a high volume of gap information could be minimized. The entire interview was conducted in a discussion mode which allowed for refocusing the interview to some of the emerging issues. In other words, semi-structured interview was not necessarily limited to the interview guide. Moreover, the interview guide contained several lead questions that were critical in initiating a dialogue with the participants. In designing and conducting the semi-structured interviews (**Annexure VIII and IX**) I was aware of the fact that if not properly designed and conducted in the field, semi-structured interviews could largely be restricted to the questions in the interview guide thereby leaving many gaps in the information gathered. Moreover, I was always careful not to overemphasize on the interview guide, which would have resulted in the participants losing interest in the entire process.

2.4.1.2 Focus group discussions

Focus group may be defined as an interview style designed for small groups where the researcher strives to learn through discussion about conscious, semiconscious, and unconscious psychological and socio-cultural characteristics and processes among various groups (Basch 1987; Berg 2004). Thus, focus groups allow the researcher flexibility, scope for observation of interactions, collection of substantive content within limited time frame, and access to various sub-groups within the community (Berg 2004).

Planned focus groups were conducted at different stages of the research in order to gain critical inputs from the community. A few focus groups were used to commission the research at the community level and also to present and verify the preliminary research findings. Focus group discussion was a very effective method to research in the fisher communities that are characterized by the legacies of feudalistic structures and differences based on caste and class. In such circumstances, it was not politically pragmatic to talk to the community members as a whole because I was not certain about who would feel comfortable in whose presence and vice versa. Also, in large group settings, the powerless in the community often remain silent or makes censored statements. Women, resource dependent poor, lower caste and the landless often constitute this group. Therefore, focus group discussions were used (**Annexures VIII and IX**) to gather information from different sections and sub-groups in the study communities which primarily consisted of women, fish traders, different factions in the fisher federation, boat and tourist associations, and ice factory association members.

Even though focus group discussions are an effective method of data collection, they are not free from problems. Talking to several smaller groups in a hierarchical community always runs the risk of leading to controversies and confusions. Dominant groups may doubt the intentions of the researcher behind what they may see as "secret talks" with certain groups. Moreover, interacting with women in a typical male-dominated rural Indian community can be challenging. However, my experience in this regard was very positive as I was able to conduct several meetings and discussions with women groups. When special meetings were organised, women came in good numbers and articulated their views clearly. My long term involvement with the community was a

factor for successful women group meetings as I had already interacted with most of them in informal settings, either while visiting their husbands or during the household surveys.

2.4.2 Eliciting peoples' perceptions on marginalisation

My research focused on the question of marginalisation and the best way to go about it was to understand what the fishers think of their own marginalization. The inspiration to do this came from Narayanan *et al.* (2000a). In a study to understand poor people's terminologies and definitions with regards to good and bad life (termed as state of well-being and ill-being), Narayan *et al.* (2000a) used a method of perception listing that was helpful in generating simple meanings of various elements associated with people's lives. The sum total of such meanings generated through interactions with single or/and groups of respondents was useful to understand the key issues or challenges within specific contexts. The application of the method of perception listing within the context of Chilika was helpful to develop an understanding of how the fishers perceived and defined their livelihoods, resource access, entitlements and commons rights and, most importantly, how they visualized their own marginalization. The following steps were taken for perception listing (Narayan *et al.* 2000a):

- Asked a central question.
- Fishers' own terminology and definitions emerged.
- Prepared clusters of themes based on fishers' responses.
- Recorded the diversity of answers by context and person.

- List of perceptions emerged.

Perception listing made it possible to capture the material, social, physical, psychological and political dimensions pertaining to the central questions on change, disconnect and marginalisation which was useful to comprehend a full picture of the issues or problems. Such a method of working with poor people was relevant to both the research context as well as the research topic. In understanding what a good experience of life is, there is perhaps no end, no final answer. However, if development is to enhance the well-being of poor people on their own terms, there is much to reflect on what they have to say (Narayan *et al.* 2000a).

2.4.3 Scenario building

Effectively steering a process of social change by dealing with complex issues and problems entails foreseeing the consequences of human action. In this context, scenario building as a research method allows the use of ethnographic data for thinking about possible, alternate futures. Scenarios can help to more systematically evaluate the possible outcomes of socio-cultural change. However, scenarios are not oriented towards prediction; rather they are based on assessment of past events, taking stock of the present and discussion of the future so that certain undesirable actions and consequences linked to them can be avoided (Heemskerk 2003). Since the future is complex, dynamic, uncertain, and unpredictable (Wollenberg *et al.* 2000; Peterson 2006), scenarios explore a diverse set of alternate futures rather than a narrow range of likely futures (Heemskerk 2003).

A scenario building method was particularly used to analyze linkages between past, present and future events linked to fishers' livelihoods in Chilika and the following steps, as outlined by Peterson *et al.* (2003), were used to build possible alternate future livelihood scenarios and a predictable sequence of possible transformations in fishers' livelihoods (Chapter 5):

- Bounding livelihood problems.
- Synthesizing existing information and data from primary field research.
- Identifying alternate paths or uncertainties that could shape the future.
- Creating a set of scenarios that capture a set of important alternatives.

In a diverse social, economic and cultural setting like Chilika there were differences among fishers on what they view as a desirable future in terms of their livelihoods. However, it was possible to get a consensus view through several deliberations and sharing meetings among fishers in different types of settings. Experiences from studies elsewhere have shown that scenario building has provided a mechanism for a diverse group of people to discuss and imagine the future of a region. Nevertheless, this takes time (Peterson 2006) and in the case of Chilika I was only able to get close after 28 months of field research.

2.4.4 Stakeholder analysis

Borrini-Feyerabend (1997) defines stakeholders as social actors who have a direct, significant and specific stake in a given territory or set of natural resources. A

number of factors including geographical proximity, historical association, livelihood dependence, institutional mandate, economic interest or a variety of other concerns may create stakes for these actors. The important aspects followed in identifying stakeholders in Chilika included:

1. Stakeholders are usually aware of their own interests in the management of the territory or set of resources;
2. Stakeholders usually possess specific capacities (e.g., knowledge, skills) and/or comparative advantages (e.g., proximity, mandate) for such management; and
3. Stakeholders are usually willing to invest specific resources (e.g., time, money, political authority) for such management.

In Chilika, different stakeholders have different interests, and these are in conflict. Different groups have different ways of perceiving problems and opportunities about the Lagoon and its resources, and different priorities for development of the Lagoon. Identifying stakeholders was one of the initial activities of my research in Chilika. The following checklist (ODA 1995) was used for identifying stakeholders:

1. Have all primary and secondary stakeholders been listed?
2. Have all potential supporters and opponents of the project been identified?
3. Has gender analysis been used to identify different types of female stakeholders (at both primary and secondary levels)?
4. Have primary stakeholders been divided into user/occupational groups, or income groups?

5. Have the interests of vulnerable groups (especially the poor) been identified?
6. Are there any new primary or secondary stakeholders that are likely to emerge?

2.4.5 Participation in community life

Social research often necessitates the researcher spending a relatively long period of time within the community. It allows the researcher to derive insight from a community's values, dynamics, internal relationships, structures, and conflicts as opposed to their stated opinion of what exists (Rennie and Singh 1996). Bernard (1988) observed that many researchers have found that long-term involvement in communities can yield an understanding of social change that is simply not possible any other way. Participation in community life was an integral part of my research, given the emphasis of the research on understanding small-scale fisher perspectives. This helped gain insight as to how the fisher communities were organized and how they operated, as well as the level of interaction they had within themselves and with the outside world.

While a series of interviews and discussions clarified the perceptions and practices of the fisher communities, my close involvement provided firsthand experience on how and why they perceived certain things in certain ways. It offered critical clues about the cultural and social orientation of the community, which often influenced the perceptions and practices of people. In other words, it gave me an intuitive understanding of what's going on in a culture, allowed me to speak with confidence about the meaning of data and make logical statements about cultural facts, and extend the internal and external validity of information collected by interviewing (Bernard 1988). My involvement in community life took the form of spending quality time in the study

villages over a long period and participation in several social and cultural ceremonies and festivals, including fishing activities, local rallies and movements by fishers, marriages and death.

2.4.6 Working with the Chilika fisher federation

At the beginning of the field research, the fisher federation had already been divided into six factions. (Details on the fisher federation, emergence of its six factions and their power relations are discussed in Chapter 6 on institutions.) However, in May 2007, there was some initial interest shown by a few of the factions to start a process of coming together and building issue based collaborations amongst them. I became a part of this process and attended nine of those federation meetings during July 2007 - August 2008 (**Table 2.4**). I offered my help to the federation by documenting the proceedings of the meetings and sometimes supporting them logistically. Sometimes I helped them to draft letters to government officials and also translated some of the new policy guidelines from English to local Oriya language. These meetings turned out to be an important source of information for me as members discussed various issues in detail, looking both at historical events and points of interest and future. Several contentious issues were debated, negotiations made and agreements reached during these meetings and all of that was an enriching experience for me.

Table 2.4: Important meetings of Fisher Federation during 2007 - 2008

Federation meetings attended	Date of meeting
1. Gajapatinagar, Ganjam district	29th July 2007
2. Alupatana, Puri district	12th August 2007
3. Nairi, Khurda district	26th August 2007
4. Pathara, Khurda district	21st December 2007
5. Kalijai, Khurda district	11th January 2008
6. Patanashi, Puri district	17th February 2008
7. Kespur, Ganjam district	29th February 2008
8. Pathara, Khurda district	23rd March 2008
9. Gajapatinagar, Ganjam district	15th August 2008

2.4.7 Issue specific workshops

The need to organize specific workshops came up during a number of village meetings. Village leaders suggested that larger discussions, involving selected resource persons from the Chilika area, on important topics should be organized in order to get a broader perspective on the issues emerging from village level interactions. A number of workshops were organized that focused on the nature of fishers' rights, responsibilities and power, developing livelihoods strategies, developing a framework and principles for fisher friendly policy in Chilika, as well as discussion on multiple social, economic and ecological issues of the Chilika fishers.

2.4.8 Policy analysis and secondary information

A detailed research to analyze relevant state policies and laws concerning the management and conservation of the Lagoon was undertaken. This policy analysis tried to capture the overall policy environment within which conservation and management of wetland commons take place. It provided an understanding of the processes and strategies through which community-level resource management arrangements in Chilika were impacted and influenced by external factors, including State laws and regulations. It brought out various historical and current trends in the management of Chilika fisheries. Policy analysis involved the collection of secondary information from a variety of sources both at the state and local levels. At the State level it included Odisha Legislative Assembly proceedings, FISHFED documents, CDA documents, Fisheries department, Revenue department, Environment and Forest department, Wildlife department, State Archive, State library, University, Research institutions, NGOs. Local level documents included village records, fish traders' books, fisher federation files, boat association

records, other historical documents and maps from certain key individuals. In addition, focused interviews and discussions with policy makers, administrators, environmental NGOs, researchers, academia and community representatives were undertaken to gather their views and recommendations on policy directions pertaining to Chilika.

2.5 Techniques for data recording and analysis

Data recording was an important activity in order to store field data for analysis and interpretation. Field data was collected using field notes and observations, audio recording and transcribing, video documentation, digital photos, household diaries for livelihood monitoring, workshop summaries and reports. Household survey data were entered into Microsoft Excel sheets for generating analysed tables and graphs.

2.6 Dealing with field situations as they came up

Box 2.1 gives an example of my response and follow-up to one emerging situation in the field. It provides an insight into working with the poor and challenges that require, among other skills, a degree of empathy to assess the situation and make necessary responses.

2.7 Preparing to leave the field

I left Chilika in September 2008. Finishing up my long association with Chilika fishers was not an easy task, both at emotional and professional levels. A few months before leaving Chilika, I started to tell my fisher friends that my time was coming to an end. There were so many of them whom I would like to meet individually and give my “thanks” and say a proper “good bye.”

Box 2.1: Excerpts from my field notes in Berhampur village

Visits to Bikram Jena and family

19th August 2007

Bikram's family was the most desperate household I met during the survey. They have five children (one son and four daughters), the eldest being about 10 years old. Having no food in the household is a routine phenomenon. Bikram spends majority of whatever little he earns on alcohol. They do not have proper housing to live with five kids. Today, when we visited them we found that the household had nothing to eat and the kids were hungry. Pratap and myself decided to give them our lunch box (*roti* -flat bread- and vegetables curry). After meeting this family we decided not to carry our lunch to the village anymore: How can we eat in a village where at least a couple of households do not light their *chullahas* (wooden stove) on any given day. We have made it a point to visit this family frequently and we will try to convince Bikram to stop drinking. He is now planning to go on *dadan* (out-migration). I am planning to do something for the kids so that they can at least continue going to school. We also found that mid-day meal is the prime reason why they do not miss the school - study for food - and if there is a long holiday they go hungry very often.

We also learnt that community members are tired of helping each other due to the desperate situation. Everyone in the village is affected by the livelihood crisis thereby most of them are out of their capacity to help others. Bikram's family got support from other household when he lost his fishing occupation but support comes seldom these days. Bikram's household is a perfect example of how people are further marginalized with the breakdown of joint family system in the village, a phenomenon which has almost become a rule as the livelihood crisis intensifies.

9th October 2007

We visited Bikram's family this morning after about one and half months. The delay in visiting them was due to the rains which flooded the road to their house. His wife told us that Bikram had already left on *dadan* (out-migration) for Kerala last month. He had called up on the 7th October to say that he had not got any jobs there and was actually looking for one. He asked his wife if she could manage without money for another two weeks after which he will send her some money. Of course, sending money will depend on whether he is able to find work. Alternately, he would be forced to return home if he is not hired. His wife had advised him to stay back and try to get work there. If he returns home then there is no work in the village and there is not even any fishing gears or boat to try fishing. They sold the fishing gears and the boat to survive during the crisis and also to repay the moneylender. Moreover, the moneylenders have already warned them to return the remaining debt. Bikram wanted to come back for the festival (*kartika purnami*) to be with his family but she advised not to because that would be expensive and could mean borrowing money with higher amounts of interest. She does not have cash or food at home and with five small children she cannot even go for collecting firewood. She is living in a very desperate situation - cooking one day and nothing to cook for several days. She had a contact phone number for Bikram at Kerala and I immediately tried to contact Bikram on that number from my cell phone. But we could not reach him. We will try again tomorrow.

I feel I must do something for this family at least till Bikram finds work and sends some money to them. They cannot be left to rot like this. After all, it is the question of five kids who cannot be neglected at this tender age. But the confusion is that if I do something for this family then others will start feeling bad and this may turn into a big village issue. I perhaps cannot support everyone...but I have to find a way out.

I also planned a number of activities in order to complete the research process with some logical "finishing touches." I met with most of the fisher village representative at the last federation meeting in August 2008 before my departure from Chilika. The policy meeting at Bhubaneswar in September 2008 was another occasion where I met not only fisher village leaders but many others with whom I had interacted during the course of the study. In the two study villages, I fixed up dates for village level final research meetings with an intention to present the preliminary outcomes. These meetings were also an opportunity to formally end the research activities in these two villages and thank all villagers for their support. I also set up separate dates for each of these two villages for photo sessions. The deal was that I would be available to take photos of the fisher families, those who were willing to have their photos taken, and print them free copies. I brought the village children notebooks and pencils as a token of appreciation for all the time I had spent with them, learning and reflecting on my work inspired by their wisdom and curiosity. They were my greatest friends and perhaps the best hope for a better Chilika in future.

Children of Badakul village posing for a group picture
Photo: Pratap Das

Fishing is a lifelong “movement”
The banner reads: Rally for fishers’ rights to life and livelihood
Photo: Prateep Nayak

CHAPTER 3

FISHING FOR POWER:

INFLUENCE OF HISTORY AND POLITICS[15]

3.1 Introduction

Chapter three provides a short account of the historical and political background to the processes of change in Chilika Lagoon fisheries, and its implications for fishers' marginalisation. It explores how social-ecological change in Chilika has been influenced and shaped by its history and the political processes surrounding it. It follows a chronological description of various developments with regard to caste and class structures, emergence of ownership rights and State control, changes in policy and institutional arrangements, dominance of conservation and development narratives, and records the responses of fishers to these factors which often took the shape of "people's movements". The thesis mainly looks at a somewhat recent history that spans the last seven decades, even though it presents selected material on property rights development from the 16th century onwards. .

The chapter starts with a paradox - the gap between the official account and the local fishers' view of the changes in Chilika Lagoon. First, I explore fishers' views through metaphors they use to express their marginalisation. Second, I analyse four political-ecological narratives to provide a conceptual base for the fishers' metaphors. Third, I further explain the paradox of marginalization by substantiating both the fishers'

[15] Parts of this chapter, plus content from some of the later chapters, have been published as: Nayak, P. K. and F. Berkes. 2010. Whose marginalisation? Politics around environmental injustices in India's Chilika Lagoon *Local Environment* 15 (6): 553–567.

metaphors and the four conceptual narratives through a detailed discussion on the history and politics in Chilika. Finally, I analyse marginalisation as a process by thematically linking the fishers' metaphors with the narratives.

3.2 The Paradox of Marginalization

According to the Odisha State Government, the production and income from Chilika paint a very rosy picture of development: 10-fold increase by weight in prawn production, five-fold increase in fish production, 16-fold increase in crab production, and some 16-fold increase in annual average household incomes from Rs 3470 in 1996–1997 to Rs 52,963 in 2002–2003 (Singh *et al.* 2006). The income figures alone suggest that the income levels of Chilika fisher families are a staggering 160 percent higher than the national average income set for defining Below Poverty Line (BPL) families in rural areas of India (as per 9th Five Year Plan, Planning Commission of India). These figures also range between 25 to 40 percent higher than the international poverty line of a-dollar-a-day, by 2002 standards, as defined by the World Bank. In fact, such figures indicate significant levels of achievement in social and economic development for local people thorough natural resources management appropriate for the use of Chilika as a sample case for governments and societies world over.

Here in lies a strange paradox. According to the fishers themselves, both the yields of the important fish species and their incomes have declined over this period. The decline has been serious enough to make fishing livelihoods no longer viable in some villages, with negative trends in all fishing villages (Nayak and Berkes 2010). The fishers

articulated this paradox through four metaphors that explain the current level of social-ecological changes in the Lagoon and the resulting implications for their marginalization.

Metaphor 1: "Chilika was our *bhata handi* [rice pot], and our local bank [fish as cash]" is used by the fishers to symbolise the social-cultural and economic importance of the Lagoon and their fishing activities. In a dominant culture of rice and fish, a pot of rice symbolises constant availability of food, as one would never find a rice pot empty in the households of Odisha villages. The notion of "fish as cash in the bank" is used to explain the importance of fish in the local economy, where fishers could easily manage without cash and with plenty of fish in the Lagoon (as their bank).

Metaphor 2: "What do we do when the *Brahmins* and the *Karans* like fishing" is used by fishers to describe a situation where everyone, irrespective of caste and economic status, began to love fishing in Chilika and how, in the process, the real fishers get sidelined or eliminated. It draws particular attention to the growing involvement, mainly through investment, of higher caste and powerful elites from political and bureaucratic circles in shrimp aquaculture activities within the Lagoon. The result has been a true silencing of an entire community of customary fishers pushing them into a state of gross powerlessness. The involvement of higher castes and other elite classes in the Lagoon resource use and fishery highlights their attempts to expand their financial capital through making large scale profits. This symbolises the new capitalist forces that are already at work in the context of Chilika. Fishers believe that such acts have caused a sort of political death for themselves and their organisations.

Metaphor 3: "Mother Chilika is crying" is used by fishers as an allegory to explain the current state of ecological health of the Lagoon. The far-reaching ecological degradation observed in recent years has caused enough disgrace to mother Chilika ("*Maa* Chilika" as fishers commonly call it) to cry. Some fishers also add that mother Chilika is crying because her children (the fishers) are currently undergoing an unprecedented amount of suffering.

Metaphor 4: "*Gariba ra peta bhoka mundaku chadhile andolana hin eka matra pantha* [For the poor, when hunger becomes unbearable, movement becomes our last resort]" is used to suggest that social and political struggles and movements are the ultimate options for the fishers when social, economic, political and environmental problems have become rampant. Fishers realize that when everything seems to be going against them and nothing really works in their favour, coming together to protest the acts of the oppressors becomes an obligation.

From the local fishers' perspective, the four metaphors symbolise a broader picture of changes in the Lagoon social-ecological system and, more importantly, their own marginalisation. Metaphor one is about the social and economic significance of the Lagoon in determining their level of marginalisation where not having "food in the pot" and a lack of "cash in the bank" (or fish in the Lagoon) indicates marginalisation in terms of food insecurity and economic deprivation. Metaphor two draws attention to the growing power imbalances, political, class and caste dynamics and alterations in resource access and institutional regimes as factors in their marginalisation. It also emphasises the dominant role of capital which motivates the higher castes and powerful elites to engage in aquaculture. Metaphor three focuses on the ecological status of the resource as an

important determinant of marginalisation where loss of ecosystem health may cause social, economic, and political deprivation. Metaphor four clarifies that the inner strength of the poor rests with their capacity to resist deprivation and oppression through political struggles and movements. These are ultimate actions, often with significant levels of success. A combination of all four metaphors offers an overall picture of changes in the Chilika social-ecological system from the fishers' point of view and the extent of marginalization being faced by them.

There appears to be a gross mismatch between the government claim of increased incomes and fishers' experience of Lagoon degradation. However, per capita income calculations are based on aggregations that tend to falsify the real picture of income distribution. The paradox of the official account of "development" and the fishers' views about their own marginalization indicates a conundrum that requires further scrutiny. It cannot be treated only as a question of the gap between the official vs. the local view of marginalization. Rather, it indicates a much deeper meaning and complex trends associated with the processes of change in Chilika and the social-ecological marginalization of its fishers. How does one conceptually deal with this? The following section deals with the important question of conceptually explaining this paradox of marginalization through the development of an analytical framework. Following this, the rest of the chapter aims to further investigate the paradox with specific reference to the historical and political context and processes of change in Chilika fisheries.

3.3 Conceptualizing the Paradox: A Framework

The four metaphors deal with a range of issues that link environmental change and fishers' marginalization in Chilika through a set of prevailing economic (metaphor 1), political (Metaphor 2) and ecological (metaphor 3) indicators. Metaphor 4 points to possible responses to these changes and the resulting impacts. These issues are diverse and can be seen as operating at multiple levels which makes the understanding of change a complex process. Conceptualizing the fishers' metaphors requires an overarching approach that can link socio-political influences with ecological dynamics.

Linking political and ecological strands of environmental change discourses in Chilika may help to analyze issues across a range of levels, from very micro to macro, by focusing on the influence that society, state, corporate, and transnational powers have on creating or intensifying environmental problems and influencing environmental change. It seeks to expose flaws in dominant approaches to the environment favoured by state, corporate and international authorities, and favours a reevaluation of impacts and conditions, especially from the perspective of local people, marginal groups, and vulnerable populations (Robbins 2004). Thus, a political ecology approach becomes appropriate for analyzing the fishers' metaphors as it takes various social and environmental conditions as contingent outcomes of power at different levels and tries to deconstruct and demystify dominant discourses and policies by giving preference to the value of "traditional", "historical" and "local" ways of understanding and dealing with ecological processes. In addition, it is also concerned with alternative strategies for development, and techniques of local adaptation and resistance (Peet and Watts 1996; Rosin 1993). To put this in perspective, a political ecology approach, in the context of

Chilika, seeks not simply to be retrospective or reactive, but to be progressive (Robbins 2004).

Table 3.1 presents four political ecology narratives (Robbins 2004) that are used to further conceptualize the metaphors in the analysis of this chapter. First, the *degradation and marginalization* narrative postulates that the otherwise environmentally innocuous local production systems undergo transition to overexploitation of natural resources on which they depend as a response to state development intervention and/or increasing integration in regional and global markets. This may lead to increasing poverty, and cyclically, increased overexploitation and, consequently, a vicious circle of marginalization. This narrative emphasizes that in resource dependent communities marginalisation appears with degradation, and once established, triggers further degradation. This obviously takes the shape of a vicious cycle.

Table 3.1: Four narratives and the things they attempt to explain

Narratives	**What is explained?**	**Relevance**
Degradation and marginalization	Environmental change: Who and how?	Lagoon degradation, long blamed on the fishers, is put in its larger political and economic context
Environmental conflict	Environmental access: Who and why?	Environmental conflicts are shown to be part of larger gendered, classed, raced and caste struggles and vice versa
Conservation and control	Conservation failure and political/economic exclusion: Why and how?	Usually viewed as benign, efforts at environmental conservation are shown to have pernicious effects, and sometimes fail as a result
Environmental identity and social movement	Social upheaval: Who, where, and how?	Political and social struggles are shown to be linked to basic issues of livelihood and environmental protection

Source: Framework adapted from Robbins (2004:14)

Second, the narrative of *environmental conflict* concerns itself with the acceleration of conflict between groups (gender, class, caste or ethnicity) due to

increasing scarcities produced through resource enclosure or appropriation by state authorities, private firms, or social elites. Environmental problems become "socialized" when local groups secure control of collective resources at the expense of others by leveraging management interventions by development authorities, state agents, or private firms. Existing and long-term conflicts within and between communities, and between the state and communities are "ecologized" by changes in conservation or resource development policy. This narrative suggests three fundamental lessons: (1) social systems are structures around divisions of labour and power that differentially distribute access and roles for natural goods and systems; (2) property systems are complex bundles of rights that are politically partial and historically contingent; (3) historical experience of development activities is rooted in specific assumptions about class, caste, race and gender in the development process, often resulting in poorly formed policies and uneven results.

Third, according to the *conservation and control* narrative control of resources and landscapes has been wrested from local groups through the implementation of efforts to preserve "sustainability," "community", or "nature". In the process, several external drivers including state officials and global interests have disabled local systems of livelihood, production, and socio-political organization. Related work in this area has further demonstrated that where local production practices have historically been productive and relatively benign, they have been characterized as unsustainable by state authorities or other players in the struggle to control resources. This narrative is guided by four fundamental foundations: (1) conservation reflects a form of hegemonic governmentality (Foucault 1991; Bryant 2002); (2) traditional resource management

strategies as institutional systems that does not necessarily involve state intervention and individualized property rights; (3) wilderness is a social construct and it takes the form of nature without people; and, (4) an understanding of conservation territories as ecologically and socially problematic, and inadequate to meet the goals of preservation either of nature or livelihoods.

Fourth, the *environmental identity and social movement* narrative suggests that the changes in environmental management and environmental conditions have created opportunities or imperatives for local groups to secure and represent themselves politically. Such movements often represent a new form of political action, since their ecological strands connect disparate groups, across class, caste, ethnicity, and gender. In this way, local social/environmental conditions and interactions have delimited, modified, and blunted otherwise apparently powerful global political and economic forces. This narrative suggests that the factors that lead to marginalisation have the potential to lead to collective awareness and collective action by different groups who are under the same set of impacts. It also reflects the concern of environmental justice discourse whereby communities take the brunt of the uneven distribution of impacts from environmental change and initiate resistance to assert their identities as environmental subjects (Agrawal 2005).

In the following section, I explain further the paradox of marginalization by substantiating both the fishers' metaphors and the four narratives through a detailed discussion on the history and politics around social-ecological change in Chilika Lagoon.

3.4 The Micro Context: Chilika Lagoon and People Dynamics

3.4.1 Caste politics and dynamics

Caste in India is defined according to the four *vernas* as per the vedas (Hindu Scripture). The four *vernas* consist: 1) Brahmins (scholars and priests); 2) Kshatriya (warriors, rulers, and landlords); 3) Vaisya (merchants); and, 4) Sudra (service providers and laborer). In the conventional Hindu society, the caste hierarchies are rigid with the Brahmins occupying the highest position followed by the other three *vernas*. There are numerous sub-castes within each *verna*, often with particular geographical and occupational specificities that generate many dynamics amongst these caste groups (Singh 2009). Consistent with India's caste traditions, the fisheries in Chilika have been largely influenced by prevalent caste dynamics. The fishers are caste-based, meaning that the fishery consists of traditional fisher groups whose vocation is identified by their membership in certain Hindu castes.

Table 3.2 details the profile of the fisher castes in Chilika. There are several fisher castes in Chilika and a number of sub-castes mostly belonging to the *Kaibartya* caste. There are also two other groups of fishers known as *Nolia* which is not a local fisher caste. They include fishers who are originally from Andhra Pradesh State. The other group is known as "refugees" who were originally from Bangladesh but settled here after the 1971 war. These two groups are not part of the traditional caste system in Chilika therefore they are not seen as members of any specific caste-based fisher groups.

Table 3.2: Profile of caste groups in Chilika

Caste groups	Profile
1. *Keuta* or *Kaibartya*	They are the largest group of fishers in Chilika (about 50 % according to Mitra and Mohapatra 1957). They are at the top in the caste hierarchy of fishers. They are educated than other fisher castes. They reside in villages on all the four sides of Chilika.
1.a *Dewar kaibartya*	Live in villages on the east and west side of the Lagoon. They used to row commuter boats earlier and gradually took up fishing as their main occupation. They value education and in some villages it is compulsory up to grade seven.
1.b *Hula Hania Keuta*	They live in villages on the west side of the Lagoon. They use different types of gear that are designed for specific fish species (*patua*, *bekti*, *khainga* and drag nets). They fish mostly during the night with search lights and fire balls.
1.c *Bilua Keuta*	They use a variety of nets and mostly fish in groups. They make sounds like a fox (*Bilua*) to divert the fish towards the nets.
1.d *Chudutia* or *Chudakuta Keuta*	Their customary occupation is to prepare pressed rice and also supply it the world famous Jagannath temple at Puri. They were primarily engaged in small grocery businesses and some farming. In recent times they have been fully engaged in fishing and fish related activities.
1.e *Kaibartya*	Customarily engaged in making all types of boats for Chilika fishers. However, they are also engaged in fishing and fish related activities.
2. *Niari* or *Liyari*	Customarily engaged in making puffed rice (*liya and ukhuda*) and selling it in the fish landing sites and local fish markets. They use *patua* nets and mainly catch *patua* fish. They are very few in numbers and live in Tangi, Balugaon and Bhusandhapur (places know as important fish markets around Chilika).
3. *Karetia*	Mainly reside in Mangalajodi and Kumandala villages on the west side of Chilika. However, their fishing areas are mainly on the east side of the Lagoon where they fish most of the year using handmade cotton nets. In recent times they have transitioned to nylon / synthetic nets.
4. *Gokha*	Primarily live in Gorapur and Nuapada villages on east side of Chilika. They are very few in number. Customarily they used *khadi-jala* (nets) and *khepa-jala* (nets) with a gradual shift to nylon / synthetic nets.
5. *Khatia* or *Katia*	Located on the east and west side of Chilika in several bigger villages. Most of them are not included in the scheduled caste category. Primarily use drag nets and also other kinds of local nets. They are economically better off. Their cast panchayat includes nine Khatia caste villages (known as *Naa-desha* or nine nations) and their marriages are limited to these nine villages only.
6. *Kandara*	This is the second largest fisher caste group after Keuta or Kaibartya. They live all around the Lagoon either in separate villages or as a unit of a larger village. They primarily use different types of traps for fishing (*thata, baza, dhaudi* which are made of bamboo). They mainly fish different types of prawns.
7. *Tiara*	Live on the east and west side of the Lagoon. They use traps for fishing like the Kandara caste fishers.
8. *Nolia*: *Jalia* and *Khalashi*	Live on the east side of the Lagoon near the sea mouth and channels that are close to the Bay of Bengal. They are immigrants from south India (Visakhapatnam, Bhamunipatana and Kalingapatana in Andhra Pradesh) and speak the Telugu language or mix of Telugu and Oriya. They are very courageous; they fish in both the Lagoon and the sea. They are further divided into *Jalia* and *Khalashi* – the former group fishes in both the Lagoon and the sea, and the latter fishes mainly in the Lagoon. They do have marriage relationships between them. They use lager nets that are suitable for both the Lagoon and the sea.
9. Refugee	Refugees from Bangladesh who live in Balugaon and Bhusandhapur areas of Chilika. They began to settle around Chilika in 1985 and took up fishing as an occupation even without any formal rights in the Lagoon. They are often in conflict with the customary fishers of Chilika.

Source: Nayak field notes, checked against Das (2002)

The *Nolias* are sea going fishers who have lived near the sea mouth of the Lagoon for a few generations now. They also fish in the Lagoon waters with their own leased fishing area. The "refugees" are of recent origin but they mostly depend on the fishery resources of the Lagoon for their livelihoods. Similar to the status of *Nolias,* the "refugees" are not part of the caste system in Chilika, but both are included in **Table 3.2** because they are involved in the ongoing contestations regarding Lagoon resources, and they are identified as "fishers" (details discussed in Chapter 4).

Even though the caste-based fishers are seemingly homogeneous, there are in fact differences and diversities amongst them. There exist a caste hierarchy between the fisher and non-fisher castes, whereby the non-fishers are considered higher and fishers as lower castes. A similar hierarchy also exist within the fisher castes, reflecting equity concerns inherent in fisher caste structures. The dynamics associated with this are elaborated in section 3.5 later in this chapter and in Chapter 4 on commons (section 4.3.2 and Table 4.2 on caste-defined fishing norms and rules).

It is important to note that fisher castes are generally placed on the lower rungs of the caste system. In the past, the occupation of fishing exclusively belonged to these fisher castes and fishing or fishing-related activities by other higher castes were looked down upon, often resulting in ostracism from caste society for those physically or otherwise engaged in fishing. However, these caste taboos on fishing have weakened in modern days, more importantly with the advent of shrimp aquaculture in Chilika Lagoon. One now even finds *Brahmins* (who are at the top of the caste hierarchy) engaged in shrimp aquaculture and many other higher caste groups as well. A majority of the fish traders at Balugaon, the central landing site and fish market of Chilika, are non-fishers by

caste who control the entire trade of the Lagoon fishery. This has resulted in serious conflicts between caste-based fishers and non-fishers leading to court cases and also open fights over the last three decades.

In a situation of growing caste conflicts in Chilika, shrimp aquaculture and its related encroachment on customary fishing areas has emerged as the single most important factor that shapes the nature of politics around Lagoon resources and decision-making (details discussed later in this chapter and in Chapter 4 on Commons). The non-fishers are equipped with money, muscle and political power to take over the Lagoon through aquaculture development, and are gradually displacing the original fishers from their customary fishing areas and fishing based livelihoods. The fishers continue to struggle against these unhealthy trends but often find it difficult to challenge the power of the non-fisher higher castes and their elite supporters (details on shrimp aquaculture and its related issues have been discussed later in this chapter and also in Chapter 4 on commons). Thus, the conflicts between fishers and non-fishers are now at a boiling point.

Political and bureaucratic representation of fishers is an important aspect of caste and class politics in Chilika context. Caste politics involves successive electoral victories of *Khandayat* and other higher caste politicians in the Chilika area. The area in question consists of nineteen gram panchayat (*Sarpanch*), seven State Legislative Assembly members (MLA) and three members of National Parliament (MP) constituencies. It shows that the non-fishers have been at the helm of decision-making with regard to Chilika because of their continuous success in elections and the fishers have been grossly underrepresented in the political system of the country. Similar trends have been reported by Mohanty (1991) whereby Khandayats as a caste group enjoy majority status in the

State, large landholdings, higher education status, and growing political power. Thus, they are in a position to command political dominance in Odisha. Non-fishers in Chilika are higher castes which includes Khandayats. Many fisher leaders cited dominance by Khandayats and other higher castes as a critical factor in their growing powerlessness and marginalisation.

Some fishers argued in favour of creating separate constituencies in Chilika at all of these three levels of political organisation that would be exclusively reserved for caste-based fishers. This would give an opportunity for the fishers to elect their own political representatives who could voice their concerns and protect their rights in different realms of policy making. Such proposals for caste-based political representation in Chilika came from the fishers themselves during interviews, and a recommendation to that effect had already emerged from consultations organised by Samal (2007)[16]. Caste-based political representation is not a new concept, and the Indian constitution mandates it (Pande 2003). Seats are reserved for historically disadvantaged groups (Scheduled Castes and Scheduled Tribes) in national and state legislative assemblies, and for historically disadvantaged groups and for women at all levels of the Panchayat system (Duflo 2005). Therefore, the suggestion by the fishers for caste-based political representation in Chilika is not totally unprecedented, however, the literature on the problems and prospects of caste-based political representation in India is immense, and this thesis does not attempt to deal with this subject.

[16] Related recommendations had also emerged during a series of consultations conducted by Samal and his research team under a project "Development of a knowledge-based for coastal aquaculture policy making, planning and management" under a project of the Shastri Applied Research Project, Shastri Indo-Canadian Institute.

The argument of political representation based on caste criteria can therefore be contested. However, in places like Chilika where the situation has not improved for the fishers in the last six decades after independence, under a political regime dominated by higher caste politicians, the argument that it is high time for the fishers to take political representation into their hands is not totally unfounded. The fishers argue that only when fisher leaders formally represent the community in the political system of the country, will their concerns be addressed on a more permanent basis. The non-fishers argue that such a move would be disastrous, as the fishers are incapable and unworthy of such high level representation. In interviews, some of them also expressed confidence that the fishers will never be able to reach that level because of their sheer lack of numbers, which matter most in a representative democracy. However, fisher leaders argue that exclusive representation of fishers is possible if all or selected political constituencies in Chilika are reserved for fisher castes only.

3.4.2 Emergence of access, property rights and state control

3.4.2.1 Pre-independence Chilika

"The story about the origin of our (property) rights in Chilika is partly lost in unknown history. No one knows when it all might have started. It is perhaps as old as the Lagoon itself or when our great forefathers first lived here," explained Nitiyananda Behera, a nonagenarian of Badakula village. No matter when they might have originated, the caste norms and rules are considered the first basis to understand the emerging property rights situation in Chilika. These rules also made fishers' access rules discernable, bringing clarity to who could fish where, when, what species and size of fish, and how much. Of course, the rules had varying degrees of state recognition, both in the

pre- and post-independence period. Even though part of the history on the development of property rights in Chilika is untraceable, documented but unpublished local histories offer recorded evidence that formalization of fishers' access and use rights took place as far back as the late 1500's. The Mughals conquered Bengal and Odisha in 1576 and ruled until 1751 when Odisha was ceded to the Maratha rulers (Ray 1960, 1981). Evidence suggests that during both the Mughal and Maratha rule, the fishers had access to the Lagoon fisheries which were regulated through *Jagirdars* (in charge of *Jagir Mahals*), *Zamindars* and *Mustadars* appointed by the kings (**Annexure X**). Thus, such an arrangement became the first ever documented evidence of state control of the Lagoon.

Oral history collected in Berhampur village confirmed that the king of Parikuda bought parts of the Lagoon from Fathe Mohammad, a *Mustadar* and took control of the entire Lagoon afterwards as the Maratha rule started to weaken. During this period, the fishers were able to exercise their fishing rights over the *sairats* (fishing grounds) by paying *bheti* or *salami* (tributes or gifts in kind) to the king and the *Zamindars* in order to obtain permission or a license. This started in 1790 and continued until the colonial government took over the fishing activities in Chilika in 1930. It is interesting to note that even though Odisha came under British rule in 1803, the ownership of the Lagoon remained with the King of Parikuda until about the beginning of the 1900's whereas a British company controlled revenue administration in Chilika (Pattnaik and Mehrotra 2006).

During the colonial rule, the then British Surveyor J. H. Taylor recorded in 1880 complete fishing rights over the Lagoon in favour of the fishers. The following British settlement for Odisha in 1897-98 also recorded exclusive enjoyment of fisheries in

Chilika by the caste-based fishers.[17] However, the ownership of the Lagoon remained with the Kings of Parikuda, Khallikote and Palur who administered the fisheries of Chilika through the Z*amindars* of Khallikote, Parikuda, Suna Bibi, Mirza Taher Baig and the Chaudhary families of Bhungarpur and the Khas mahal areas of Khurda. The *zamindars* used to lease out the fisheries exclusively to the caste-based fishers for customary fishing activities and collected lease rents for the fishing *sairats*. With this started a more formal lease system for apportioning fishing rights in Chilika that continues even today. The British also started a cooperative store in Balugaon in 1926 to sell fishing equipments to local fishers. They also constituted 25 Primary Fishermen's Cooperative Societies (PFCS) during the Second World War.

3.4.2.2 Post-independence developments

Starting during the Mughal era, the *Zamindari* system and the *Zagir Mahals* continued for a number of years even after India's independence. Following the abolition of Zamindari system and *Zagir Mahals* in 1953 the revenue department of government of Odisha took charge of the Chilika fisheries. The office of the *anchal adhikari* in revenue administration continued the lease system by leasing out fishery sources through open auction during 1953-1959. The structure and functions of the past and the current lease system appear in **Table 3.3**. There was some amount of confusion regarding allocation of lease areas during this transition period which marked the first ever formal arrangement

[17] The first settlement under British rule was concluded in the year 1804-1805 followed by a Triennial settlement from 1805 to 1808 and another one year settlement in 1808-1809. The Governor General started a detailed settlement from 1837 to 1845. Maddox has described the procedures and rules for settlement in his book "Final Report on the Survey and Settlement of the Province of Odisha". The subsequent settlement was taken up from 1890 – 1900, commonly known as the Maddox Settlement. [Online] URL: http://khordha.nic.in/departments/revenue.htm

in the post-independence era to dispense Chilika fishing rights (CFCMC records). This change also marked the beginning of direct bureaucratic control of the fishing areas and a visible shift towards the "first stage" in turning Chilika fisheries into state property.

Table 3.3: Details of the lease system in Chilika: Current and past

Key Features	Details
Duration of lease	• Annual, but renewable every year • During 1991 – 1994, duration of the leases was for three years
Lease fees	• Annual lease value is fixed at by adding 10 per cent over the previous year's lease value
Lease administration charges	• Ten percent administrative charges to FISHFED • Seven percent stamp duty for legal agreement papers
Functions and responsibilities of the Revenue Department	• Legally owns all fishery sources in Chilika • Leases out all capture fishery sources to the FISHFED • Monitors the fishery sources with regard to violations • Make rules and procedures for lease arrangements, including lease fees and duration of lease • Adjudicates on matters related to conflicts on fishery sources
Functions and responsibilities of the CFCMS	• Before its dissolution in 1988, the CFCMS used to have the same lease-related functions and responsibility as the FISHFED has now. • However, the difference being that under the CFCMS, all matters pertaining to fishing area lease were managed by the fishers themselves, whereas under the current system, the FISHFED is a bureaucratic institution managing lease matters.
Functions and responsibilities of the FISHFED	• Receive the lease of all fishery sources in Chilika from the revenue department • Administer sublease of the capture fishery sources to the affiliated PFCSs • Make lease agreements with each PFCS • Collect lease fees from the PFCSs and remains responsible to the revenue department for the final payment of all lease fees • Monitor the activities of PFCS and also the lease areas • Intervenes in disputes arising out of lease related matters
Functions and responsibilities of the PFCS	• Apply for leases at the FISHFED • Receive specific fishery sources on sublease through legal agreements • Responsible for making lease fee payments to the FISHFED • Further allocate fishing areas to the fisher households in the village • Responsible for timely application and completion of annual leases • Resolution of conflict over fishing areas among members

Source: FISHFED lease procedures and agreement book

In 1956, the state government brought in legislation declaring its complete ownership of the Lagoon. However, documentary evidence in the form of official records

suggests that such a move did not immediately lead to a complete halt of the accumulated rights of the fishers in Chilika fishing areas and to the management and use of rules crafted by the fishers over time. Moreover, as Chilika formally went on record as state property, the fishery sources, which had been continuously accessed and used by the fishers since the time of the Mughals or even prior to that period, became conspicuously known as "customary" fishing areas for the Chilika fishers. Thus, the dichotomy of state property and commons management in Chilika gradually emerged which eventually had far reaching consequences for fishers' access rights a couple of decades down the road.

Following the 1956 takeover, the state of Odisha continued a supportive relationship with Chilika fishers for about three decades through proactive policies and by not interfering too much in the evolving commons arrangements in Chilika. As an immediate step the Odisha government introduced the 1959 Chilika Reorganization Scheme by which a Central Fishermen's Cooperative Marketing Society (CFCMS) was created in Balugaon with a number of village level Primary Fishermen's Cooperative Societies (PFCS) as its constituent members. The revenue department began to administer fishing area leases to the PFCSs through the CFCMS as a fishers' apex organization (**Table 3.3**). This arrangement not only recognized fishers' continued access to their customary fishing areas but also allowed the fisher organizations to retain decision-making power with regard to such access. Some of the non-fisher villages contested the formalization of fishers' rights in Chilika and made petitions to the government asking for fishing rights in the Lagoon. However, the government was quick to reiterate through government orders in 1962, 1967 and 1974 that Chilika belonged to the caste-based fishers and non-fishers could not be given fishing rights in the Lagoon. A

letter, dated July 15, 1967, from the Deputy Secretary, Revenue Department, Government of Odisha to the Revenue Divisional Commissioners and District Collectors stated:

> I am directed to say that people living in villages around Chilika lake who are non-fishermen by caste have represented to Government from time to time that they have age-old rights by custom and practice to fish in the foreshore waters of Chilika and that their customary rights of fishing should be recognized. Government has carefully examined their claim and has decided that the non-fishermen in Chilika lake did not exercise such rights anytime before. However, the question of granting certain rights to the non-fishermen to catch fish in Chilika for their domestic consumption has been considered by government...

Thus, the relationship between the caste/class structure of Chilika and that of Odisha State is important to understand the actions of the State government in supporting a caste-based fishery system in Chilika. However, this relationship cannot be seen as a permanent feature because it changes over time. This aspect is further discussed in the next section to highlight how the State government's support to customary caste-based rights of the fishers up to circa 1980 gradually changed into undermining them through policies and new centralized institutions.

3.4.3 Politics around policies and institutions

3.4.3.1 Early changes in policy making

Even though it has not been an easy task because of the long history of fishers' customary rights in Chilika, the bulk of policy and institutional changes in the post-1970 period have been primarily aimed at overturning the process of increasing legal recognition of fishers' access and commons rights that had started during the pre-independence time and continued to be consolidated by the post-independence modern state. In doing so, the key strategy was to meddle with the already established system of

fishing area leases and institutional arrangements through several unfavorable policy changes which unsettled the fishers' access rights to customary fishing areas and subsequently brought them in direct confrontation with the State Government and the non-fishers. **Table 3.4** lists various related policy developments in the post-independence period.

Table 3.4: Chronology of important policy changes after Independence

Year	Nature of policy changes
1953	Abolition of *Zamindari* system and *anchal adhikari* took charge of the fishing area lease in Chilika
1956	Revenue department formally took over the ownership of Chilika while the lease was managed by the 'anchal adhikari'
1959	The Chilika Reorganization Scheme which established the Central Fishermen CFCMS and entrusted with the responsibility to lease the fishing areas from revenue department and then sublease them to the PFCSs
1962	"That in consonance with the objective of improving Chilika fisheries and to ensure proper, efficient and economic management of the fisheries, as far as possible the traditional rights, if any of the local fishermen to fish in a particular area will be maintained"
1974	"Fishery *sairat* sources in the state would ordinarily be settled in favour of bonafide cooperative societies, consisting of local fishermen and excluding middlemen and speculators……"
1978	The annual lease fee was doubled
1983	A ten percent increase in the annual lease fee was introduced
1988	Three year lease of fishing sources introduced "All fishery sources of Chilika shall be leased out in favour of the CFCMS and the they shall have powers to settle/lease out the source to affiliated PFCSs"
1991	• Provision of three year lease withdrawn and one year lease reintroduced • Fishery in Chilika was divided into culture and capture sources • Shrimp aquaculture legalized and non-fishers were given fishing rights • FISHFED was established as a centralized nodal fishery institution • Lease of fishery sources handed over to FISHFED • Annual lease fee was increased to twenty seven percent • CFCMS was dissolved
1992	Chilika Development Authority (CDA) was established and it took charge of the Lagoon
1993	Odisha High Court Order ruled in favour of the caste-based fishers and upheld their customary fishing rights
1994	Government order in favour of dividing Chilika into capture and culture sources at a ratio of 60:40
1996	Supreme Court directed that there be no aquaculture within 1000 meters of the Lagoon and made several recommendations for Lagoon management
1997	House Committee of Odisha State Legislative Assembly ruled in favour of banning shrimp aquaculture in the Lagoon
2001 and 2002	Odisha Fishing in Chilika (Regulation) Bill approved by the State Cabinet in 2001 and introduced in the State Legislative Assembly in 2002

As commercial motives and revenue orientation began to dictate government rules for Lagoon management, the first step was the introduction of a ten percent annual increase in the existing lease fees during 1965 followed by a government order in 1978 that doubled the lease fees. However, the longstanding demand of the fishers for settlement of the fishing *sairats* in their favour and granting of permanent tenure over such areas did not find a place in the new policies. Instead of fixed tenure, the government of Odisha changed the lease period from one year to three years through a law made in 1988. This law came into effect immediately and fishers got leases for their customary fishing grounds for three years from 1988 - 1991. Even though it was considered a positive step by the fishers, the law was withdrawn in 1991 and the lease duration was reversed to a one year period.

Members of the Fishers' Federation argue that the decision on the three year lease was taken by the then Congress Chief Minister, Janaki Pattnaik, to pacify the fishers who were campaigning against government's decision to close down the CFCMS and hand over administration of Chilika fishing area leases to a newly created state level agency, known as Odisha State Fishermen's Cooperative Federation (FISHFED). However, once CFCMS was dissolved and FISHFED took charge of Chilika fishing area leases, the 1988 policy was withdrawn. This decision of the government was also influenced by the strong aquaculture lobby which was against any long-term lease to the fishers.

3.4.3.2 Controversies around lease policy of 1991

In the beginning of the 1990s there was a consolidation of economic liberalisation processes and a formalisation of neoliberal policies in India. In the Chilika context, the

pressure on emerging capital to invest in shrimp aquaculture became intense thereby requiring the government to play its role as a facilitator of capital investment in the Lagoon and harness its contributions, in terms of export revenues, for the expansion of the national economy. Consequently, the State Government introduced a new policy in 1991[18] which became one of the landmark pieces of legislation because: 1) it created culture sources of fishery in Chilika in addition to the customary capture practices of the caste-based fishers; and, 2) it further increased the annual lease fee by 27 percent and made it mandatory for the lease to be administered by the FISHFED. Thus, the 1991 policy legalized shrimp aquaculture in Chilika and made provisions for non-fisher caste villages to engage in aquaculture. In accordance with this policy, 6000 ha of customary fishing areas were withdrawn from the caste-based fishers and reallocated to non-caste fishing villages. This loss of customary fishing areas by the fisher villages was in addition to the area already under encroachment by the powerful shrimp *mafia*[19].

Fisher cooperatives protested and challenged the 1991 policy in the Odisha State High Court. After prolonged legal battles, shrimp aquaculture was banned by the Odisha State High Court in 1993, the Supreme Court of India in 1996, and the Odisha State Legislative Assembly House Committee in 1997, and upheld the customary rights of caste-based fishers in Chilika (**Table 3.5**). Finally in 2001, the State Government banned shrimp aquaculture in the Lagoon and cancelled the 1991 lease policy. The support to customary rights of fishers by the higher courts is similar to Canadian experience with the

[18] The 1991 Chilika lease policy had symbiotic linkages with the formal acceptance of neoliberal economic policies by the county in that same year.
[19] *Mafia* word is commonly used in Chilika to highlight the process of criminalisation associated with shrimp aquaculture activities.

Berger Commission which recommended a ten year moratorium on the construction of the proposed Mackenzie valley pipeline. However, in Chilika, such far-reaching court decisions did not have much impact on the ground, as illegal shrimp aquaculture continues unabated (and illegally) as of 2011. According to conservative estimates, more than 60% of the Lagoon fishing area now remains under illegal shrimp aquaculture; according to *Seafood News*[20] the figure is closer to 80%. Apart from the encroached areas, fisheries areas allocated for aquaculture under the 1991 lease policy continue to be under the control of the non-fishers. Fishing areas that were used by fishing villages as caste-based commons have, in effect, become 'privatized'. The gap between higher court rulings and their implementation on the ground results from the lack of accountability of implementing institutions, and showcases the clout of capitalist forces within the ruling class in Odisha.

The increase in the annual lease fee by 27 percent[21] amounted to its doubling in less than three years. This enormous lease fee is unaffordable because fish production has plunged, bringing down fishers' income levels and forcing many to out-migrate (details discussed in Chapter 5 on livelihoods). Since the village level PFCS went out of business, the entire burden of the lease fee has fallen on the remaining fishers who have found it difficult to renew their lease.

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[20] Seafood News (http://www.seafood-norway.com/?lang=en) reported in 2005 that despite court orders restricting fish aquaculture in Chilika, about 80 percent of the Lagoon was taken up for shrimp aquaculture, and the fishers alleged that the court orders were being flouted.

[21] 10 percent lease fee to the revenue department, 10 percent administrative charges to the FISHFED and 7 percent stamp duty for lease agreement. The 17 percent towards administrative charges and stamp duty was introduced after lease matters were transferred from CFCMS to FISHFED.

Table 3.5: Observations and decisions by courts and committees on shrimp aquaculture

Institutions	Observations	Orders and decisions
Odisha State High Court, 1993	• "The non-fishermen in the neighbourhood villages of Chilika do also enjoy a traditional right to the fishing to the lake though on a limited scale may not be fully correct in as much as we do not read any traditional right of the non-fishermen in fishing" (Para-44 of judgement)" • "The fishermen living in and around Chilika do enjoy a traditional right to the fishery sources of the lake" (Para-28 of judgement)" • "The mafias are playing havoc today in the lake, as they have become the real monarch and determine the fate of poor fishermen. It is learnt that they are armed with deadly weapons like guns, revolvers, AK-47 and bombs. They symbolize encroachment and all acts of illegalities in the lake area, terrorize the local people and want to have a grip over the fishery sources (Page 63 and 64 of judgement)" • "Most of the mafia gangs are operated by large absentee landlords from Puri, Bhubaneswar and Cuttack. Many of these absentee landlords are important politicians or their relatives and bureaucrats of standing and moneyed people who apparently have a lobby with the Government. What can be more revealing, painful and distressing" • "At the heart of the problem lies the state government's commitment to promote prawn culture in Chilika"	• Recognized that the caste-based fishers in Chilika have sole customary rights over the fishing *sairats* • Observed that there was no historical evidence to prove that the non-fishers had any traditional rights to fishing *sairats* in the Lagoon. • Ordered the government of Odisha to reserve and protect all capture fishery sources in Chilika solely for the PFCSs
Indian Supreme Court, 1996	• Establishment of an authority to implement protection of coastal zones based on the principles of "precaution" and "polluter pays" • Elimination of aquaculture and industries in the coastal zones and creation of an Environment Protection Fund • Ban on converting agricultural, mangrove, and forest lands to shrimp ponds	• Banned shrimp aquaculture within 1000 meters of the Lagoon and declared this area as "No Activity Zone"
House Committee of Odisha Legislative Assembly, 1997	• "Prawn culture indirectly casts serious impact on the living conditions of the fishermen who depend on the waves of the mother Chilika to eke out their livelihood and such encroachments ultimately leads to exploitation of poor fishermen"	• Recommended in favour of banning modern shrimp aquaculture in Chilika

Source: AIR 1994 (Odisha High Court); AIR 1997 (Supreme Court); Supreme Court Case Finder 2000; Report of the Sub-Committee of the House Committee of Odisha Legislative Assembly 1997.

Despite a number of petitions and protests, the State Government has not changed the policy for lease fees. Fisher leader Krushna Chandra Behera of Berhampur village sees the Government's persistence with the high lease fee as a strategy to push fishers out

of the lease system. He said, “the strategy is to increase the lease fee so that the fishers lose their lease holding capacity; they either stop taking leases or take less area so that the Government can easily divert such areas to aquaculture.” The high lease fees have, in fact, resulted in a practice among most fisher villages of unofficially sub-leasing their customary fishing areas to outside moneylenders to recoup their costs. But such areas eventually end up being used for shrimp aquaculture. **Figure 3.1** shows that 96% of the lease-holding fisher villages admit that they had opted to sub-lease their fishing areas in order to pay for the otherwise unaffordable lease fees.

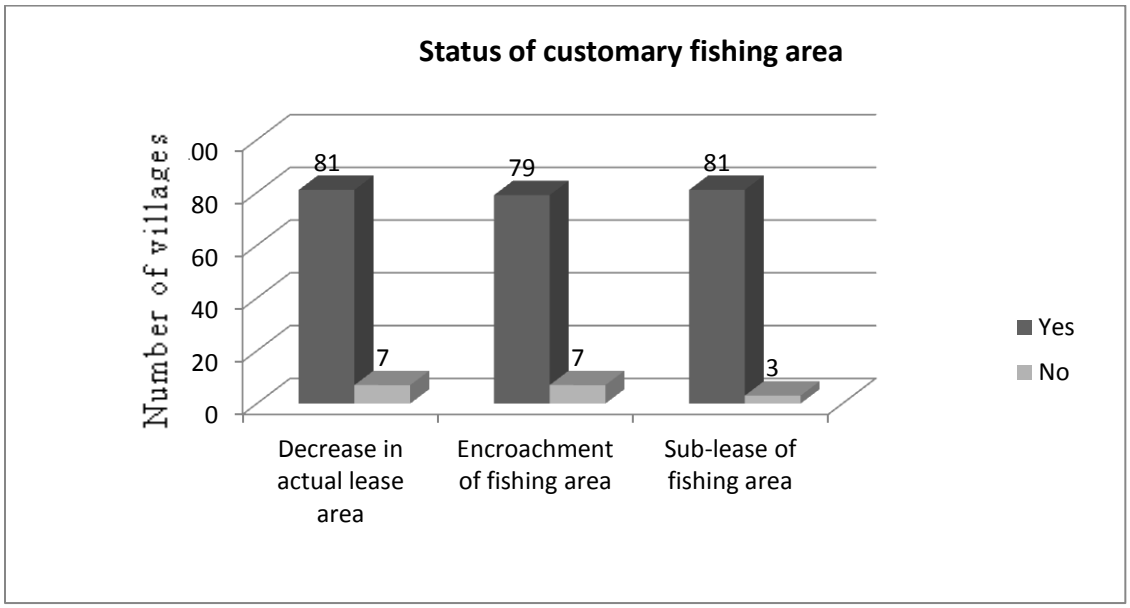

Figure 3.1: Status of customary fishing areas under impacts of aquaculture: number of villages that have lost fishing areas, villages that have areas under encroachment, and villages that sub-lease their customary fishing areas (percentages in the text are based on the actual number of fisher villages that responded either “yes” or “no”).

3.4.3.3 Changes in institutional hierarchies

The evolution of fishers’ rights in Chilika took place in parallel with the development of a rich set of local institutional arrangements. Prominent among the

institutions were the Traditional village committee, Primary Fishermen's Cooperative Societies (PFCS), Central Fishermen's Cooperative Marketing Society (CFCMS), *Jati Panchayats* or Caste Assemblies and Fisher Federation which offered a strong foundation for the fishers to consolidate their rights over the fisheries and maintain their relationship with the Lagoon. Therefore, any attempt to withdraw fishing rights from the fishers, such as the lease related policies, automatically meant weakening these institutions. Two developments are important in this regard, the creation of FISHFED and the CDA.

FISHFED was created in 1991 as a State level fishery institution with a centralized institutional structure for the regulation of fishery lease activities. Prior to this, the CFCMS used to take lease of the various fishery sources from the revenue department of the Government of Odisha and sub-lease them to PFCSs. The CFCMS, being a local institution owned and managed by the fishers themselves, was able to function in close collaboration with fishers' institutions and operate in a decentralized manner. In contrast, the creation of FISHFED at the state level brought in bureaucratic control over the entire lease process, making it cumbersome and virtually out of reach from the local fishers. Moreover, the exclusive nature of the CFCMS with regard to Chilika Lagoon and its fishers ceased to exist as FISHFED included all PFCSs within the Odisha state as its members. Therefore, it expanded the spectrum of fishery related dynamics and politics in Chilika to a wider arena, making it increasingly complex and vexing.

Another centralized autonomous agency known as the Chilika Development Authority (CDA) was created under the Forest & Environment Department of the Government of Odisha in the year 1992. CDA was assigned the objectives of conserving

the ecology of Chilika and improving all round development in and around the Lagoon. However, in spite of its creation as a nodal agency under the Chairmanship of the Chief Minister of the State, CDA did not play any significant role in major policy making activities on Chilika. In contrast, management of the Lagoon became strictly centralized under CDA which virtually took Chilika under its administrative control, putting the commons arrangements and fishers' way of managing the Lagoon at stake (See Chapter 6 for a detailed discussion on institutional dynamics in Chilika).

3.4.3.4 2001 Regulation of fishing in Chilika

In 2001, another controversial bill, known as the 'Odisha Fishing in Chilika (Regulation) Bill, was cleared by the State cabinet and placed in the State Legislative Assembly in 2002. The bill had several positive provisions that could have strengthened fishers' customary rights and created conditions for sustainable management of the Lagoon ecosystem. However, one controversial provision in the bill overshadowed all its positive elements. The bill promised to reserve 30 percent of the Lagoon fishing area for non-fishers and the PFCSs were entitled to lease the other 70 percent. While this may seem like a tilt in favour of traditional fisherfolk, the clause, in fact, virtually sanctions illegal encroachment of the Lagoon's waters by the shrimp lobby and gives non-fisherfolk groups a legal position in the whole fracas (Pattnaik 2006). The proposal to share customary fishing *sairats* with the non-fishers was seen as a gross violation of the earlier court orders and recommendations of the Legislative committees which had already recognized the customary rights of caste-based fishers to all the fishing *sairats* in Chilika.

The leaders of customary fishers worry that if the bill retains this clause after being enacted, the non-fisher groups will get the legal backing to continue to encroach upon their customary fishing grounds. They suggest that by allowing fishing rights to non-fishers, the State Government is seen to be indirectly promoting illegal shrimp farming, thereby defeating the very purpose of the proposed legislation. This will threaten the livelihood of the traditional fishing communities and cause damage to the fragile ecosystem of the Chilika. The State Government has tried to get the Chilika Bill passed in the Assembly several times during March 2002, February 2004, August and June 2005, 2007 and 2009. However, faced with strong opposition and protest movements from the customary fishers and their supporting organizations, it has not been possible for the government to make the bill into an Act. **Table 3.6** outlines the main provisions of the controversial bill.

Table 3.6: Main provisions of the Odisha Fishing in Chilika (Regulation) Bill

Key provisions	Details of the rules
Regulation of fishing	• No fishing in and within one thousand meters of Chilika in any manner other than by way of traditional methods of fishing • No fishing in eco-sensitive areas
Powers of District Collectors	• Grant lease of fishing areas to the FISHFED with the prior approval of the Government of Odisha and in a manner prescribed by the Act • Determine the leasable fishing area of Chilika from time to time in consultation with Fisheries, Animal Resources Development and Environment and Forest Departments. • Suspend or cancel fishing area lease to the FISHFED
Powers of FISHFED	• Sub-lease, in the prescribed manner, specific fishing areas to the PFCSs for a period of one year • Maintain a ration of 70:30 between PFCSs and Primary Non-Fishermen's Cooperative Societies (PNFCS) while implementing the sub-leases • Suspend or cancel fishing area leases to the PFCSs.
Powers of CDA	• Monitor on a concurrent and day to day basis and evaluate the fishing activities in and around Chilika • Maintain up-to-date records and information about the leased and sub-leased area • Undertake regular inspection to detect cases of violation • Demolition and removal of enclosures for fishing (includes shrimp) • Prepare annual environmental impact assessment reports • Power to examine, search, seize, confiscate documents and articles
Duties of Police Department	• Cooperate with CDA for enforcing the provisions of this Act • Communicate any information to the CDA on offences regarding Chilika • Availability and use of police or any other force for effective enforcement of this Act

Source: The Orissa Fishing in Chilika (Regulation) Bill, 2002 and its revised draft of 2007.

3.4.4 Dichotomy of conservation and development

Chilika is a Ramsar Site of international conservation importance and a hotspot of biodiversity, both nationally and internationally. Some rare, vulnerable and endangered species listed in the IUCN Red List of threatened animals inhabit the Lagoon. It is the largest wintering ground for migratory waterfowl found anywhere on the Indian sub-continent. The total number of fish species is reported to be more than 225. Along with a variety of phytoplankton, algae and aquatic plants, the Lagoon region also supports over 350 species of non-aquatic plants. A phytodiversity survey by CDA in 2002 has identified 710 plants in Chilika (within the water body, including the Islands and shorelines). A survey of the fauna of Chilika carried out by the Zoological Survey of India in 1985-87 recorded over 800 species in and around the Lagoon. This list includes a number of rare, threatened and endangered species, including the Barakudia limbless skink. Chapter 2 gives a detailed profile of Lagoon characteristics. The National Wetlands, Mangroves and Coral Reefs Committee under the Ministry of Environment & Forests, Government of India, has also identified the Lagoon as a priority site for conservation and management.

Chilika is not only known for its rich biodiversity but it is also an integral part of sustaining the livelihoods of about 200,000 fishers who live in more than 150 villages around it. The Lagoon ecosystem also supports 0.8 million villagers in the watershed areas. However, bringing a balance between the rich biodiversity of Chilika and fishers critical livelihood dependence on the Lagoon resources has long remained a contentious issue. The State Government seems to subscribe to the classic argument that ecosystem degradation and biodiversity loss is primarily caused by the poor, in this case the fishers

of Chilika, and has attempted to regulate their customary use of the Lagoon area through various means. One such initial step was taken when the State Government declared *Nalabana* Island and its adjoining waters (1553 ha) as a wildlife sanctuary in 1974. In the British survey records of 1897 and the lease records of CFCMS / FISHFED this particular area was mentioned as the exclusive customary fishing ground of four *Tiara* caste fisher villages in Banapur region. In one major stroke, their rights and entitlements were withdrawn, and the area where they had generations of livelihood rights was declared "restricted for conservation" without even a single attempt to consult these villages.

The State Government has plans to extend the current sanctuary area to 3885 ha and bring new areas in the Lagoon under protected area status for the protection and conservation of Irrawaddy dolphins, migratory birds and other eco-sensitive locations including the outer channel areas adjoining the new sea mouth. While "conservation without people" remains high on agenda of the State Government, its support for shrimp aquaculture and opening of a new sea mouth offers a strange dichotomy between conservation and development.

3.4.4.1 Shrimp commercialization and the curse of aquaculture

The first instance of commercialization of fisheries in Chilika can be traced back to the initiation of British control of the Lagoon. Fisheries in Chilika took a commercial form immediately after the British took over fishing activities in the year 1930. Kolkata (then known as 'Calcutta') was the usual market for Chilika fish. But, during the Second World War processed fish (boiling the fish before drying it in the sun) was regularly exported to Rangoon (Pattnaik and Mehrotra 2006).

Since the 1970s, a steady increase in the global demand for fish and a consistent decline in the total yield from capture fishery sources have brought aquaculture development to the forefront (Delgado *et al.* 2003; Pradhan and Flaherty 2008; Marshall 2001). In the case of shrimp, growing consumer demand in the North America, European countries and Japan gave rise to high international prices (Neiland *et al.* 2001; Bene 2005) thereby luring many countries into export-oriented shrimp aquaculture. The international market for shrimp and prawn developed in the 1970s; prawn in India that had little value previously became "pink gold" (Kurien 1992). Intensive shrimp aquaculture started in the late 1970s in India and gained momentum in the mid-1980s, putting India among the leading shrimp exporting countries in the world. The total value of export earnings from shrimp in the year 2004 was US$715 million (FAO 2006) and it has gone up since then. Chilika Lagoon, which was a natural area for tiger shrimp (*Penaeus monodon*), caught on to the trend in the early 1980s, as investors and policy makers found it highly suitable for intensive shrimp aquaculture. As the international price of tiger shrimps spiralled upwards, the stakes for the non-fishers in Chilika became formidable (Pattnaik 2007).

Soon shrimp aquaculture became a major driver of change in Chilika Lagoon. Its development spread with great speed and intensity throughout the Lagoon. Out of a total of 140 fisher villages surveyed, 135 stated that they were adversely impacted by shrimp aquaculture in Chilika. In the fishers' own words: "the onset of shrimp aquaculture in Chilika pushed us from the sky to beneath the bare ground [*Chingudi Chasa aamaku akasaaru patalaku theli dela*]". Four impacts of aquaculture contributed to this growing sense of marginalisation.

First, an emergent culture of encroachment developed, whereby non-fishers (and some fishers), driven by profit motives and supported by elites in the bureaucracy and political circles, took up large-scale aquaculture. In the process, they started taking over customary fishing areas that were earlier controlled by caste-based fishers and converted these into shrimp farms. The fishers soon found that the Lagoon was virtually taken over by non-fishers and the "shrimp mafia". **Figure 3.1** (pg. 86) documents this claim by showing the encroachment on customary fishing areas in 91% of the lease holding fisher villages in Chilika. Second, motivated by the prospects of foreign earnings through shrimp exports, there were significant changes in the earlier government approach to the management of Chilika. The policy support for the caste-based capture fishery was withdrawn in support for the aquaculture-based fishery and the extension of rights to non-fishers. There were even moves by the Government to bring in "holding companies" like the Tata Company to take up intensive shrimp aquaculture in Chilika. Third, developments with regard to fishing area encroachment and leases have led to issues of fishers' access and entitlements (Discussed further in Chapter 5). Fourth, aquaculture has led to a steady erosion of local institutions in Chilika. With the loss of fish resources, most village fisher cooperatives went out of business and became largely non-functional (Discussed further in Chapter 6).

3.4.4.2 The "artificial" sea mouth

A significant feature of coastal lagoons is the opening to the sea ("sea mouth"). The natural Lagoon opening can be at different locations. In Chilika, the sea mouth remains functional throughout the year with daily inflow and outflow of water that follows periods of high and low tides in the Bay of Bengal, with seasonal variation in the

rates of inflow and outflow. Oral history (discussion with Banshi Dhara Behera and other committee members of the Kaluapadara cooperative society) indicates that Chilika's Lagoon character was maintained by seven sea and river mouths that shaped the nature of its ecosystem. Most of these mouths were closed over a historical period of time; currently there are only two functional mouths with the Bay of Bengal. However, by the beginning of the 1990s, these remaining sea mouths were getting blocked. The flow of sediments from the rivers into the Lagoon was not being flushed out to the Bay of Bengal, resulting in Lagoon siltation. Sea mouths tend to close down naturally over a period of time and they need to be maintained in order to keep them active and functional. Other than natural factors, the main reason for the sea mouth closure was the excessive rate of siltation in the Lagoon caused by the flow of sediments from large-scale degradation in the catchment areas of Chilika.

As a response to this problem, the State Government dredged out an artificial sea mouth in 2001, creating a connection between the sea and the main basin of the Lagoon (**Figure 3.2**). Local fishers view the new sea mouth as a mistake because it was created at a location which increased the intensity of water inflow and outflow with daily high and low tides. In contrast to the old sea mouth where the daily inflows and outflows were buffered by the presence of channels and islands, the new sea mouth, efficiently engineered to flush out sediments, allowed in too much sea water. This inadvertently resulted in ecological and livelihood impacts.

The changes included; (1) disturbance of the salinity regime and the fresh water-salt water balance; (2) changes in the nature of the water inflow and outflow and in the force of water during high and low tides; (3) an increase in sand infestation especially in

the Lagoon outer channel areas that are in proximity to the new sea mouth; (4) random changes in the depth of the water; (5) invasion of barnacles affecting both fishers and their equipment; 6) the sudden appearance of what local people call “sea creatures”: stingray (*Trygon sephen*), octopus (*Cabreana octopus*), jelly fish (*Cnidaria scyphozoa aurelia*), and others. The most significant impact of these changes was felt through an increase in the variability, uncertainty, and unpredictability of events associated with the Lagoon, such as fishing seasons for species, with impacts on fish production and livelihoods.

Figure 3.2: Image showing the location of various sea mouths in Chilika

Fishers from 130 villages out of the 140 surveyed claimed that there were no consultations by the Government before the opening of the new mouth. Asked under the Right to Information Act, the CDA replied that they had conducted a few public consultations on the opening of the new sea mouth but they did not document the process.

In the fishers' opinion, it would have been useful to renew the existing natural sea mouth instead of creating a new one in a different location. However, not all fishers reported adverse impacts from the new sea mouth on Chilika and their livelihoods. Of the 140 fisher villages, 71 indicated that the sea mouth had a major impact; the others – those that live in villages further away from the sea mouth – did not consider that they were strongly impacted. To put the two major drivers in perspective, 135 of 140 fisher villages reported that they observed significant changes in the ecological character of the Lagoon due to the impact of shrimp aquaculture.

In the two study villages, none of the fisher households identified any positive impacts of the sea mouth. In response to question 6.1 in the household survey relating to sea mouth impact, all households in Berhampur said they had been negatively impacted. In Badakul only 35% indicated negative impacts. Fisher village location in relation to the sea mouth was a major factor in the response. Those who did not think they had been negatively impacted did not feel that there were positive impacts either. All fisher households agreed that the Lagoon condition was deteriorating and fish production had gone down. However not all of them linked these changes with the sea mouth clearly, as many of them had not even seen the sea mouth because of the distance. Rather, these fishers linked the adverse changes to aquaculture and condition of river channels (fresh water sources of the Lagoon) and some even talked about massive forest degradation in the catchments as affecting the Lagoon.

3.4.5 Fishing as a lifelong "movement"

Several parts of India have witnessed rising people's movements to protest the increasing marginalisation of resource users (Chapter 1). There have been both success

and failure with regard to these efforts. Popular movements arising from resource conflicts have successfully led to the creation of three new tribal-dominated states. However, the results of these demands have not been very encouraging. The very factors, history of marginalization of resource users, loss of cultural identity and relative deprivation that had led to the demand for separate states, continue to prevail. The level of dissatisfaction among people regarding the political and developmental processes in these regions, even after their initial success in achieving statehood, has led to the intensification of Maoist insurgency in certain parts and other forms of rebellions elsewhere (Milkan 2009; Bahree 2010; Shah 2011). These earlier experiences with people's movements offer important lessons for Chilika's future in terms of fishers' ongoing protest movements. It suggests that while there may be moments of success in movements by marginalised local people, long-term results remain uncertain.

Popular movements and uprisings have been an important part of the colonial and modern Odisha political history. Mohanty (1991) records several such instances that owe their origin to the prevailing socio-political circumstances. In the recent decades, Chilika Lagoon and its fishers have witnessed unprecedented levels of environmental, economic, social, cultural and political change. Fisher leader Gagan Jena observed, "living on the Lagoon is not an easy job. A life as a fisher has become one of constant struggle to which we do not see any immediate end. We have already lost our sources of food but we will fight to the end to keep up our dignity." There is much evidence of protests and movements by Chilika fishers as a response to the growing involvement of outside interests in Chilika and its significant effects on their lives and livelihoods. Among the

numerous mass protests held by Chilika fishers I mention here three important landmark movements that took place during the last three decades with varying degrees of success.

First, when encroachment on customary fishing areas by shrimp aquaculture was at a high, the then Congress Party led State Government signed a memorandum of understanding with the Tata group, a large Indian holding company, to start a shrimp procurement and export business in 1986. Known as the Tata Aquaculture Project, it received a lease of 600 hectares of fishing area within Chilika, violating all the legal norms including environmental laws. Biju Pattnaik, who was then the leader of the opposition, challenged the decision and promised to drive out Tata once he was voted to power. However, after he became the Chief Minister in 1991, a new agreement was signed with the Tata Company thus expanding the lease area to 1400 ha. At the same time, his government brought out the 1991 lease policy dividing Chilika between fish-capture and prawn-culture thereby encouraging the shrimp mafias to violate all existing legal provisions and encroach upon the fishing rights of the customary fishers.

With their livelihoods threatened, the fishers responded by launching a mass movement against both the Tata and the Biju Pattnaik Government. They were united under the banner of *Chilika Bachaoo Andolan*[22] (Save the Chilika Movement) and supported by the Chilika *Matsyajibi Mahasangh* (Chilika Fisher Federation) and Communist Party of India (ML) and many other civil society organisations. In September 1991, they held a mass demonstration with over 8000 people before the State Assembly

[22] A civil rights movement in 1990s, mostly by Chilika fishers, against the Integrated Shrimp Farm Project (ISFP), a joint venture by the Tata Iron and Steel Company and Government of Odisha. The fishers were supported by the students, intellectuals, environmentalist and human rights activists.

at Bhubaneswar asking the government to stop the Tata project. In February 1992, the enraged fishers destroyed the shrimp culture farms of the Tata Aquaculture Project. Their representatives lobbied at the national level to stop the Tata project. Due to the pressure of a continuous and powerful mass movement of fishers the Tata project was denied an environmental clearance by the Central Government's Environment Ministry. Even though project development activities had started, the Tata Company decided to pull out of the Chilika owing to sweeping protests by fishers. However, leased area under the project remained in dispute and had not been returned to the right holder fisher villages as of 2010.[23]

Second, the 1999 anti-aquaculture protest movement was launched by the Fisher Federation with support from the National Fish-workers' Forum (India) and the World Forum of Fish-harvesters and Fish-workers. This movement was a follow-up to the Supreme Court orders of 1996 banning shrimp aquaculture within 1000 meters of the Lagoon. There were also earlier orders by the State High Court which had banned shrimp aquaculture. However, even years after the judgments, the government did not initiate any concrete actions to stop the spread of aquaculture in the Lagoon by implementing the court orders. On May 28, 1999 the fisher organizations gave an ultimatum to the government to demolish all infrastructure relating to shrimp aquaculture in the Lagoon within 24 hours time. When the government did not respect the ultimatum, the fishers moved in and demolished eleven illegal prawn farms in Chilika. This was a blow to the

[23] Area under the project remained 'free for all' (or open-access) for a period of time before being encroached by Panasapada, a powerful non-fisher village, and put under shrimp aquaculture. Siara Gola village, the original right holders of the encroached area, continues to make petitions for the return of the fishing area both at the district and State administration levels but without any success.

prestige of the higher caste elite shrimp farm owners including their political and bureaucratic supporters. As a show of power, police reacted violently and raided village Sorana (where the fisher leaders were gathered) beating the villagers, using tear gas and shooting some of them. This resulted in the death of four innocent villagers following which the movement spread across the state and also received support from national and international organizations condemning the police action, in particular, and the State Government's inability to conclusively deal with aquaculture problem in the Lagoon, more generally.

In the aftermath of the police brutality, fishers intensified their protest by blocking the highway and railway communication networks with eastern India came to a standstill. At the state capital, Bhubaneswar, 600 women carrying their children stopped trains, following which all trains were cancelled. Thousands of fishers and their supporters made a human wall in the city and a complete *bandh* was observed. The police arrested 2000 people including fishers and workers of different political groups. A commission of enquiry was set up. Ironically, the commission supported the 1999 police action in Sorana village blaming the fishers for instigating that incident.

Third, fishers' struggles for rights in Chilika received a serious setback when, in 2001, the Odisha Fishing in Chilika (Regulation) Bill was passed by the state cabinet and brought in by the Odisha State Legislative Assembly. The fishers opposed the bill, more specifically its controversial provision to divide Chilika fishing areas at 70:30 ratios between the fishers and non-fishers. The bill was to be introduced in the Odisha State Legislative Assembly on December 20, 2003. When their request to withhold the bill was not accepted by the government, thousands of Chilika fishers held a siege of the capital

Bhubaneswar for four days starting on December 17, 2003 demanding that the bill be dropped. This movement was led by the *Chilika Matsyajibi Mahasangha*, in which the Communist Party of India (ML) also participated. Massive demonstrations, mass *dharnas* and a blockade of rail and roads were organised. The fishers took the approach of "do or die" and were prepared to face any consequence for their opposition to what came to be known as a "Black Bill" in the history of Odisha.

This mass movement created pressure on the opposition as well as on the ruling government. Consequently, the entire opposition in the State Assembly opposed the Bill when it came up for discussion. Surprisingly, some of the ruling party MLAs threatened by the mass upsurge also opposed the Bill, This turned out to be an embarrassing situation for the Biju Janata Dal (BJD)-Bharatiya Janata Party (BJP) coalition government which, despite having an absolute majority in the State Assembly, was forced to defer the bill with a plea to sending it to a select committee. It was considered a rare case in the history of the Odisha State Assembly, as never before was a bill deferred at the passing stage in response to the pressure from a powerful mass movement. The State Government has tried to pass the bill in the subsequent years but vigilant fisher organisations and their mass protest movements have kept the bill from being an act until now.

Other than mass movements, the fishers have also used strategies to involve the judiciary and civil society organizations in advocating for their rights. The example of several court cases on the 1991 lease policy leading to the State High Court and the Supreme Court of India upholding the demands of the fishers are examples of such advocacy efforts. Even though the current rate of marginalisation may suggest that the

fishers are inherently powerless, it is not the case in reality. There is enough evidence that they do have influences on political process affecting their lives – such as successful court decisions banning shrimp aquaculture, inability of the government to pass the Chilika Bill and the pull-out of Tata. Despite these successes, the small-scale fishers can definitely be seen as less powerful than the aquaculture industry which influences the entire process of negotiations on resource rights and decision-making in Chilika.

3.5 Linking Fishers' Metaphors with the Narratives

The conceptual narratives are thematically linked to one of the four metaphors given by the fishers (**Table 3.7**). The metaphors offer practical clarity to the narratives and help situate them in the context of Chilika. The narratives offer a conceptual foundation to the fishers' metaphors, and help us understand the specific history and politics in Chilika within a broader political-ecological context. **Table 3.7** shows that each of the metaphors matches with one narrative and their linkage is supported by relevant aspects of the Chilika Lagoon case. However, the link between the metaphors and the narratives is not one-to-one. Rather, each metaphor has something to contribute to our understanding of all four narratives and vice-versa. The metaphors and narratives together help build a complete picture of fishers' marginalisation and the social-ecological changes that triggered it.

Metaphor one, along with its supporting narrative on *degradation and marginalization,* focuses on the critical link between ecosystem health and resource status with the ongoing process of marginalisation in Chilika. It explains the major drivers behind the overexploitation and degradation of fishery resources, and the resulting

downward shifts in fish production which have pushed the fishers into a vicious cycle of poverty and marginalization. It challenges the notion that state development interventions, which increasingly swing in favour of neoliberal policies, can lead to resource conservation *and* address the livelihood and poverty issues of the poor. Instead, the analysis suggests that local small-scale resource production and use systems may have the potential to create, even though on a smaller scale, conducive environments for both ecosystem maintenance and economic growth.

Table 3.7: Linking fishers' metaphors with the narratives

Fishers' Metaphors	Political Ecology Narratives	Relevance of Chilika case
Metaphor 1: "Chilika was our "bhata handi" [rice pot], and our local bank [fish as cash]"	Degradation and marginalization	Impact of pink gold rush and shrimp globalization; Policy and practice of overexploitation by others; Overexploitation by fishers themselves; State development interventions for alternate livelihoods for fishers such as goat projects and eco-tourism; State conservation interventions for ecosystem improvement such as sea mouth, dredging.
Metaphor 2: "Mother Chilika is crying"	Conservation and control	Nalabana Bird Sanctuary declaration; Restricted areas for dolphins; Restricted areas near sea mouth; Opening of new sea mouth; Aquaculture; Government policies; Capture fishery as unproductive
Metaphor 3: "What do we do when the *Brahmins* and the *Karans* like fishing"	Environmental conflict	Encroachment on customary areas by aquaculture; Fisher and non-fisher conflicts; Community vs. state conflicts; Restrictive policies favouring non-fishers, aquaculture and industry; institutional build-ups
Metaphor 4: "For the poor, when hunger becomes unbearable, movement becomes our last resort"	Environmental identity and social movement	Caste conflicts; Movement against Tata; Struggle against aquaculture in general; Protests against sea mouth; Protest against Chilika Bill; Court cases against lease policy

In Chilika, environmental change is a product of the long history and intense politics to which the Lagoon and its people have remained exposed for more than three centuries. Consequently, the Lagoon, which the fishers thought was a constant source of

food (rice pot) and economic wealth (cash in bank) has lost its productivity through overexploitation and eventually become a source of their growing poverty and marginalization. Several drivers contributed to this change. First, small-scale fish commercialisation that started during the British rule in the early 19th century culminated in full-scale shrimp globalisation within a few decades. The influence of the global shrimp market and the "pink gold rush" transformed the local production system from a capture fishery to a culture-based fishery. Intensive aquaculture activities impacted the Lagoon ecosystem aggravating its degradation. Second, a series of changes in government policy created space for greater integration of the Lagoon fish economy in regional and global markets thereby paving the way for economic overexploitation of the Lagoon. Third, conservation and development interventions, such as the opening of the artificial sea mouth, became additional factors for ecosystem disturbances in the Lagoon with adverse consequences for fish production. The combination of all these drivers contributed to the loss of subsistence and livelihoods of the fishers, and landed them in a poverty trap.

Metaphor two with support from the *conservation and control* narrative explains some of the implications of ecological changes for marginalisation, thereby emphasising the importance of considering the Lagoon as a linked social-ecological system. The Chilika case supports this narrative in at least three ways. First, the ongoing degradation of the Lagoon and loss of its productivity was blamed on the fisher communities and the State Government regained control of the Lagoon in order to achieve better conservation. Fishers, who were able to craft local norms, practices and institutions for sustainable management of the Lagoon, were seen as its enemy. A government decision to create the

Nalabana Bird Sanctuary, abolishing years of access and use rights of fisher villages in their customary fishing areas, was an example of such centralized conservation efforts whereby the State took control of areas, previously under community control, in order to preserve "nature." Similarly, the unilateral decision on opening the new sea mouth was based on the presumption that conservation of the Lagoon can be achieved though such interventions.

Second, the local production and livelihood system was impacted by several external drivers such as state level policy changes, opening of the artificial sea mouth, intensive shrimp aquaculture, and the influence of the international market, all of which contributed to the systematic weakening of local fishery-based livelihoods (further discussed in Chapter 5), fish production in the Lagoon and to the incapacitation of the local social-political institutions (further discussed in Chapter 6).

Third, resource use and management practices of the fishers were challenged by the State and private entities as being unsustainable, often as a strategy to take control of resources. The fact that these community-based systems had evolved over a historical time, based on the learnings of fishers through their interaction with the Lagoon, was completely overlooked. Thus, the capture fishery was termed as unproductive as attempts were made to replace it with a culture-based fishery. Local indicators of social-ecological change were challenged by scientific management of the Lagoon resources. Local indicators such as an increase in barnacles on the Lagoon floor signify a host of meanings: more salinity, less fish, physical impediments to fishing, threats to the Lagoon ecosystem as well as the local economy. Similarly, the absence of dolphin vomit, a regular phenomenon earlier (fishers think dolphins overeat when food is plentiful), is

commonly understood as due to a lack of both fish as food for dolphins and dolphins themselves. Paradoxically, the State Government spends thousands of dollars through formal scientific studies to confirm the status of salinity, fish stocks, and the number of dolphins.

Metaphor three and its supporting narrative on *environmental conflict* deals with issues around resource access and institutions, and helps us understand the nature of fishers' marginalisation from a political and decision-making point of view. Over the last four decades Chilika has become a hotbed of caste and class conflicts. Traditional caste structures and dynamics have been an integral part of Chilika fisheries for generations. However, they are not free from equity concerns that are inherent in the caste system, and this applies to the dynamics within fisher castes and between fishers and non-fisher castes. Thus, caste politics and dynamics exist not only between fishers and non-fishers, but also between different fisher castes. The discussion on the distribution of fishing rights (which fisher caste, can fish where, when, how and for what in Chilika) within the fisher castes exist in Chapter 4 (**Table 4.2**). This raises a number of equity concerns, and suggests that these arrangements may represent structures of exploitation, even though they may help clarifying rights.

Nonetheless, caste has played a significant role in the shaping of resource access and use rights in the Lagoon. There were conflicts in the past but the resolution of the same was mostly achieved through caste norms and agreed upon "rules of business" among different castes. Class-based resource conflict is a phenomenon that came into prominence only in the recent decades. There is also growing politicisation of caste and

an emerging class structure is gradually taking shape, both of which contribute to environmental conflicts in Chilika.

Three distinct types of environmental conflicts were observed in the case of Chilika. First, there were growing tensions between different caste-based fishers as they began to compete for scarce resources due to degradation and loss of productive. Caste rules that once determined customary boundaries and limits of resource appropriation started to be dismantled. Differences based on caste stratification and related equity issues (**Table 3.2 in Chapter 3 and Table 4.2 in Chapter 4**) that were once non-issues became points of major contestation between various caste-based fisher groups.

Second, conflicts between caste-based fishers and non-fishers of higher castes became prominent. As commercialization and shrimp globalization redefined the economic potential of the Lagoon, newer caste groups, for whom fishing used to be a social stigma and involvement in it resulted in social ostracism, started to stick their claims over the Lagoon resources. Shrimp aquaculture became the major motivation for this new group of higher caste elites who began to encroach upon customary fishing areas of caste-based fishers and put them under aquaculture. This type of "elite capture" (Bene 2003) has been strongly resisted by the caste-based fishers as they continue to be challenged by the money and muscle power of these groups.

Third, the State Government's attempts to transfer customary fishing areas to non-fisher higher castes and corporate houses through new legislation have brought them into direct conflict with the caste-based fishers. The government has brought out new policies supporting the aquaculture based fishery in the Lagoon and protecting the interests of the

higher caste non-fishers. While the State government has consistently denied the importance of the customary capture fishery on the plea that it is not profitable, its policies have aided a process of valorisation of capital in favour of aquaculture promoters. This has been contested by the fishers both in the courts of law as well as through direct protests and confrontations with the government. On the whole, the different types of conflicts in Chilika exemplify the signs of growing powerlessness of local fishers as they continue to be deprived of their customary access rights and get embroiled in caste and class conflicts primarily due to the growing intensity of shrimp aquaculture. Moreover, loss of village, regional, and caste conglomeration and its effects on the institutions has further increased the political isolation of fishers. Loss of commons institutions, as part of a loss of commons access, is a phenomenon that has been noted elsewhere (Beck and Nesmith 2001).

Metaphor four with the narrative of *environmental identity and social movement* reminds us that the fishers are not just mute spectators of the large scale changes happening around them; they respond to situations of marginalization. In the context of Chilika, fishers' responses to the adverse changes in social, ecological and political environments around them have mostly taken the form of movements involving protests, mass rallies and court challenges. A number of movements have been discussed in the previous section of this chapter, based on which I come up with four particular observations with regard to the nature of fishers' movements in Chilika.

First, movements were primarily issue-based – they started when a particular concern became critical enough to threaten the fishers with serious consequences and as

soon as the concern was addressed the movement behind it came to a close. The successful closure of the Tata integrated shrimp aquaculture project can be taken as an example here. Second, fishers stood united on some but not all issues. Their differences in terms of caste and geo-political location influenced their decision to participate in the movements against any particular issue. For instance, everyone felt shrimp aquaculture was the number one enemy of the Lagoon and the people who depended on it. However, fishers were divided on the issue of the new sea mouth resulting in no significant opposition to its making. Thirdly, movements on which fishers collaborated with other organizations, such as the Communist Party of India (ML), National Fish-workers Forum (India) and the World Forum of Fish-harvesters and Fish-workers, etc., were more successful. Fourth, fisher organizations have become weaker in recent years and their ability to organize mass movements has significantly decreased. For example, the hydrological intervention made by CDA to open up an artificial sea mouth, though contested by the fishers, was never challenged through strong mass movements. The caste and political divisions among the fisher groups have become more intense that has left the fisher organizations clueless on any particular strategy to continue their movements as they were able to do it before.

3.6 Links to the Three Key Issues Addressed by the Thesis

These narratives, as explained through the history and politics in Chilika, direct our attention to three distinct areas that need to be explored further as part of this thesis. First, the emergence of a host of factors that contributed to an increase in the loss of collective rights of fishers, resulting in questions about access rights and “ownership” of the Chilika fishery commons. Second, the social-ecological and political changes, as

influenced by the complex process of history and intense politics, have pushed the lives and livelihoods of Chilika fishers into a transition phase, the nuances of which are fast acquiring a permanent character. The failure of the state to protect the lower caste fishers needs attention and its underlying reasons require further analysis. Third, from a decision-making and resource governance point of view, Chilika and its fishers are facing an extreme "poverty of institutions" where the fishery institutions and many other institutions linked to them across multiple levels are undergoing a process of gradual decline. The State has welfare responsibilities with regard to individuals and institutions as a result of which its role cannot and should not be subservient to the forces of capital. The next three chapters examine each of these areas in detail.

CHAPTER 4

COMMONISATION AND DECOMMONISATION:

CHALLENGES IN KEEPING THE COMMONS AS COMMONS[24]

4.1 Introduction

Chapter four examines the question of "how to keep commons as commons" in the face of growing challenges from external drivers, through the analysis of various contributing factors and dynamics associated with understanding commons as a process. The main focus of this chapter concerns how Chilika Lagoon, basically under a state property regime, was commonised through customary use by caste-based fisher communities and later made official through a lease system by the State of Odisha, and then how this commons system broke down and was decommonised after the rise of shrimp aquaculture and aquaculture politics, among other factors. I analyse various contributing issues and dynamics associated with the processes of commonisation and decommonisation. Following a section on study area and methods, I explore both commonisation and decommonisation through (1) the key factors shaping commons use in Chilika, and (2) the key factors in the loss of collective fisher rights. I then discuss some of the major trends to have emerged from these processes. I conclude by considering lessons on "how to keep commons as commons" in the face of growing challenges from external drivers whose influence operates at multiple scales.

[24] An earlier version of this chapter has been published as: Nayak, P. K. and F. Berkes. Commonisation and decommonisation: Understanding the processes of change in Chilika Lagoon, India. *Conservation and Society* 9(2):132-145.

4.2 Perspectives on Commons as a Process

Property rights to resources are dynamic. What appears as a stable property rights regime at one time scale may be undergoing change at another. These changes respond to economic, social, and political drivers, defined in the MEA (2003) sense. The changes may be manifested as adaptation or fine-tuning over time, as seen in Swiss alpine commons (Netting 1976) and Japanese village common lands (McKean 1982). In some cases, the changes may result in the replacement of one kind of property rights regime by another, as in the enclosure movement in England that resulted in the conversion of sheep grazing commons into agricultural holdings (Dahlman 1980). In other cases, the drivers may result in cycles of change, as in Sri Lanka's Negombo Lagoon shrimp *kattudel* (a type of trap net) fisheries (Atapattu 1987) and southern Brazilian Lagoon fisheries for shrimp (Seixas and Berkes 2003).

I use two related concepts (commonisation and decommonisation) in the analysis of change in the governance of Lagoon commons. Commons or common pool resources share two characteristics. First, the exclusion or the control of access of potential users is difficult. Second, each user is capable of subtracting from the welfare of all other users (Ostrom 1990). Thus, common pool resources are defined as those "in which (i) exclusion of beneficiaries through physical and institutional means is especially costly, and (ii) exploitation by one user reduces resource availability for others" (Ostrom *et al.* 1999: 278). Here "commonisation" is understood as a process through which a resource gets converted into a jointly used resource under commons institutions that deal with excludability and subtratability, and "decommonisation" refers to a process through

which a jointly used resource under commons institutions loses these essential characteristics.

Given that the difficulty of excludability and subtractability always exist, in what sense can a commons be defined? There is a continuum of solutions to excludability and subtractability problems. In Chilika, before the development of aquaculture local institutions and their relations with government institutions were able to deal with excludability and subtractability. However, with the advent of aquaculture new problems emerged regarding the question of excludability and subtractability. Thus, an important aspect of seeing commons as a process pertains to the questions of excludability and subtractability. The processes of commonisation and decommonisation are continuous and potentially two-way because they are influenced by prevalent social, economic, political and ecological drivers. Any resource can enter into a process of commonisation; already established commons or resources that are being commonised could also revert back into decommonisation. Using Chilika Lagoon as a case in point I illustrate how resources can be commonised and decommonised, examining key challenges regarding (1) social costs, equity and marginalisation (Narayan *et al.* 2000a); (2) the significance of power relations and the importance of political ecology for commons (Johnson 2004; Robbins 2004); and (3) how commons can be managed as commons in the long run (Ostrom 1990).

4.3 Commonising the Lagoon: Key Factors Shaping Commons Use in Chilika

Several factors acted together to shape the formation of commons in Chilika Lagoon **(Table 4.1)**. These factors were rooted in the social, cultural, economic, ecological and political history and traditions of the area, and the influences of several external drivers. Ostrom (1990) identified eight "design principles" for collective action for common pool resource management. Agrawal (2002) extended this list to a total of twenty four enabling conditions for sustainable commons use. He argued that the large number of variables potentially affecting the sustainability of common resources and their use, had important theoretical implications for future research. The study in Chilika shows that a number of factors shaping commons use in Chilika confirms to these design principles (Ostrom 1990) and "sustainability variables" (Agrawal 2002). In this analysis, I argue that external drivers can be of key importance, in addition to the mainly internal variables that Ostrom (1990) and Agrawal (2002) emphasised.

Studying the evolution of commons rights is a complex process, as shown in Robert Wade's book "Village Republics" (Wade 1988) about India and McKean's (1982) work on Japanese common lands. Since commonisation is seen as a process with many stages, it is not possible to give actual dates for the process as a whole. Commonisation does not occur at a discrete point in time but follows a series of events and these may be dated, as done below. A similar trend is also associated with the process of decommonisation where different factors contribute to it at different time periods and it is not realistic to give a particular date on which the overall process of decommonisation took place. While this section on commonisation and the following section on

decommonisation try to capture various events and developments contributing to these two processes in Chilika, I do not attempt a historic reconstruction.

Table 4.1: Key factors of the commonisation process in Chilika

Key factors	Manifestations
Favourable resource conditions	• Sound ecological health and a good resource base • Better ecological condition of resource and regulated fishing practices favoured high productive • Higher incomes from fishing and everyone got a share of benefit • Economic benefits kept levels of competition and conflicts low
Relatively low population densities	• Small population size meant less fishers • Easier for fishers to form more cohesive and manageable groups
Rules about inclusion and exclusion (based on caste)	• Only fishers by caste allowed to engage in fishing • Caste-based norms specified fishing rights and entitlements
Clear rights and entitlements	• Caste norms for use and management of Lagoon resources • Customary practices established specific rights of fishers with regard to access, use, management and membership • Resource rights mutually sanctioned by caste users and recognized through legal arrangements • Lease system protected interests of customary fishers by providing exclusive rights
Strong (nested and multi-level) fisher institutions	• Fishers' institutions at various levels, i.e. from village to regional • Distribution of functional responsibilities amongst institutions • Community-based institutions in command
Fishing practices	• Caste-based, season-based, species-based, and location specific • Considered needs of each caste and allocated separate fishing techniques which helped reduce conflicts • Focused on the seasonality of Lagoon and its species; value the importance of resource sustainability • Based on collective action involving either a big group of villagers or the entire village (fishing as group activity)
Supportive Government policies	• Approach of minimal or no interference • Favoured capture-based fishery • Recognized caste-based arrangements for fisheries management
Sense of connection to Lagoon	• Social and economic benefits, ecological and political advantages, cultural practices kept fishers connected to the Lagoon • Give meaning to fishers' life • Living with the Lagoon: fishing as a "way of life" and Chilika as a mother (concept of "*Maa* Chilika")

4.3.1 Resource conditions and population density

Both oral history and documented evidence[25] indicate that Chilika Lagoon enjoyed a good resource base until about the end of the 1970s. The Lagoon interacted with the Bay of Bengal through a naturally existing sea mouth and fifty-two rivers and rivulets supplied fresh water. The combination of variables (water depth, salinity levels and pace of water flow) provided for a productive ecosystem and habitat for numerous species of flora and fauna (Asthana 1978). The ecological history of the Lagoon provides an understanding that the state of its ecosystem health and resource sustainability acted as a crucial driver of commonisation. My analysis based on two focus group discussions on the history of Chilika Lagoon management suggests that good resource conditions and regulated fishing practices favoured high production, and everyone got a share of the benefits. I am not claiming that resources and communities were 'stable', but there are no published literature, government or media reports about resource crises and conflicts until the 1970s. Equity in sharing economic benefits seems to have kept competition and conflicts at a low level, a motivation for fishers to work together on the process of commonising customary fishing areas within the Lagoon.

Equitable sharing of the benefit stream provided a foundation for commonisation, and a reasonably low population density was an additional factor that helped maintain the resource base. In 1950 the total population of fishers in Chilika Lagoon was about three-and-a-half times less than it is today.[26] Fishers were able to function cohesively enough

[25] Speeches and writings of Dr Debendranath Mansingh and Chilika poems by village elders of Badakul offer understanding on the ecological history of Chilika Lagoon.

[26] Based on the overall population growth rate in Odisha as recorded by national census 2001 (www.censusindia.gov.in) and United Nations Department of Economic and Social Affairs, 2008

to form village groups that could craft and handle the rules and norms of resource use, and presumably resolve resource conflicts in ways considering they do not feature in the written or oral histories of the region.

4.3.2 Caste-defined fishing norms and use rules

Based on a number of survey and settlement reports from pre-independence India (for details see Chapter 3) and Odisha State Gazetteers, the initiation of commonisation in Chilika could be traced back to the early part of the eighteenth century. These documents suggest that fishery resources in Chilika were managed on a caste-basis. According to caste norms, the fisher castes held rights and entitlements, and were allowed to engage in fishing while the non-fisher castes were not.[27] Non-fisher castes were considered to be higher castes, and they primarily undertook farming and other non-fishing occupations, while the fisher castes continued fishing in Chilika as their primary or only livelihood occupation. Thus, the caste system facilitated the emergence of specific caste-based occupations that in turn allowed for the defining of rights and entitlements. This in itself became one of the key foundations of commonisation in Chilika Lagoon.[28]

There are a number of castes in Chilika region which are customarily known as fishers (For details see Chapter 3). Once the basic distinction between the rights of fisher and non-fisher castes was in place, the fisher castes elaborated further on the rules of inclusion and exclusion by specifying the exact nature of fishing rights and entitlements

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(www.unpopulation.org). The current estimated fisher population in Chilika is about 300 thousand, spread across 150 villages and around fourty thousand fisher households.

[27] Fishing by non-fisher higher castes was looked down by the society, as fishing was generally viewed as the occupation of lower castes.

[28] This is not an attempt to idealize the caste system. The system of castes and sub-castes in Chilika continue to be rife with many problems, specifically issues of equity including power, control and justice.

each of the four fisher castes could hold with regard to the Lagoon fisheries resources **(Table 4.2)**. Supported by caste norms, rules including social and cultural sanctions were recognized by the then local kings of Parikuda and Khallikote during pre-independence and by the State Government after independence.

Table 4.2: Fishing methods, techniques and practices by caste group in Chilika[29]

Fisher castes	**Fishing gears/methods**	**Fishing techniques**	**Location of fishing**	**Season of fishing**	**Type of catch**
Kaibartya and *Khatia*	*Jano*	Enclosure with bamboo and nets	Shallow waters in narrow channels	May – September	Bigger fish and shrimp
Kaibartya and *Khatia*	*Bahani*	Handmade cast nets and non-motorized boats	Mostly deep waters but occasionally shallow waters	October – June	Bigger fish and shrimp
Mainly by *Kaibartya* and *Khatia;* Occasionally by other fisher castes	*Dian*	Use of nets and collection by hand	Around the "Jano" fishing areas	May – September	Fish of all sizes
Kandra	*Baja, Dhaudi* and *Tataa* (Trap fishing)	Bamboo boxes of different shapes and sizes	Shallow waters and change of place seasonally	Twelve months	Shrimp and medium to small fish
Tiara	*Baja, Dhaudi, Khainchi, Mugura* and *Tataa* (Trap fishing)	Bamboo boxes of different shapes and sizes	Shallow waters and change of place seasonally	Twelve months	Shrimp and medium to small fish
Kandra and *Tiara*	*Prawn khatti*	Bamboo and net enclosures for capturing shrimp	Shallow waters	March – August	Shrimp of all sizes
Women of *Bhoi* caste (non-fisher)	*Chimuta*	Hand pick shrimps from mud under shallow water	Shallow water	March – August	Shrimp of all sizes
Men of *Bhoi*	*Suti*	Angling with	Shallow and	Mainly in	Fish of

[29] For a detail profile and description of caste groups, see **Table 3.2**

caste (non-fishers)		hook and line only	not so deep waters	summer	different sizes
	Poluha	Manually drain water from an enclosed water area to catch fish and shrimp	Shallow waters or near shore areas		Shrimp
Both fishing and non-fisher castes	*Uthapani*	Fishing in extended water areas in rainy season	Near shore and in shallow areas	July – September	Shrimp and fish of all sizes
Mainly by non-fisher castes; Occasionally by fisher castes	*Khainchi*, *Mugura* and *Khatia*	Bamboo boxes of different shapes and sizes	Shallow water and change of place seasonally	Twelve months	Shrimp and medium to small fish
	Poluha	Manually drain water from an enclosed water area to catch fish and shrimp	Shallow waters	Mainly in summer	Shrimp and medium to small fish

4.3.3 Resource rights, nested institutions and multi-level linkages

There were agreed upon management rules for Lagoon resources. What strengthened these rules was a long process of customary fishing practices that streamlined specific rights. In other words, fishing related norms, rules and practices helped to define important elements of excludability (or access-control) and subtractability (rules of conduct and sharing) with specific reference to access, use, management and membership (Ostrom and Schlager 1996). Further, not only were local resource rights established and mutually sanctioned by the caste users, these eventually found recognition by the State through legal arrangements.

A lease system was put in place (1942) before India's independence to allow the fishers exclusive rights to specific fishing areas within the Lagoon. The lease system was based on two principles which protected the interests of the customary fishers: (1) lease was offered to fisher villages only and not to individuals and (2) lease was meant for caste-based fishers only and not for non-fisher castes. Thus, clear resource rights, mutually sanctioned by caste users and recognized through legal arrangements, provided the way for the commonisation of Chilika Lagoon resources. Continued negotiation and the settlement of access and benefit rights amongst potential users was also part of this process.

The norms and rules were made operational through elaborate institutional arrangements with multi-level linkages **(Table 4.3)**. At the village level, the traditional village institutions (known as village committees) were in charge of the fishery resources, and either the village headman or a council of elders provided leadership. After 1959, village level Primary Fisherman Cooperative Society (PFCS) took over as the key community institution with regard to fisheries management in Chilika. The traditional village institutions that were responsible for the overall village management continued to provide guidance to the PFCS and monitored fishery related matters as needed. At the regional level, the Central Fisherman Cooperative Marketing Society (CFCMS), the apex organization of all the PFCS, maintained coordination between the PFCSs and worked as an umbrella organization to negotiate with government departments. The District Revenue Department used to lease out all demarcated fishing areas to the CFCMS, which in turn allocated them to village level PFCSs through an elaborate system of sub-leases. *Jati Panchayats* or caste assemblies were another prominent institutional arrangement

that facilitated commons formation in Chilika. There is a saying in Chilika that 'when nothing works the *Jati Panchayat* takes over the reins and ensures that resolution of the issue is achieved'. A later addition was the Chilika Fishers' Federation that comprised of all the fisher villages as members, and it functioned as an advocacy and pressure group. These layers of commons institutions and their linkages clarify the rich typology of institutional arrangements in Chilika Lagoon. The nested character and the multi-level linkages of these commons institutions provided a strong institutional basis for the process of commonisation in Chilika.

Table 4.3: Nested and multi-level commons institutional arrangements in Chilika and their current status

Institution	Level of organisation	Membership	Key functions	Current status
Traditional village committee	Village	All households represented by adult members	Overall village management including fishing	Exist in all villages but ineffective in dealing with current fisheries management issues
Primary Fishermen Cooperative Societies (PFCS)	Single or cluster of villages	All fishing households	All fishing related matters including fishing area leases	Exist on paper, used for annual lease but otherwise either dormant or dysfunctional
Central Fishermen Cooperative Marketing Society (CFCMS)	All fishing villages in Chilika having PFCS	All PFCS and its members	Taking area lease from revenue department and sub-lease to PFCS	Dissolved and powers were given to the FISHFED in 1988
Jati Panchayats or Caste Assemblies	Regional / national, all fishers belonging to a particular fishing caste in Chilika region and elsewhere	Fishing villages or fishers belonging to a particular fishing caste	All matters relating to the particular fishing caste, including fishing related conflicts	Exist but with weak structure and functions
Fisher Federation	Chilika Lagoon	All fisher villages in Chilika	Advocacy on fishers' issues of concern, conflict resolution and overall monitoring	Divided into five groups based on caste, location of villages and political party affiliation

4.3.4 Fishing practices, policy support and fishers' connection to the Lagoon

Traditional fishing practices of the fishers were based on the seasonal cycles of fish species, and their use was specific to particular locations within the Lagoon **(Table 4.2)**. Each caste of fishers used different fishing gears and methods to fish in different locations specified for them by customary norms. There was clear agreement on what to catch, where, in which season, by whom, and the particular fishing technique to be used. Thus the methods of fishing conformed to the entitlements of each particular caste, and reduced the chance of conflict by allocating separate methods of fishing.[30] Fishing practices helped maintain a healthy Lagoon system by focusing on seasonally abundant species. Communal fishing methods were frequently used. A number of techniques required collective action in which a group of villagers, even the entire village, had to go together for fishing; there were rules of practice and rules for sharing the catch equitably**.**

The State Government's overall policy on Chilika Lagoon management was characterized by an approach of non-interference until about the 1970s. This unwritten policy[31] stood in favour of a capture-based fishery, thereby keeping interference from non-fishers to a minimum. It was evident that existing social, cultural, political and biophysical factors helped fishers to maintain strong livelihood and cultural connections with the Lagoon. The fishers considered the Lagoon as their mother ('Maa Chilika') and

[30] A critical look at this arrangement indicates serious equity problems in the distribution of fishing areas and techniques of fishing. The powerless and the weaker groups within fisher castes got poor fishing areas and were allowed techniques that were only suitable for smaller sized fish.

[31] The unwritten policy in favour of the customary fishers was possible as the Lagoon was neither a major economic nor revenue attraction for the State government at that time, nor was it considered a key resource for export earnings. Moreover, there were no interests shown by the higher caste elites in the Lagoon thereby no significant political contestations relating to the rights, access and ownership were evident.

fishing as a 'way of life'. Secretary of the regional fisher federation Sadashiva Jena explained:

> Chilika was not only a source of income and other economic benefits for us, but it also gave the real meaning to our lives as fishers. Because we are fishers by caste and custom, it is our supreme duty to engage in fishing……..without fishing (and the Lagoon) we would be reduced to mere nothing. Chilika and us – we symbolise each others' identities.

4.4 Decommonising the Lagoon: Key Factors in the Loss of Collective Rights of Fishers

4.4.1 "Pink gold rush" in Chilika and explosive aquaculture

Since the 1970s, a steady increase in the global demand for fish and a consistent decline in the total yield from capture fishery sources have brought aquaculture development to the forefront (Delgado *et al.* 2003; Pradhan and Flaherty 2008; Marshall 2001). In the case of shrimp, growing consumer demand in North America, Europe and Japan gave rise to high international prices (Neiland *et al.* 2001; Bene 2005) thereby encouraging many countries to develop export-oriented shrimp aquaculture. The international market for shrimp and prawn developed in the 1970s; prawn in India that had little value previously now became "pink gold" (Kurien 1992). Intensive shrimp aquaculture started in the late 1970s in India and gained momentum in the mid-1980s, putting India among the leading shrimp exporting countries in the world. The total value of export earnings from shrimp in the year 2004 was US$715 million (FAO 2006), and has risen since then. Chilika Lagoon, which was a natural area for tiger shrimp (*Penaeus monodon*), caught on to the trend in the early 1980s, as investors and policy makers

found the area highly suitable for intensive shrimp aquaculture. As the international price of tiger shrimps spiralled upwards, the stakes for the non-fishers became formidable (Pattnaik 2007).

Following global market trends on international shrimp prices, a major blow to commonisation came with the explosive growth of shrimp aquaculture in the Lagoon in the 1980s. Mainly non-fishers, with the direct or indirect involvement of powerful people, started to invest in aquaculture. Driven by profit motives, they started taking over more and more of the customary fishing areas of caste-based fishers, and converted them into shrimp ponds. A culture of encroachment became prominent and towards the end of 1980s, the Lagoon was virtually taken over by non-fishers and what the fishers call the "Chingudi[32] mafia". These developments gave rise to severe conflicts between caste-based fishers and non-fishers that became a regular phenomenon in the Lagoon. One of the key issues in the decommonisation process was the failure of the State to protect the livelihoods and welfare of the fishers in the face of global changes impacting regional and local resource management regimes. Even though the decommonisation processes started with the change in global markets for shrimp, there were several other key factors, as detailed in the following sections (**Table 4.4**).

4.4.2 Fishing area allocation and changes in lease policy

Even though aquaculture was a predominant factor in the loss of collective fisher rights, the actual loss of customary fishing areas had in fact started during early 1970s with the creation of protected areas within Chilika Lagoon. It is important to note that the Odisha State Government changed its approach to the management of Chilika Lagoon

[32] *Chingudi* is *Oriya* for prawn and shrimp.

in the 1970s by declaring *Nalabana* Island (1553 ha) a wildlife sanctuary in 1974. In the British survey records of 1897 and the lease records of CFCMS / FISHFED (Odisha State Fishermen's Co-operative Federation) this particular area was mentioned as the exclusive customary fishing ground of four *Tiara* caste fisher villages in Banapur region.

Table 4.4: Key factors of the decommonisation process in Chilika

Key factors	**Manifestations**
Global market trends	International shrimp prices became a driver of change
Shrimp aquaculture	Non-fishers and other powerful people undertook aquaculture activities Customary fishing areas became shrimp ponds Conflicts between fishers and non-fishers became prominent
Creation of Protected Areas	Protected Areas superimposed on customary fishing areas effectively excluding fishers Reallocation of customary fishing areas and their diversion other uses
Change in government policy	Shift in focus from capture to culture fishery From caste-based fishery to involvement of non-fishers and industry Focus on eco-tourism in the Lagoon
Change in Government lease policy	Legalized shrimp aquaculture Non-fishers given rights for the first time undertake culture fishery Fishing areas withdrawn from customary fishers and handed over to non-fishing villages for shrimp aquaculture
Changes in lease arrangements	Unaffordable lease fees at 27 percent annual increase Seen as a strategy to displace customary fishers Unofficial sub-lease of customary fishing grounds Fishing area lease to individuals, non-fishing castes, and even government departments
Culture of encroachment	Non-fishers and "Shrimp mafia" indulged in encroaching customary fishing areas Bulk of the motivation came from shrimp aquaculture About half of the fishing area encroached
Loss of rights and entitlements	Encroachment, high lease fee and loss of institutional base resulted in serious issues of access and entitlements
Erosion of fisher institutions	Centralized agencies like Chilika Development Authority (CDA) and FISHFED replaced fishers' institution Locus of decision-making control moved from local fishers to a centralized administrative control Village level cooperatives became either dormant or dysfunctional
Change in fishing practices	Dominance of synthetic nets which replaced traditional nets Fishing became more or less individual activity
Sense of disconnect from Lagoon	Ecological, social and economic disintegration, and unsupportive political decisions initiated a process of disconnect Growing resource degradation (loss of biodiversity and fish productivity) aggravated fishers' disconnect by promoting out-migration The new sea mouth as a key driver of change

In a single stroke, their rights and entitlements were withdrawn, and the area where they had enjoyed generations of livelihood rights was declared "restricted", without any process of consultation with these villages.[33]

Later during the 1980s, the State Government also started to move away from its earlier recognition of caste-based fishery management in the Lagoon, and involved non-caste fishers and other groups, including corporations, in the fishery. In line with this approach, the State Government signed a memorandum of understanding with the Tata group, a large Indian holding company, allowing it to make investments in intensive shrimp aquaculture within Chilika. Fourteen hundred ha of customary fishing grounds belonging to nine fisher villages were handed over to Tata. However, even though project development activities had started, the company decided to pull out of the area owing to sweeping protests by fishers who were united under the banner of *Chilika Bachaoo Andolan* (Save the Chilika Movement). Nonetheless, the area remained in dispute and had not been returned to the right holder fisher villages as of 2011.[34] This incident also set a trend of more non-fishers and outsiders getting interested in shrimp aquaculture as the government's intentions in favour of aquaculture became evident.

Continuing with its support for aquaculture, the State Government introduced a new lease policy in 1991 that legalized shrimp aquaculture in Chilika and made

[33] The four villages tried to challenge the government's decision by making petitions to the Prime Minister of India. They received a reply that supported the State Government's action.

[34] Area under the project remained 'free for all' (or open-access) for a period of time before being encroached by Panasapada, a powerful non-fisher village, and put under shrimp aquaculture. Siara Gola village, the original right holders of the encroached area, continues to make petitions for the return of the fishing area both at the district and State administration levels but without any success.

provisions for non-fisher caste villages to engage in aquaculture. In accordance with the lease policy, 6000 ha of customary fishing areas were withdrawn from the caste-based fishers and reallocated to non-caste fishing villages. This loss of customary fishing areas by the fisher villages was in addition to the area already under encroachment. The lease policy was challenged in the state and the federal courts which later banned shrimp aquaculture in the Lagoon (refer to Table 3.4 in Chapter 3). The 1991 lease policy was cancelled in 2001 by the State Government. However, encroachment of customary fishing areas along with shrimp aquaculture continues in the Lagoon (further details in Chapter 3). These developments accelerated the pace of decommonisation by initiating a trend of encroachment by, and the legalization of, aquaculture.

A related development occurred due to growing confusion and conflict over fishing areas. My field notes indicate that fishers were afraid of their physical safety (i.e. threats of violence) and stopped going to their customary fishing areas that were either located close to non-fisher villages or at distances requiring travel through non-fisher villages. In addition, many fishers could not travel to their customary fishing areas as navigation became a real problem due to the intense web of shrimp farms. Eventually, these abandoned areas became *de facto* open-access, open to encroachment and eventual privatisation. One of the study villages, Badakul, has abandoned more than half of its 2000 ha of customary fishing area due to conflicts with aquaculture owners.

The allotment of fishing area had continued without any change in lease fee until 1965 when a system of 10 percent annual incremental lease fee was introduced. This provision was acceptable to the fisher villages as they had relatively high incomes at that time. Moreover, the village PFCS were able to make a profit and mostly took on the

responsibility of paying the lease fees. The ten percent annual increase in lease fee continued for a good 30 years after which the State Government modified lease arrangements in 1991 by increasing the annual lease fee by 27 percent; this amounted to a doubling of the lease fee in less than three years. The enormous lease fee was far less affordable because by the mid-1990s fish production had plunged, bringing down fishers' income levels and forcing many to out-migrate. Since the village level PFCS were out of business, the entire burden of paying the lease fees fell on the remaining fishers. However, the government chose to continue with the exorbitant fees for lease. The burden of lease fees, coupled with the loss of fish production and dwindling income levels of fishers, has become a crucial factor for the loss of fishers' control over commons in Chilika.

4.4.3 Loss of resource access rights, fisher institutions and fishing practices

High lease fees coupled with an expanding encroachment of customary fishing areas resulted in caste-based fishers losing access and entitlements. While a lease entitles full access to the resource, in practice, caste-based fishers were denied any such rights due to the invasive nature of encroachment. However, the fishers continued to pay an annual lease fee and take even the encroached areas on lease in order to retain long-term rights. Interviews with fishers in several villages revealed that even though parts of the leased fishing area were no longer under their possession, they preferred to renew the lease every year by paying high lease fees just as a strategy to retain their ownership claims in some form. Pramod Jena of Badakul village explained, "paying high lease fees is definitely an expensive way of maintaining our rights as fishers. But we fear that if the annual lease is not renewed, our customary fishing areas would be leased out to non-

fisher villages." I observed in the lease records of CFCMS/FISHFED that in several cases parts of customary fishing areas have already been leased out to outsiders either because the fisher village could not renew the lease or the payment of lease fee was delayed.

I tried to understand how fisher villages managed such large fees when fish production and their incomes were so low. I found that a common practice across fisher villages (92 percent of lease holding villages) has been to unofficially sub-lease portions of their customary fishing areas to outside moneylenders. The money obtained, in most cases, is used to pay for the fees and ongoing court cases involving conflicts over fishing areas. However, all of these sub-leased areas eventually end up being used for shrimp aquaculture. Once sub-leased, these areas remain under aquaculture, and the moneylender pays additional money every year to maintain custody of the area. I observed that in a number of cases the sub-leased areas were eventually encroached by the moneylenders when the fisher village refused to continue sub-lease after the loan money was paid back.

All such factors have contributed to the erosion of the local institutional base of commons in Chilika. With the loss of fish resources, most PFCS ran out of business and became largely non-functional. My data show that only 5% of fisher cooperatives were functional and 95% had either become dormant or non-functional. **Table 4.3** shows the current status of various local institutions, suggesting that they have gradually become ineffective. Two developments in the early 1990s were important in this regard. First, in 1991 FISHFED was created as an apex organization of all the fish cooperatives in Odisha state including Chilika region. FISHFED replaced the CFCMS, which as a Chilika level local institution, was able to function in close collaboration with village-level PFCS. In contrast, the creation of FISHFED at the state level took away the locus of decision-

making from local fishers to a centralized administrative control. Second, in 1992, a centralized autonomous agency known as the Chilika Development Authority (CDA) was created for administrative control of Chilika Lagoon. Creation of these two macro-level organizations contributed to the breakdown of nested and multi-level institutional arrangements in Chilika and undermined customary village institutions.

Caste-based fishing practices changed significantly as the diversity of traditional fishing techniques were gradually replaced by a few dominant methods using synthetic gillnets and trammel nets (locally known as *khanda jala*) thereby resulting in new kinds of conflict and competition among fishers.[35] Moreover, fishing has increasingly become an individual activity as opposed to a group activity in which a large group or the entire village fished together. The new techniques enabled fishers to fish year round, disregarding the seasonality of the Lagoon and that of its species. As resources started to dwindle and fishing areas became restricted due to encroachment, the new fishing nets led to the overexploitation of Lagoon resources through intensive fishing in the remaining area, in turn increasing competition and conflict.

4.4.4 Resource degradation and fishers' disconnection with the Lagoon

Ecological degradation and deterioration in the condition of the Lagoon resources also contributed to decommonisation. Three major factors contributed to these changes. First, the blockage of the natural Lagoon opening to the sea created problems because of the flow of sediments from rivers and their discharge to the Bay of Bengal, causing increased siltation in the Lagoon. Second, large-scale shrimp aquaculture and the

[35] Experienced fishers recollect that changes in fishing practices were mainly influenced by shrimp aquaculture, especially the use of synthetic (nylon) nets which were introduced by aquaculturalists.

encroachment of customary fishing grounds exacerbated this problem. Third, the artificial opening of a new "sea mouth"[36] by the State Government in 2001 resulted in dramatic changes in the Lagoon ecosystem. As a result, Chilika Lagoon began to lose its biodiversity and resources started to dwindle (Ayyappan and Jena 2000). Productivity levels declined, eventually bringing down income levels of fisher households to an all time low. Ninety-four year old Hariahar Jena of Badakul village exclaims:

> When I was young I was able to catch fish just by using my *gamucha* (a short piece of cloth locally used as a towel) in the Lagoon. I could bring that fish home even quicker than my wife was able to cook rice...that's what we ate most of the days. Now I see my sons return from Chilika empty-handed day after day. Their fifty yards long fishing net must be thirsty for a fish. I hope mother Chilika is not dead already.

My survey in two fisher villages supported Harihar's concerns: between 2002 and 2008, the average annual income of fisher households dropped by seventy to eighty percent. In 2002, fishing was the primary or only occupation; by 2008, 92 percent of the fisher households had taken up other occupations as their primary source of income. Forty percent of households either abandoned fishing or engaged in seasonal fishing only; more than 90 percent of the households took loans averaging around US$1500. What followed thereafter was large-scale out-migration by fishers as wage labourers. My survey showed that 53 percent of households in Berhampur and 31 percent of households in Badakul had male members still on migration; the Chilika average for out-migration numbers stood at 33 percentage.

[36] Even though there were several other drivers of ecological degradation in Chilika, local fishers view the new sea mouth as the most important driver of social-ecological changes in the recent years (Nayak and Berkes 2010).

Out-migration has created a good number of 'absent fishers', a situation averse to the notion that a process of collective action requires physical presence of the users and their day-to-day involvement in fishing. Thus, economic and ecological displacement has further contributed to the decommonisation of Lagoon resources. Social, economic and ecological disintegration and unfavorable political decisions have disrupted fishers' customary way of life. Disengagement of fishers from fishing initiated a process of disconnect between the fishers and the Lagoon which soon became an additional factor in decommonisation.

4.5 Commons Continuum and Drivers at Multiple Levels

The management of fishery commons in Chilika Lagoon have been subject to several influences that cut across political, economic and ecological boundaries at multiple scales. Chilika commons have been dynamic over time, consistent with the literature that suggests that commons institutions may go through processes of development and decline (Atapattu 1987; Seixas and Berkes 2003). The dynamic nature and fluctuations associated with commons development make it imperative to understand commons as a process, rather than a regime fixed in space and time. The Chilika case suggests that a set of demographic, social-cultural, political and bio-physical factors are the key determinants of both the processes of commonisation and decommonisation (Figure 1). The same set of factors supported commonisation or decommonisation depending on the "sign" (positive or negative; higher or lower) of the variable. **Figure 4.1** also posits that drivers at multiple levels had influence over both the commonisation and decommonisation of fishery resources in Chilika.

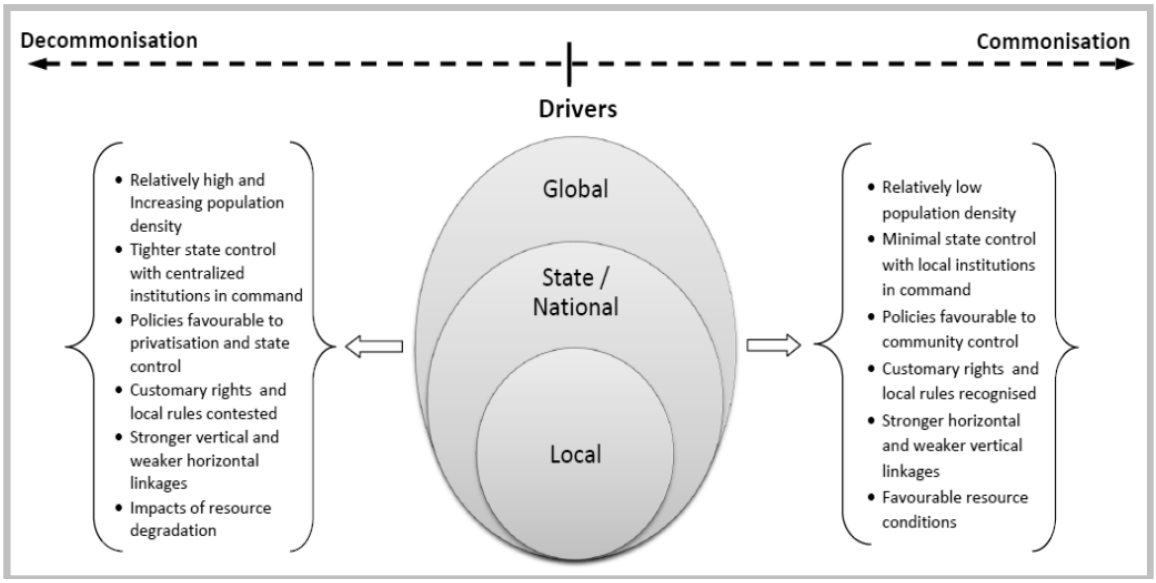

Figure 4.1: Drivers at multiple levels and factors that influence commonisation and decommonisation in Chilika

For property rights to exist, three elements are needed: the resource (over which claims are being made for a benefit stream), the claimants (in this case the fisher castes), and the others (in this case the rest of society around the Lagoon and the state). Property rights are primarily about relationships among people and secondarily about control over the resource (Ostrom 2009). **Figure 4.1** shows continuum and reversibility because variations in the same set of drivers and factors can potentially influence either commonisation or decommonisation. It was evident that existing commons faced the constant challenge of being decommonised, despite the considerable effort by fishers to keep the process of commonisation active. For example, when the encroachment of customary fishing areas drove the process of decommonisation, payment of high lease fees by the fishers, even without access to the encroached fishing areas, kept the prospects for commonisation alive. Thus, the processes of commonisation and decommonisation may be seen to be continuous, concurrent and potentially two-way.

Changes in government policies had cascading effects on the management and use of the Chilika Lagoon commons. The previous policy of minimal or no interference from the government was replaced with tighter state controls. Many notable changes were listed: establishment of *Nalabana* Bird Sanctuary by abolishing customary rights; promotion of aquaculture by transfer of customary fishing grounds to non-caste fishers and companies; legalisation of shrimp aquaculture by undermining customary fishing practices based on the capture fishery; and changes in lease policies, making it expensive and cumbersome for poor fishers to retain rights.

Thus, a series of changes in the State Government policies permitted decommonisation, changed the composition of the dominant user-groups and caused the partial elimination of the capture fishery. Even though most of these changes occurred at the local, regional and the state levels, they were largely influenced by higher level drivers. The basic drivers in the case of Chilika were the global seafood markets and the high price for tiger prawn that swayed State Government policies in favour of decommonisation. State politics and regional (Chilika) level politics also contributed to the process of decommonisation. Participants at a state level policy meeting in 2008 noted that

> It is hard to imagine a situation where more than half of the 1200 sq km Lagoon area would move into the hands of illegal aqua-culturists without the knowledge of the State Government and its local bureaucracy. It is beyond doubt that shrimp aquaculture in Chilika was primarily undertaken by non-fishers and it hinged on the unofficial support of the State bureaucracy, political representatives and

"people in power" (Declaration of Chilika Research Workshop, Bhubaneswar, September 2008).

The interests of higher caste non-fishers in aquaculture clashed with the primary stake of caste-based fishers, resulting in caste conflict. Later, the caste-based fishers got divided into smaller groups based on their specific caste and geographic location. This gave rise to intense caste politics and conflicts involving both the higher caste non-fishers and caste-based fishers, and among caste-based fishers themselves. Even though they have adverse impacts conflict may act as a key to the resolution of excludability and subtractability questions. Conflict is not always seen as a negative force as it allows fishers to bring differences to the table, discuss them, negotiate and resolve many of them, if not all. Therefore, conflicts may not make the idea of recommonisation less credible (discussed in the concluding section of this chapter) but help in resolving these issues related to excludability and subtractability in the attempt towards recommonisation.

For the powerful "prawn mafia" and everyone with an interest in aquaculture, this offered ideal conditions for a strategy of "divide and conquer". The "divide and conquer" strategy refers to several attempts made by the "prawn mafia", including local political leaders, traders and middlemen, to break the unity among fisher castes with regard to their opposition to aquaculture. This involved, among other things, a disinformation campaign to create rifts between the fishers based on their geographical locations, political and caste affiliations. For example, fishers on the northern end of the Lagoon (who live about 100 km away from the sea mouth) were told that the fish from the sea and the outer channel area near the sea mouth were not able to reach them because of

overfishing by the fisher villages that are strategically located near the mouth. The protests by these fisher villages to close down the new sea mouth was depicted as counterproductive to fish production in the northern and southern parts of the lagoon. In addition, the political party affiliations of the fisher villages were manipulated to create divisions among them. Needless to say, the existing caste divisions within the fisher castes (refer to section 3.4.1 in Chapter 3 and Table 4.2 in Chapter 4) were also used to instigate fisher villages against each other. Consequently, the Fisher Federation, once a symbol of fishers' unity, got divided into six factions based on caste, geographical location of fisher villages, and political affiliations, among other things (refer Figure 6.1 in Chapter 6). Such disinformation also caused a division amongst the fishers with regard to their position on important issues like aquaculture and the sea mouth.

At the institutional level, the creation of CDA and FISHFED as two apex level bureaucratic organisations toppled the diversity of institutional structures and their horizontal linkages. As village fish cooperatives became defunct and traditional village committees took a back seat, day to day initiatives around local-level institutional innovations stopped. Higher level institutions like CDA and FISHFED became inaccessible to fishers and the locus of decision-making soon moved out of the village and beyond regional boundaries. Thus, changes in the local institutional arrangements and the establishment of higher level organizations were effective in either suppressing or replacing traditional fisheries institutions and dismantling the commons in Chilika.

From the point of customary fishers, with one-third of the adult population already on migration, they are perhaps fighting a losing battle in Chilika. Aquaculture proponents are finding new ways to continue despite court orders and legislative

proclamations. In fact, there is growing political party affiliations among aquaculture owners and a lot of shrimp money continues to flow to political party leaders and their campaigns. The nexus between aquaculture owners and the "people in power" has proved detrimental to the process of commonisation and highly supportive of decommonisation.

Chilika is a clear case in which government policies have encouraged *de facto* privatisation, consistent with findings elsewhere that aquaculture facilitates the elite takeover of previous commons (Beck and Nesmith 2001). In this case, the mechanism or the pathway has been: commons – decommonisation – open-access – privatisation. Open-access fits in as a transitional phase in which commons rules no longer apply but neither is there a set of consistent new rules. It is a "free for all" situation whereby the powerful players are always at an advantage. In both the transfer of customary fishing areas to Tata (1400 ha) and to non-fishers (6000 ha), fishing areas were never returned to the original users even though both the allotments were officially cancelled. In the case of the Tata project, fishing areas remained under open-access for several months before being encroached and privatised for aquaculture by the powerful higher caste villages. The 6000 ha transferred under the 1991 policy was promptly encroached and privatised, and it continues to be under the possession of non-fisher villages even after the policy was revoked in 2001. Thus, decommonisation has pushed fishery commons in Chilika into a state of "elite capture" (Bene 2003).

4.6 Turbulence in the Commons: Where are the Commons Going?

In Chilika, the lease system strengthened fishers' rights and entitlements and recognised their fishing rules and customary use. Fishers were able to create permanent

stakes in specific fishing locations and also strengthen their claims over those areas through continuous lease. To put things in perspective, fishers' rights to access and withdraw resources were defined through the lease system, with *de facto* rights to manage, exclude and alienate, providing a "bundle of rights" (Ostrom and Schlager 1996) under the process of commonisation. However, with the start of the decommonisation, there was disintegration in the bundle of commons rights, leading to a peculiar property rights situation. While the fishers continued to pay the lease price to remain entitled to the bundle of rights, none of the rights in the bundle were actually available to them. Therefore, the postulation by Ostrom and Schlager (1996) that "collectives may, and frequently do, hold well-defined property rights that do not include the full set of rights listed in the bundle; but to hold some of these rights implies the possession of others," does not necessarily clarify the emerging property rights situation in Chilika.

Two major trends emerge from this analysis: (1) as of 2010, caste-based fishers of Chilika do not hold a single right from the 'bundle', an indication that they have moved from being legal rights-holders to a state of dispossession, (2) non-fishers have moved from a state of no or "thin" access to being claimants, in effect, of full rights. The second trend supports the theory of access (Ribot and Peluso 2003) which maintains that access has the potential to eventually lead to the establishment of property rights. However, my analysis goes further to indicate that while access can lead to property rights as observed in the case of non-fishers, legally confirmed property rights and entitlements can also regress to either a "thin" or no access state, an outcome actually suffered by caste-based fishers. Together, these trends suggest that commons is not a fixed property type; rather, commonisation/decommonisation can be better understood as a process with multiple

possibilities. In the case of Chilika Lagoon, continuous changes in fishers' access and entitlements formed the crux of these two processes. The Chilika case may characterise commons dynamics in other cases faced with similar challenges among resource dependent communities across the globe as they strive to live with their commons.

The question of how a regime of customary rights of caste-based fishers gradually changed into a state of *de facto* control of non-fishers in Chilika Lagoon offers complex challenges. I consider that a bundle of commons rights, even when they appear to be *de jure* rights, is perhaps not enough without a "bundle of powers" (Ribot and Peluso 2003). Effective commonisation would imply locating these *powers* within the social, political, economic and ecological contexts that shape people's ability to benefit from resources. Moreover, understanding the processes of commonisation and decommonisation requires among others, attention to co-optation (Nayak and Berkes 2008), mechanisms by which the state may seek to expand its power "in new ways" (Lele 2000). This was evident in Chilika as the State gradually moved from its role of allocating fishing rights and entitlements to regaining control of the Lagoon through attempts such as introducing its 1991 aquaculture policies. In contrast, an active process of devolution should facilitate commonisation. But the state is by nature interested in maintaining control and accumulating power (Lele 2000; Winslow 2002), and therefore co-optation possibilities always remains high (Nayak and Berkes 2008).

The whole of Chilika Lagoon is *de jure* state property, it is "owned" by the State of Odisha. The state disburses fishing rights to the fisher villages through annual lease and this has been happening for decades. Once the fisher village gets lease, commons management can begin, i.e. the area is allotted to fisher households and the village fishery

institution applies and enforces its own rules. However, with the advent of aquaculture a lot of the village fishing areas (commons) have been encroached and put under private use (i.e. private or privatised property). Interestingly, these encroached areas are still taken by the fisher villages on annual lease, even without any physical access to these areas. The fisher villages continue to take lease by paying the annual fees in order to retain their legal rights and use the lease papers as a proof for future claims. Thus, a complex mix of property rights exists whereby fishers have *de jure* rights (through lease) to their commons which is a *de facto* private property (through encroachment) even though ultimately the ownership rests with the state (a state property).

The complex nature of resource management in Chilika is a result of the diversification of *de facto* commons into various property rights. The factors, processes and the social-ecological and political circumstances which influenced this diversification are crucial. I observed that specific areas within the Lagoon remained simultaneously under two or more property rights regimes. Many areas that were managed as commons by caste-based fishers were in effect privatized through encroachment by non-fishers. While fishers continued to lease these encroached grounds, they had virtually lost their access to them. Consequently, these areas remained under an unstable mix of commons and private property. At the same time, the government retained its ownership over all these areas, which made them state property.

It is evident that the diversification of property types in Chilika has given way to the establishment of multiple or mixed property rights regimes **(Table 4.5)**. These various regimes are often in conflict with each other, with one type hindering the functioning of the other. The changing nature of property rights and the emergence of mixed property

regimes offer interesting theoretical and practical challenges for understanding commons dynamics, and perhaps more importantly "how to keep commons as commons in the long run."

Table 4.5: Mix of property rights regime in Chilika

Property rights category	Type of resources included
State property	• Protected Areas: Nalabana Bird Sanctuary • Regulated area for dolphins • Seasonally protected areas for fish breeding • Areas for tourism • Ramsar site
De facto private property	• Encroached fishing areas under shrimp aquaculture • Encroached areas already converted to other land use or construction
Village fishing commons	• Caste-based management of some traditional fishing areas
Open access	• Abandoned traditional fishing grounds • Lagoon areas under conflict • Some deeper parts of Lagoon

4.7 Keeping the Commons as Commons!

The success of commonisation as a process depends on the close links between people and resources, not so much for economic dependence but for a more inherent and holistic relationship which find expression in phrases such as "Maa Chilika" and fishing as a way of life. The fact that several fishers thought that their relationship with the Lagoon had deteriorated over the years and they were slowly getting disconnected from it was an indication of decommonisation. Commons is not about resources and income alone; it is about relationships. It is an intertwining of humans and resources that makes commons an integrated social-ecological system (Berkes and Folke 1998). Hence, in the context of commons such as Chilika Lagoon, there is a need to deal with people and resources together, rather than each in isolation. This is a key determinant of successful

commonisation; the disconnection of people from their resources is thus a major driver leading to decommonisation.

Commonisation depends on the condition of the resource, as without a resource base one is unable to talk about a use rights regime. In resource-dependent societies, institutions and social regulations evolve in tandem with ecological changes (Nayak 2003). Commonisation, therefore, underscores the importance of resource sustainability upon which access and entitlement questions rest. My analysis supports the idea that social-ecological systems have powerful reciprocal feedbacks (Gunderson and Hollings 2002; Berkes *et al.* 2003), require institutional diversity (Ostrom 2005a), and multiple institutional linkages (Nayak and Berkes 2008). Institutional diversities are integral to the management of complex commons where new institutions can be "crafted" from elements of existing institutions; they can also arise spontaneously (Ostrom 2005a). All of these contribute to a process of commonisation.

In the context of heterogeneous societies and marginalised populations, the question of how commons outcomes influence social and political structures – issues of representation, accountability and transparency - are important considerations. In commonisation, collective action and the devolution of authority may not automatically result in social, economic and environmental justice and democratic decision-making (Bene *et al.* 2009). In dynamic situations, such as that in Chilika Lagoon, it is possible that devolution can actually create forms of "decentralized despotism" (Ribot 2000). Until the questions of "whose rights and entitlements", "who has power and control", "who takes the decisions" are dealt with, the prospect of justice in the commons will remain a moot question (Zerner 2000).

Commonisation involves the transformation of resources from one property type to another, a process that is strongly influenced by the prevailing policy and governance structures. In Chilika, the Government initiated changes such as the lease policy with a revenue orientation, primacy to aquaculture, and a redefinition of access rights that ignored long-established rights of caste-based fishers. Appropriate governance structures and adequate policy support can create conditions for ordered rule and collective action (Stoker 1998) and promote institutions of social coordination (Lee 2003). A process of commonisation can benefit from the devolution of management rights and power sharing (Folke *et al.* 2005), creating space for participation, representation, accountability, empowerment and social justice (Lebel *et al.* 2006), formulation and application of principles to guide interactions (Kooiman and Bavinck 2005), and respect for diversity, complexity, power dynamics and cross-level linkages (Nayak and Berkes 2008). If facilitated by appropriate governance and policy regimes, these factors can become key attributes of a recommonisation process to retain the Chilika commons as commons.

Commons are multi-level, and drivers at various levels of organization impact on decision-making (Berkes 2007a). Different actors can constrain, create, and shift scales to serve their own interests (Cash *et al.* 2006). Commonisation and decommonisation in Chilika had far reaching influences from drivers at multiple levels, such as global shrimp markets, state and national policies, and local and regional caste and class politics. Various actors at different spatial scales were able to alter fisher access to commons. Thus, the long-term management of Chilika commons will need to involve institutions at multiple levels (Young 2002; Adger 2003) and to craft new institutional arrangements (Ostrom 2005a). Currently, a confusing mix of property rights regimes exist in the area.

However, to keep Chilika commons as a commons or to maintain the sustainability of Chilika SES will require, as a starting point, a policy environment in which legal rights and customary livelihoods are respected.

The timing may be good for a policy change: international shrimp markets have stabilized and the "pink gold rush" is over. Under new policies, a political space for negotiation needs to be created, and processes that cause marginalisation reversed. In addition, more diverse and viable opportunities for employment and income would be effective in the process of renewal of connections with the environment. Fishers need to be empowered to re-connect to their environment and re-invent traditions of stewardship without which there will be no resources left to fight over. Networks and partnerships are central to this process of capacity-building and social-ecological revitalisation. These changes, or transitions, are analysed in the next chapter, in the context of livelihoods.

Fishers showing empty nets and bags during a series of photo documentation in Berhampur village
Photo: Prateep Nayak

CHAPTER 5

FISHER COMMUNITIES IN TRANSITION: UNDERSTANDING CHANGE FROM A LIVELIHOOD PERSPECTIVE[37]

5.1 Introduction

Chapter five explores an understanding of social-ecological change in Chilika from a livelihood perspective. It describes how through changes in context, resources and institutions, fishers in Chilika dealt with the livelihood crisis, and how various strategies were used. It further discusses that the outcomes did not necessarily lead to making their livelihoods sustainable. Rather, the resulting trends, including out-migration and migrant work, resulted in higher levels of fisher disconnection from the Lagoon and greater marginalization.

This chapter begins with: 1) a framework for analysing livelihoods with regard to changes in the resources, institutions and context (political, social and economic); and 2) a brief overview of the crisis in Chilika. Following this, the chapter focuses on various strategies used by fisher households to deal with the livelihood crisis, and attempts to make an analysis of their outcomes. Particular attention is given to the implications of livelihood outcomes for fishers' disconnection and marginalisation. Finally, the current

[37] Parts of this chapter, plus content from some of the previous chapters, have been published as: Nayak, P. K. and F. Berkes. 2010. Whose marginalisation? Politics around environmental injustices in India's Chilika Lagoon. *Local Environment* 15 (6): 553–567.
Robson, J. P. and P. K. Nayak. 2010. Rural out-migration and resource dependent communities: Lessons from Mexico and India. *Population and Environment* 32: 263-284.

context of livelihood is considered in regard to future transformations in the livelihoods of Chilika fishers.

The analysis in this chapter draws extensively from primary data collected through a variety of surveys: 1) a household survey in two selected fisher villages – Berhampur and Badakul, 2) monthly livelihood monitoring in selected households from the two study villages, and 3) general survey results from 140 fisher villages. This was corroborated with information collected through consultations and interviews with multiple stakeholders and also by accessing existing data sources, including both village records and policy documents. Chapter two provided a more detailed description of the various research methods and sources of data as they were used for understanding livelihood perspectives in Chilika.

5.2 Framework for Analysing Livelihood

The sustainable livelihood framework has remained a useful approach to analyze changes in rural livelihoods, especially in resource dependent communities. The framework states: "Given a particular ***context*** (of policy setting, politics, history, agro-ecology and socio-economic conditions), what combination of ***livelihood resources*** (different types of 'capital') result in the ability to follow what combination of ***livelihood strategies*** (agricultural intensification/extensification, livelihood diversification and migration) with what ***outcomes***? Of particular interest to this framework are the ***institutional processes*** (embedded in a matrix of formal and informal institutions and organisations) which mediate the ability to carry out such strategies and achieve (or not) such outcomes (Scoones 1998:3)".

The sustainable livelihood framework is based on five interacting factors: context, resources, institutions, strategies and outcomes (**Figure 5.1**). The framework emphasizes that given a certain situation where the livelihood context, resources and institutions remain favourable, the livelihood strategies carried out by people could lead to sustainable outcomes. While this may be true in many locations across different resource types, the sustainable nature of livelihood outcomes have remained questionable because of the complexities associated with their definitions.

Chambers and Conway (1992:6) suggested that "a livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities, assets and entitlements, while not undermining the natural resource base." Allison and Horemans (2006:759) state that "a livelihood is sustainable if people are able to maintain or improve their standard of living related to well-being and income or other human development goals, reduce their vulnerability to external shocks and trends, and ensure their activities are compatible with maintaining the natural resource base", which in this case is the fish stock. These two definitions of a sustainable livelihood are important but also limited to the extent that they sound prescriptive. Absent are any clear ideas on how livelihoods "can cope with and recover from stresses and shocks" (Marschke and Berkes 2006:1) within the given conditions outlined in the definitions. However, these definitions certainly warn us as to 1) the nature and extent of complexity involved in achieving sustainable livelihoods and 2) the possibility that livelihood strategies, influenced by changes in context, resources and institutions, may rarely result in sustainable livelihoods.

This chapter uses a sustainable livelihood framework to further probe these challenging issues. **Figure 5.1** considers that large-scale changes in the livelihood context, resources and institutions in Chilika Lagoon adversely impacted fishers' livelihood. This prompted the fishers to formulate various livelihood strategies that can be categorized under coping for subsistence, intensification, extensification, diversification and migration. However, contrary to the suggested positive outcomes of sustainable livelihood framework, the outcomes were far from being sustainable; fishers in Chilika experienced quite a significant level of disconnection with the Lagoon resources that intensified the process of their marginalization.

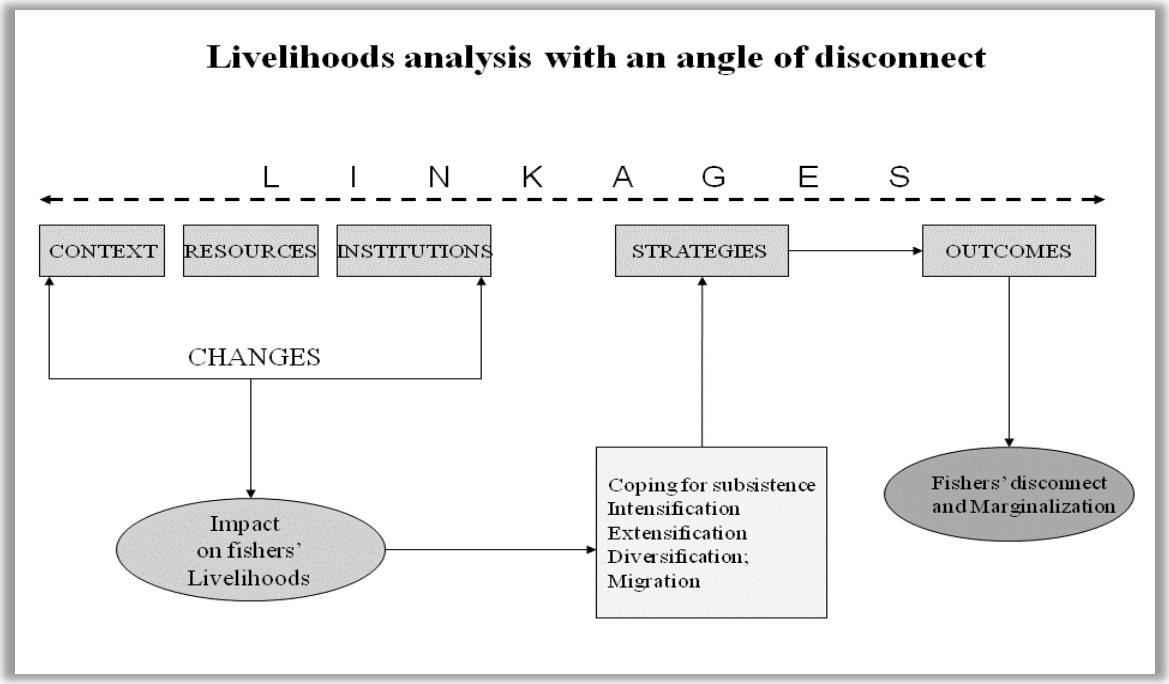

Figure 5.1: Sustainable livelihood framework: Examining the strategies and outcomes (Modified from Scoones 1998; Bebbington 1999)

5.3 Staying Alive: Current Livelihood Crisis in Chilika

The four metaphors in Chapter 1, also with the explanations based on those metaphors, are highly relevant for understanding the current livelihood status of fishers in Chilika (**Table 5.1**). Chapter 2 also gives some details about the profile of the study villages and the nature of the crisis in the Lagoon area.

Table 5.1: Fishers' metaphors and current livelihood crisis in Chilika

Fishers' Metaphors (from Chapter 1)	Livelihood implications
"Chilika was our "bhata handi" [rice pot], and our local bank [fish as cash]"	Food insecurity and economic deprivations as indicators of worsening livelihood situations
"Mother Chilika is crying"	Loss of ecosystem health resulting in social, economic, and political deprivation, all of which impaired fishers' ability to manage livelihood
"What do we do when the Brahmins and the Karans like fishing"	Growing power imbalances, political and caste dynamics and alterations in resource access and institutional regimes as factors for livelihood loss
"For the poor, when hunger becomes unbearable, movement becomes our last resort"	Struggles and movements are the ultimate action for the fishers when livelihood conditions have become rampant

Several drivers have contributed to the process of livelihood loss for fishers in Chilika. However, two causes stand out as major drivers of changes in livelihood. Those are aquaculture and new sea mouth. These two drivers had differential impacts on the social-political, economic, and ecological aspects of fishers' lives. While aquaculture directly influenced access rights and commons institutions (**details in Chapter 4**), the new sea mouth inadvertently impacted the species composition and productivity of the Lagoon, and therefore fisher livelihoods (**details in Chapter 3**). The two drivers acted synergistically, the sea mouth impact amplifying fisher livelihood disruption due to aquaculture expansion, and the two together resulted in the loss of livelihoods as a major outcome. However, several other factors contributed to the livelihood crisis. These

included overfishing through intensification and extensification strategies and acted as important drivers in terms of a livelihood crisis (discussed in detail under section 5.4.2). Such a link between overfishing and fishing related livelihood strategies (mainly intensification and expansion) has been shown elsewhere by Neis and Kean (2003).

Societies often adapt to change, but in the present case, the speed of change overwhelmed local peoples' ability to respond, and there were far-reaching impacts on the livelihoods of fishers. The livelihood crisis has led to the displacement (as of 2009) of about one-third of the fisher population. About one-half of the former fishers and their wives have become local wage labourers, and the other half has migrated out of the region. The details of these changes are discussed in this chapter.

5.4 Fishers' Approach to Livelihood Crisis in Chilika

Once a livelihood crisis occurred the fishers took up several strategies to deal with it. A set of five strategies and their sub-strategies were recorded in the case of Chilika: (1) coping for subsistence, (2) intensification, (3) extensification, (4) diversification and (5) out-migration. I discuss each of the livelihood strategies with their sub-strategies in the following section. Some of these livelihood strategies have been used before in Chilika, such as taking loans, mortgage and purchase on credit from village shop. Some strategies are completely new (e.g. migration from Berhampur and others under intensification and expansion). For some of the previously used strategies, their intensity and frequency have increased during the crisis. The primary source for this information is the household survey questionnaire (section 2 on occupation and income, section 4 on out-migration), individual interviews and focus group meetings. The sequence in which fishers'

livelihood strategies are discussed in the following section follows the actual order by which the fishers took up different strategies in both study villages.

5.4.1 Coping strategies for subsistence

> It is difficult to go fishing on an empty stomach. Only when I have arranged firewood for the *chullaha* (wooden stove) and rice for the pots to cook food, hunger of my family will calm down and I will have the peace of mind to go fishing. In a situation where we lack daily supplies to cook food, I do whatever options are readily available. Who has the time to think about the future?
>
> ["*Petare dana padile sina macha maribu. Chuli ku katha and handi ku Chäula jogyila pare jaee paribarara bhoka mentiba and mu santi re macha maribaku jayee paribi. Epari paristhiti re hatapahantare jaha padila taku adori tapare bhabisyata katha chinta karibi*"] Abhimanyu Jena, Fisher, Berhampur village, July 2007.

Abhimanyu's statement clarifies that for poor households a livelihood crisis often impacts the existing support system for subsistence. Consider that 100% of households in both the study villages said they preferred to make arrangements to address immediate subsistence needs on a priority basis before any long term strategy was even considered. This would ensure some level of basic livelihood security in maintaining access to food, health care, education for children and social relationships. As **Table 5.2** illustrates, most of these subsistence strategies were relatively easy to access and doable; however not without long-term implications. The following section tries to tease out some of these nuances: how a number of households fell into a vicious debt trap and the resulting financial uncertainties.

Table 5.2: Coping strategies for livelihood subsistence

Sub-strategy	Activity
Take loans and credit	• Consumption loans from multiple sources • Cash advance from fish trader • Credit from village grocery store
Mortgage and sell assets	• Mortgage and sell of household items • Mortgage or sell fishing equipments, including boats
Change in food habits	• Low quality and quantity of food
Discontinue children's education	• Some sent elder children to work
Rearrange personal and professional relationships	• Break away from joint family • Send elder children to live with relatives in other villages • Change fish trader or take a second or third trader • Discontinue participation in Fisher Federation and NGO activities including rallies and movements

Accessing financial capital had a significant role in determining how a household could deal effectively with some of the initial challenges posed by livelihood crisis. It was also a factor for preparing the household to undertake more long-term strategies to move from coping to other livelihood strategies. In their pursuit of immediate coping strategies, fisher households in Chilika mostly went after accessing available financial capital in the form of loans, advances and credits. Abhimanyu Jena of Berhampur went to the money lender for small cash loans on each of those days when he failed to get a marketable catch. With a falling catch size he now does this for more than ten days a month. Abhimanyu considers cash loans as critical to ensure a supply of food to his family, whilst trying out other options for a more reliable income. Considering that 97% of households in Berhampur and 98% of households in Badakul said they experienced regular food shortage, and most households (100% in Berhampur and 98% in Badakul) said they depended on cash loans as a coping strategy, it is hardly surprising that most other households in both villages do what Abhimanyu has opted to **(Table 5.3)**.

Table 5.3: Status of households in terms of indebtedness

Percentage of HH	Berhampur (in %)	Badakul (in %)
Experienced food shortage	97	98
Depended on cash loans	100	98
Held cash loans between 50 – 200 K (INR)[38]	67	55
Held cash loans between 200 – 500 K (INR)	15	9
Paid interest at 36% - 60% per annum[39]	90	92
Paid interest at 120% per annum	10	8
With outstanding loans	100	98
With outstanding loans exceeding 50 K (INR)	79	62

Table 5.3 shows that households in both the villages took staggering amounts of cash loans in the recent years. A majority of the households (67% in Berhampur and 55% in Badakul) have taken loans that range from 50 to 200 thousand INR over a duration of about five years. Another 15% in Berhampur and 9% in Badakul have even gone up to 500 thousand INR during the same period. The contrast between these figures on loan amounts and the total household incomes (85% households in Berhampur and 62% households in Badakul earned less than INR 15,000 during 2007 - 2008) indicates that a majority of fishing households in both villages have taken loans several times higher than what they actually earn. In other words, the ratio between household income and the amount of loan is a total mismatch. This also points towards the inability of households to repay cash loans leading to the accumulation of higher loan amounts and pressure of higher interest payments within a short period of time.

What makes repayment and the clearing of loans nearly impossible is the rate of interest and the purpose for which loans are taken. Available data suggest that 90% of households in Berhampur and 92% of households in Badakul have agreed to pay an

[38] 1 USD = 42 INR (2007-2009 exchange rates)

[39] The interest rates cited here indicates the rate of interests fishers were paying at the time of field study during 2007 – 2009.

interest rate ranging from 36 – 60 percent per annum. A smaller number of households even pay an interest rate as high as 120 percent per annum **(Table 5.3)**. "I find it difficult to even repay five percent of the annual interest on my loan amount every year. The principal amount is turning into a nightmare for me", said Hadu Behera of Badakul village. What adds to this nightmare is the purpose for which most fisher households have taken loans. **Table 5.4** suggests that a substantial part of the total loan is for consumption or/and other unproductive purposes. Loans for productive purposes like buying fishing gears and boats do not yield much return due to low fish production and the frequent loss of fishing gear to theft and natural calamity.

Table 5.4: Purpose for which fishers have taken loans

Purpose for loan	Berhampur (in %)	Badakul (%)
Food for HH consumption	95	50
Health / Hospitalization	43	44
Cultural ceremonies	64	17
Repay existing loans	55	47
Buy fishing equipment	80	35
House repairs	10	4
Marriage	54	17
Ceremony associated with death	31	17
Repay fish trader's advance	4	13
Children's education	56	19
Buy / repair boats	33	15
Other purposes	13	25

Note: Questions allowed for multiple responses

Chapala Behera of Badakul observed, "The majority of these loans are from local areas (informal sources) that have an interest in perpetuating the cycle of debt; allows us an easy entry but hardly a way to come out of it. Taking loan means getting into a *chakravieu* (vicious cycle). **Table 5.3** offers evidence to support Chapala's statement: of those who took loans, 100% of households in Berhampur and 98% of households in

Badakul have current outstanding loans; 79% of them in Berhampur and 62% in Badakul have outstanding loans exceeding 50 thousand INR.

Another form of loan are interest-free cash advances from the fish traders to whom each fisher household is attached. Households get into verbal agreements with fish traders in lieu of a bulk amount as cash advance and remain committed to sell their everyday catch to the same trader. While the advance money stays with the fisher household as long as they sell fish to the trader, the fishers are also allowed to request more cash advances at times of crisis. Consequently, 100% of households in Berhampur and 76% of households in Badakul reported that they held cash advances from fish traders, and that they had taken new advances in the recent years, especially after the livelihood crisis emerged. Though it is interest-free, there are often strings attached to these advances, and these are discussed further in the subsequent section on livelihood outcomes.

Once faced with a livelihood crisis, many fisher households have either: 1) increased their number of fish traders up to three; 2) changed their existing fish traders; 3) taken new advances from their existing fish traders; or, 4) tried a combination of the three as coping strategies. First, those who have two or three traders did it by taking separate traders for father and sons within the same household. This meant that both the father and his son got separate advances from the fish traders which helped to meet the financial needs of the household. I learnt that most fisher households used this as a strategy to have more interest free advances instead of taking high interest-based loans. A number of households have also linked up with crab traders, in addition to their existing

fish traders, because they have started crab fishing to promote an alternative source of income due to the decrease in fish and shrimp. This gets them additional cash advances.

Second, those who changed traders did so mainly because they were not able to maintain a steady supply of fish and shrimp to the trader due to falling production levels. At the same time, it was not possible for the fisher households to return the cash advance to the fish trader. Most households received notice from fish traders to return their interest free advances or face confiscation of their fishing equipment, including boats and motor engines. In such situations many fisher households took up new fish traders and got fresh cash advances; part of the cash advance was used to repay advances from the previous fish trader and the rest of it came in handy during crisis situations for other household expenses. Third, a good number of households, those with more male fishers and/or with household members able to send remittances from out-migration, were able to combine all three strategies with regard to advances from fish traders.

Even though loans and advances constitute a significant basis of cash flow to the fisher households, they also engage in other crisis management strategies when faced with livelihood related uncertainties. **Table 5.5** illustrates that fishing households have mortgaged personal assets (36% in Berhampur and 45% in Badakul), sold fishing boats (27% in Berhampur and 14% in Badakul) and sold other personal possessions including fishing gear (98% in Berhampur and 71% in Badakul) as an immediate coping strategy. In addition, buying food on credit from the village stores is practised by 88% of households in Berhampur and 87% of households in Badakul. A number of households in both study villages explained that they preferred to pay back the credit at the village

stores on a priority basis because of their continuous dependence on these stores for everyday food stuffs.

Table 5.5: Status of households regarding credit and mortgage

Percentage of HH	Berhampur	Badakul
Took cash advance from fish trader	100	76
Mortgaged personal assets	36	45
Sold fishing boats	27	14
Sold fishing gears and other possessions	98	71
Bought grocery on credit from village shop	88	87

Livelihood crisis has important impacts on the consumption levels of households (See **Table 5.3** for food shortages and **Table 5.4** for consumption loans). Consequently, compromise on the quality and quantity of food came up as an immediate coping strategy that was adopted by a majority of fisher households in both villages. About 70% of households in Berhampur and 76% of households in Badakul have changed their food habits as a strategy to minimize frequent food shortages for the family. A directly related aspect concerns health problems in fisher households, as instances of health crises have shot up by 400% in the last less than a decade. Three important sets of data from the household surveys draw our attention to this fact: 1) 49% of households in Berhampur and 72% of households in Badakul cited health and hospitalisation as one of their three major heads of expenditure; 2) 50% of households in Berhampur and 70% of households in Badakul mentioned health problem and hospitalization as one of their four important reasons for financial crisis; 3) 49% of households in Berhampur and 74% of households in Badakul had health and hospital expenses as one of the six important reasons for which they took out loans. In tandem with these findings, the monthly household monitoring

data in the two villages showed that on average 46% of the households took loans, on any given month, for health-related crises.

A health crisis is not new to the fishers of Chilika. However, there are two recent trends associated with the health crisis that make it different from the past: 1) the frequency and intensity of health crisis have increased; and, 2) fishers now increasingly talk about mental or emotional health as a key element of health crisis. An increase in the frequency of health problems is attributed to changes in the quality of food and the problems in mental health situation result from excessive stress due to livelihood uncertainties, as was reported by 59% of households in Berhampur and 46% of households in Badakul. The absence of proper health care facilities and inadequate government support for health care has adversely contributed to this crisis. For Berhampur village, the nearest government hospital is at a distance of 40 kilometers and for Badakul it is at about a distance of 10 kilometers. However, fishers have to pay for expenses towards their treatment, including medicines. There is also a general perception that government health facility is comparatively less reliable and has many inconveniences associated with it. Consequently, fishers largely depend on private health care facilities by spending excessive amounts of money. This explains the linkages between the financial problems and the health problems explained in the preceding paragraph.

Expenses on children's education formed a significant component of the financial profile of fisher households in the two study villages: 39% of households in Berhampur and 59% of households in Badakul mentioned children education as one of the reasons for the financial crisis; 22% of households in Berhampur and 34% of households in

Badakul discontinued their children education as a coping strategy; 57% of households in Berhampur and 33% of households in Badakul opted to take loans for continuing their children's education. Even then, a significant number of households in both study villages preferred to stop sending their children to school in order to minimize the financial burden, and because the elder children could engage in income generating activities. This was evident in the high dropout rates (51%) and low enrolment (39%) in the village school of Berhampur. The school register shows that over the past seven years there has been a 70% fall in students who appear for the High School Examination. As Kunti Jena of Berhampur village explained:

> Four of our five children are in the village primary school and they generally go hungry on the Sundays and holidays because the school is closed and there is no 'mid-day meal'[40] available. I struggle to bring them books and school dress, but I am happy that they get to eat at least a meal most days in a week……., do not know how we are going to manage once they cross primary school.

Kunti's husband is on migration to Kerala and he had not sent back any money to the family. Like Kunti's children, the mid-day meal brings young children in the village to the primary school; if not for education, then definitely for a meal. Consequently, there is relatively better attendance in primary school classes but as children approach middle and high school they tend to drop out.

[40] The Mid-day Meal Scheme is the popular name for school meal programme in India. With a view to enhancing enrollment, retention and attendance and simultaneously improving nutritional levels among primary school children in grades 1 to 5, the National Programme of Nutritional Support to Primary Education (NP-NSPE) was launched as a Centrally (Federally) Sponsored Scheme in 1995 which covers all the development blocks in India. The scheme involves provision of lunch free of cost to school children on all working days.

5.4.2 Intensification / extensification Strategies

> I have already exhausted the existing sources of cash loans and advances, and no one wants to give me loans anymore even with higher interest rates. I cannot leave the village because my wife and two kids will be left alone. Neither have I land to undertake vegetable cultivation or tree plantation as some others in the village, nor can I start a village shop due to lack of finance. I am ready to sell my labour for daily wage but opportunities are really not available. I now plan to go back to fishing again and step up my efforts there in all possible ways. Prahallda Jena, Fisher, Berhampur village, November 2008.

For many fishers intensification is the only livelihood strategy available as they cannot migrate due to an absence of available labour from the household and a lack of start-up capital restricting diversification. Intensification becomes imperative as most of these households approach a point of saturation in terms of pursuing immediate coping strategies for subsistence. Fish traders are often forthcoming if households want to stay on fishing, or want to come back to it after periods of staying away for fishing, so that a steady supply of fish can be maintained. This also works as an incentive for many households to cling on to fishing and gradually intensify and extensify their efforts **(Table 5.6)**, even though this may not be sufficient.

In both Berhampur and Badakul, the bulk of intensification occurs within the fishing sector. **Table 5.6** outlines various sub-strategies and activities pursued by fishers for intensification in both the study villages. As a strategy, the fishers intensify their fishing activities to make the most of resources available under the given social-ecological conditions.

Table 5.6: Intensification as livelihood strategy

Sub-strategy	Activity
Gear selection and use	• Select synthetic nets of fine mess size • Use fishing nets that are catch intensive • Pick fishing gears that can be used in a variety of locations: shallower and deeper parts of Lagoon, and some in the sea
Stop seasonal fishing (no longer following traditional fishing seasons)	• Year-round fishing of all available species
No size restriction	• Catch all available sizes • Catch post-larval shrimp for sell to aquaculture ponds
No time and space restriction	• Fish anytime anywhere • Semi-permanent and permanent nets
No species restriction	• Catch all available species
Focus on single species (determined by availability, price, and market)	• Shrimp fishing • Specific fish species • Crab fishing
Aquaculture	• Productive Lagoon areas under intensive shrimp farming

The semi-mechanization of fishing is a fairly new phenomenon in Chilika (no more than three decades old) and started as a result of the interest in shrimp aquaculture. Prior to this time the fishers followed various traditional practices of fishing including hand woven cotton nets and the use of several locally available materials like bamboo, *rattan*, etc. With intensification most of the customary systems of fishing have changed significantly. The diversity of customary fishing practices, and their associated methods and techniques, were gradually replaced by a few dominant methods using synthetic gillnets and trammel nets (locally known as *khanda jala* or “disco nets”). With fine mess size and durability these nets proved to be exceptionally catch-intensive and became a frontrunner in the process of mechanising fishing in Chilika. With a variety of synthetic fishing gears available to them, fishers are able to select gears that can help in intensive fishing at different locations within the Lagoon – shallow water, deep water, near the river mouths, close to the sea mouth and, to a limited extent, in the Bay of Bengal too.

The replacement of traditional fishing boats with motorized boats also formed a significant part of the intensification strategy in Chilika.

Discussions with elderly fishers revealed that fishing in Chilika followed a strict seasonal routine before the onset of the livelihood crisis. Even though there were some overlaps, the year was distinctly divided into fish (July - October), shrimp (March - June) and crab (November - February) fishing seasons. After the onset of the livelihood crisis, intensification strategies included interfering with this seasonality in order to maximize catches. The new techniques enabled households to fish year round, disregarding seasonality. Most of these fish species are now caught throughout the twelve months of the year, in contrast to the original seasonality of only two to four months.

Earlier, under a regime of customary fishing, norms evolved by the communities offered safeguards to different species and sizes of fish, and specified the time and location of fishing. However, fishing intensification brought in strategies that by default removed the customary restrictions on the size, species, time and location for fishing. Fishers now compete with each other to catch all available sizes and species of fish in their drive to increase production.

After a number of trips on fishing boats and several visits to the shallow water trammel nets (for photo and video documentation of catch size) I learnt that at least 40% of the catch consisted of immature fish and crabs. The observation was further confirmed with several trips to local fish markets and landing stations where one can see undersized fish and crabs for sale, including out-of-season fish species. “If I do not catch these fish someone else will pick them up. I do not want to be a loser when incomes are already so

low", replied Deepak, a young fisher from Balabhadrapur village, whom I accompanied on a fishing trip.[41]

Restrictions on the time and location of fishing, which depended on tidal and fish movements, have now been replaced with semi-permanent or permanent nets that sit in the Lagoon day and night. Fishing intensification in certain cases also involves night-time fishing. More than 90% of the fisher households in both the villages own nets that can be placed in the Lagoon on a semi-permanent (long term) basis.

Intensification through targeting single species is practiced differently in different fisher villages. In Berhampur, crab fishing has been taken up by 33% of households as an alternate source of income in recent years. Previously, most of these households focused on catching fish and shrimp. This change was further confirmed by the fact that a comparable percentage of households have recently signed up with crab traders. Crabs enjoy a healthy demand, both in the local as well as export markets, and crab fishing also requires relatively low investment. In Badakul, the entire village now focuses primarily on *patua* fishing (fingerlings of one particular species) for about eight months in a year. They have developed nets of fine mess size (made out of mosquito nets) in order to catch fingerlings of *patua* fish, which is considered suitable both as raw and processed dry fish.

Even though their numbers are not significant, several households also engage in catching post-larval shrimp. An exact estimate on the number of households engaged in picking post-larval shrimp could not be obtained simply because a lot of households did

[41] Deepak's words indicate that there is a "tragedy of the commons" situation in the Lagoon as disappearance of seasonality is a symptom of a bigger issue of open access or the disappearance of rules of conduct which is discussed further in Chapter 4 on commons)

not want to report it, perhaps because it is technically illegal. These small shrimps are easy to catch and they are often sold to aquaculture ponds at a good price. Post-larval fishing is practiced by many households as part of their intensification strategy that focuses on exploiting target species. This strategy is largely influenced by the existing market demand, sustained by growing aquaculture in the Lagoon, including price. “It fetches a really good price compared to catching fish which is time consuming, high on investments and offers low returns,” said Bikram Jena of Berhampur village, who spent part of his fishing time catching shrimp post-larvae before he left on out-migration.

The connections between the sectors (aquaculture and post-larval fishing), and the resulting dependence of some fishers on aquaculture, could create divisions among fishers. However, this was not what the study revealed, which may be attributed to three factors: (1) Fisher households that pick post-larvae also include the majority of those with their own aquaculture ponds, with almost all retaining the post-larval shrimp for their own use, they do not sell to other / non-fisher aquaculture owners; (2) those households without their own aquaculture ponds engage in this activity only occasionally and seasonally, and the incomes from this source do not constitute a significant percentage of their total annual income (roughly estimated at < 5 percent); and, (3) the owners of the big ponds are not dependent on these fishers, rather, employing private labourers hired from outside Chilika area and also from non-fisher villages in Chilika for more organised collection of post-larval shrimp. Moreover, post-larval collection is also a major income activity for people in a large number of non-fisher villages (several times more so than those in fisher villages) around Chilika. Therefore, the big aquaculture owners are not relying on the supply of post-larval shrimp by caste-based fishers. It is evident from the

three factors that the nature of engagement by fishers in post-larvae collection and their limited dependence on the big aquaculture farms is unlikely to constitute a significant factor that can create political divisions among fishers on issue of their opposition to aquaculture. Inversely, the significant involvement of non-fishers in post-larvae collection acts as a counter-force to the opposition to aquaculture by fishers, especially given that in the Chilika area as a whole, fishers are in the minority, about 200,000 out of 500,000 (40 percent).

Only a few selected fisher households use shrimp aquaculture both as an intensification and extensification strategy. Not everyone is able to afford the high capital investment and labour inputs, and the capacity to operate successfully given the power dynamics that surround shrimp aquaculture activities in the Lagoon. Consequently, it is not surprising that only 5% of households in Berhampur and 2% of households in Badakul have currently taken up small-scale shrimp aquaculture as an alternate strategy for livelihoods. About an equal number of households said they had undertaken shrimp aquaculture a few years back but had to stop as it turned unmanageable due to diseases in the shrimp pond and the continuous loss of profit. Intensification in the form of aquaculture includes holding productive areas within the Lagoon as shrimp ponds for increasing production of tiger shrimps. Extensification is practised as a strategy to include more productive areas of the Lagoon under shrimp aquaculture and to also convert strategically located farm lands into shrimp ponds. Other strategies of extensification are listed in **Table 5.7**.

Table 5.7: Extensification as a livelihood strategy

Sub-strategy	Activity
Travel long distances for fishing	• Fishing outside traditional fishing boundaries • Fishing in others' territories
Capture strategic areas for fishing	• Fishing near sea and river mouths, channels that are key fish movement routes • Fishing in deeper parts of the Lagoon
Look beyond the Lagoon	• Traders buying sea fish • Traders employing sea going fishers
Catch all available species	• Increase the number of species in the catch basket without any limit
Product extensification	• Sale of freshwater fish • Dry fish of all possible species
Target non-fish species	• Fish to bird: Poach / hunt migratory birds (very limited)
More organized groups	• Permanent fishing camps inside Lagoon • Formation of fishing groups across villages
Aquaculture	• Extensive shrimp farming: Take more and more Lagoon areas under shrimp aquaculture

A sharp decline in fish stock, an enormous loss of customary fishing areas to encroachment, and a lack of access to existing fishing grounds due to ongoing conflicts have forced households to look for alternate areas for fishing. This implies that average fisher households now travel longer distances and often have to fish outside the village's customary fishing boundaries. At these locations, fishers not only face strong competition from other fishers but they also run the risk of fishing within the territory of another village. This is considered a form of extensification that results in fishers now competing to capture several strategic areas within the Lagoon as alternate fishing grounds - fishing near the sea and river mouths, and numerous channels that are key fish movement routes, areas near uninhabited smaller islands as they provide camping ground for fishers. The number of fishers who engage in deep water fishing has also increased significantly in recent years.

At a time when fishing areas have become scarce, extensification of fishing efforts is a growing strategy for desperate fisher households. I found many instances of fishers across villages organizing into small fishing groups, to pool available resources, and engage in fishing at different strategic locations within the Lagoon, including deep waters. I interacted with a number of these groups who operate semi-permanent or permanent fishing camps far inside the Lagoon, preferably near smaller islands. My discussions with village fish traders in Berhampur informed me that they have started buying sea fish in order to make up for the short supply of Lagoon fish in recent years. At least two fish traders in Berhampur now seasonally employ sea-going fishers whom they hire on contract from South India. A few other villages (like Arakhakuda) located close to the Bay of Bengal are in the process of gradually extending their fishing efforts into the sea.

Thus, extensification as a strategy has multiple manifestations in the context of Chilika. There is evidence that people from certain villages engage in poaching migratory birds for sale, and market channels now connect even the occasional catch of a stingray directly with the restaurants selling soup in Hong Kong and Singapore. Fresh water fish, mainly *Rohu* (*Labeo rohita*), is now an integral part of the bulk of fish sold at the stores of many Chilika Lagoon fish traders, as well as the catch sold by women who have taken up fish vending. This confirms that fishers in Chilika are using product extensification as a livelihood strategy in addition to their efforts to increase the unit area for fishing within the Lagoon.

5.4.3 Diversification as livelihood strategy

Due to a general lack of options and start up finances, livelihood diversification has not been a very successful strategy in Chilika. **Table 5.8** lists the various livelihood diversification strategies of Chilika fishers.

Table 5.8: Diversification as a livelihood strategy

Sub-strategy	Activity
Activities linked to primary occupation (fishing)	• Fish selling – both Lagoon and freshwater fish (women) • Dry fish (women) • Employment on fishing boats (men) • Employment at shrimp aquaculture farms (men) • Employment as boat driver: Fishing and tourist boats (men)
Use of available natural capital (private land assets): Creating future assets for income generation	• Making orchards • Vegetable cultivation • Tree plantation on homestead: Coconut and fruits
Host of non-fishing occupations	• Selling fruit from fruit trees at backyard • Open retail shops in the village • Daily wage • Salaried private jobs • Rearing cows, buffalos and goats
Engage women and children in income generation	• Women engage in several occupations • Adolescent children engage in livelihood related occupations

Table 5.9 illustrates that even after years of livelihood crisis and a staggering loss of incomes from fishing, most households in both study villages continue to retain fishing either as their primary or the only livelihood occupation. In this context, it is interesting to observe what makes diversification of livelihood activities difficult in the context of Chilika fishers? Since these are fishers by caste, who have for generations not done anything else other than fishing, they tend to lack the necessary skills and resources to take up alternate livelihood activities. Even though locally available options for livelihood are limited, what is available does not fit the existing skill levels of the fisher

households. This makes the diversification of livelihood activities outside the fishing sector, or not linked to Lagoon fishing, difficult.

Table 5.9: Percentage of households with fishing either as primary or only occupation

Villages	**Fishing as primary occupation**		**Fishing as only occupation**	
	Yes	No	Yes	No
Berhampur	96	1	27	70
Badakul	48	7	13	42

Diversification remains a "mental block" for several fisher households who consider fishing as a caste or cultural activity, a way of life, rather than an economic pursuit. This complicates livelihood choices further in terms of people moving out of fishing to non-fishing activities. The "mental block" not only comes from a sense of cultural connection to the Lagoon but also results from their fear of moving away from their traditional fishing as a way of life to a completely different way of life. Many old fishers think that by being born into a fishing caste, they are solemnly tied to fishing as their identity. However, the community members, who leave fishing and head to regional urban centers, have set off a process of cultural change which in turn is weakening the traditional notion of a "fisher community" as defined by caste. "Some migrant fishers now find it hard to express 'who they are' and 'which caste or community they belong to'. Consequently, the pride felt by individuals who belonged to the fisher community has been replaced by a deep sense of alienation, where occupationally displaced fishers do not feel they belong to either world - neither Chilika nor the city where they work as wage labourers (Robson and Nayak 2010:275)."

Even though there are limits to the success of diversification as a livelihood strategy, 44% of households in Berhampur and 68% of households in Badakul said they had taken up additional income generating activities to support their livelihoods. This is a significant change in Berhampur where fishing was the only livelihood occupation for 86% of households prior to 2000. In Badakul the process of livelihood diversification started about twenty years back, before which more than 91% of households followed fishing as the only occupation to support their livelihoods.

As part of their strategy for livelihood diversification fisher households take up several activities which are discussed here under three broad categories. First, households engage in a number of activities that are linked to their primary or only occupation, which is fishing. While men have opted for employment on fishing boats, jobs at shrimp aquaculture farms, a work as drivers on fishing and tourist boats, women have taken up dry fish processing and fish vending as a diversification strategy. However, data indicates that while men in both villages have adopted fishing related diversification as a livelihood strategy, it is only women in Badakul who have accepted similar strategies. The reasons for this are discussed further in the livelihoods outcome sections of this chapter.

Second, a number of households chose a host of non-fishing activities as part of livelihood diversification strategy. Activities such as front door retail shops, shops in the village or nearby market places, daily wage, salaried jobs (private and government), the sale of fruits from household trees and raising animals are part of this strategy. Third, several households make use of available natural capital, primarily land, in an effort to create future assets for income generation. If successful it can offer a stable source of

income to a small number of households in the fisher villages even though this is more of a long-term strategy for livelihood diversification. Activities under this strategy include commercial tree plantations on small patches of available land, and planting fruit trees such as coconut, mango, guava, lemon on homestead.

5.4.4 Migration as livelihood strategy

In this section, migration is discussed in terms of both out-migration and migrant work. Outmigration generally means moving away, whereas migrant workers retain homes in the community and return on a regular basis (Barbara Neis, pers. com.). In the two study villages, there is not a single evidence of "moving away" (either individually or with family), and in each of the cases where migration has occurred, migrant fishers have retained homes and families in the community and they return on a regular basis, some more frequently than others. Therefore, it would mean that all cases of migration in Chilika involve migrant work. However, a significant number of those who return from migrant work do not maintain any links with the village fishery institution and the resource base, especially young fishers.

As such, Robson and Nayak (2010) have used the term "circular migration" and/or "temporary migration" to explain this short-term nature of fishers' work related movements (migrant work) and the term "permanent migration" to denote what is referred to as "out migration" or "moving away". In addition to the important criteria of (1) whether retaining homes / families and (2) returning on a regular basis they also used the criteria of (3) whether the migrant fishers have been able to maintain their affiliations with the village fishery institution and (4) their livelihood linkages with the resource in order to determine the nature of migration either as circular / temporary or permanent. In

other words, if a migrant fisher does both (3) and (4), in addition to (1) and (2), then it indicates a level of disconnection denoting some sense of "moving away" (hence "out-migration"). This understanding would mean that Chilika case has both migrant workers (circular or temporary migration) and out-migration (permanent migration).

In Berhampur village, all five sons of Sudhakara Jena are on out-migration (as of June 2009) to different places in Tamil Nadu and Kerala. One of his sons first went in 2005 and four others followed him within the next one year. Sudhakar is 70 years of age and, in the absence of his sons, his family has given up fishing since 2006. His sons send him money which he uses to repay the huge debt that had accumulated over the years. He is also rebuilding the once unfinished family home in preparation for getting his sons married so that each of them can have a room with their wives. The prosperity of Sudhakar's family no longer rests on fishing but rather, in the continued absence of his sons from home, by migration (Interview with Sudhakar Jena and his wife Bimala Jena during household survey, August, 2007 and information from monthly household monitoring).

In Badakul village, Balmiki Behara's only son went to Kolkata in 1999 in search of a better income so that his family can move out of the debt trap and no longer struggle for income from a failing fishing occupation. Nine years on, Balmiki's son continues to live in Kolkata with his wife and one child, and struggles more than ever before to make a living with a monthly income of 1500 INR as a private security guard, an amount which is not even enough to rent a tiny room in the city. Balmiki regularly sends money to his son so that at least his grandchild does not go hungry. The family has lost most of its assets, and its debts have increased manifold. The only option for Balmiki is to hang on

to the fast declining fisheries as his wife continues to toil in her multiple roles as a fish vendor, seasonal wage labour and borrower from the thrift and credit group ((Interview with Balmiki Behera during household survey, January 2008, and follow up meetings until June 2009)

Pramod Behera of Badakul migrated to Chennai for the first time in 1997 as a construction labour. He returned after a couple of months realizing that he could do this for a few months per year and it was not a good idea to stay away from home indefinitely. Ten years later Pramod manages to combine seasonal migration with seasonal fishing and other local activities to earn a livelihood for his family. He takes up new loans but he is also able to repay some of that in time, and he hopes to continue his current livelihood strategies with seasonal migration as an important component of it. (Interview with Pramoda Behera during household survey, August, 2007 and information from monthly household monitoring)

In Berhampur village, Taranisen Jena's eldest of the three sons went on migration to Kerala in 2007. He returned back within a couple of months after being hospitalized for sickness. Taranisen spent 5000 INR on his treatment, an amount which his son could not even earn during his entire period of migration. On top of that he had taken a loan of 3000 INR to meet the costs towards his son's migration. For Taranisen, household migration as a livelihood strategy has not yielded desired results. However, the family expects to benefit from out-migration as two other younger sons prepare to migrate (Interview with Taranisen Jena, his wife Kumudi Jena and two sons during household survey, August, 2007, and follow up meetings).

With varying degrees of success, fisher households in Chilika have continued to depend on out-migration as a livelihood strategy (**Table 5.10**) ever since the emergence of the crisis. 53% of households in Berhampur and 31% of households in Badakul have pursued out-migration as a livelihood strategy since 2001, which is considered a landmark year in terms of loss of fish production due to the opening of a new sea mouth.

Table 5.10: Migration as livelihood strategy

Sub-strategy	Activity
Long-term migration	Migrate for indefinite period of time
Seasonal migration	Seasonal migration (for wage labour) becoming part of the annual cycle of livelihoods
Migrate within the state	Very few migrate within Odisha
Migrate outside the state	Most migrate outside Odisha to major cities in Southern and Western India

While none of the households in Berhampur had a history of out-migration prior to 2001, in Badakul 75% of the households had already used out-migration as a livelihood strategy as early as 1993 (as reported in Chapter 1). In contrast, 42% of households in Berhampur that migrated did so in the year 2007. This suggests that out-migration is a relatively new phenomenon in Berhampur as compared to Badakul where it started about two decades back. The difference in the trend of out-migration in these two villages resulted from the fact that the loss of fish production as well as local livelihoods occurred in different time periods. This is discussed further in the subsequent section on livelihood outcomes.

Although households continue to migrate, not all of them have done so on a long-term basis. **Table 5.11** suggests that the migrating members of fisher households return after a few months or years for reasons ranging from health issues to the non-availability

of work to exploitation at the workplace. In Berhampur alone, where most of the migration occurred during 2005-2007, 27% of households had members who had migrated but returned to the village by 2008. Considering pre-1993 as the start of out-migration in Badakul, 91% of the households that used migration as a strategy for livelihood had returned to the village by 2008.

Table 5.11: Reasons for returning from out-migration

Villages	**Health Problem**	**Language Problem**	**Hard work**	**Work not available**	**Still on migration**	**Other reasons**
Berhampur	5	1	6	2	38	6
Badakul	4	0	5	2	5	5

I tried to understand if there was a correlation between fishers' return from out-migration and the reasons for which they had migrated. One may tend to think that if there were tangible factors that forced fishers to migrate, their return may have been influenced by the removal of those same factors. In other words, if a fisher had migrated due to the burden of debt then he may be inclined to return home once repayment of the debt has been done. However, careful review of **Table 5.12** clarifies that all five factors that fishers had given as their reason for migration had remained in place as of 2010. Furthermore, the negligible earnings from migration by fisher households suggests that the levels of income from migration are so low that it is neither possible to repay their debts, compensate for the loss of income from Chilika, nor make alternate arrangements for the lack of employment opportunities locally, all of which triggered migration in the first place. In addition to the factors outlined in **Table 5.11**, there are other constraints, such as uncertainties attached to migrating to an unknown place, which restrict fishers

from pursuing out-migration as a more long-term and reliable livelihood strategy. Despite this 39% of the households in Berhampur stated that (as of August 2008) one or more of their family members had plans to migrate in the near future. In contrast, only 7% of the households in Badakul had similar plans.

Table 5.12: Fishers' reason for out-migration

Villages	**Loss of income from Chilika**	**Burden of loan**	**Lack of local employment**	**Degradation of Chilika**	**Other reasons**
Berhampur	50	49	34	39	23
Badakul	17	17	11	13	13

Note: Questions allowed for multiple responses

Not all households are in a position to afford out-migration; households with many adult men are in an advantageous position compared to those with fewer adult men. As out-migration often involves traveling thousands of miles outside the state boundary for unspecified periods of time, many households with single men find it difficult to opt for it as a livelihood strategy. It was rare (7% of households in Berhampur and 6% of households in Badakul) that single men in a household had migrated; an indication that these households were in a desperate livelihood situation after other strategies had failed. However, households with many young men tend to rely more on out-migration as a livelihood strategy when compared to households with elderly men. There was no instance of migration by women or, except for one or two cases, migration with family members in both the villages. Households that are part of an extended family were found to be more out-migration dependant than households consisting of nuclear families.

Although only men migrated, the cost and effect of their migration on sending families were profound. In the absence of men, the household stopped fishing because culturally it was only men who fished. Consequently, women in the household also discontinued their fish processing chores. Thus, out-migration by men also contributed to the disconnection of those family members who stay behind, from their customary Lagoon resources.

5.5 Outcomes of Livelihood Strategies

Livelihood strategies have definitely given some respite to the fishers in the short-run. However, the long-term effectiveness of these strategies remain in question. For example, most of these strategies were initiated six years back in Berhampur and about twenty years back in Badakul. And yet fishers have not been able to consolidate any significant livelihood alternatives that can generate a constant source of income for them. Rather, many of these strategies have led to the further weakening of the fishery-based livelihood of fishers and, more importantly, to their own disconnect with the Lagoon. The initiation of livelihood problems occurred with changes in the Lagoon social-ecological system - changes that were largely influenced by drivers at multiple levels as shown in Chapter 3 and Chapter 4. Fishers across Chilika commonly viewed their livelihood strategies as a response to such changes without any long-term planning. As village leader Mayadhara Das of Badakul puts it: “a short-term approach to livelihood crisis added momentum to the pace of our own disconnection with the Lagoon instead of improving our livelihood situation.” While important to highlight that aquaculture and sea mouth might have been two important drivers for the crisis in Chilika, it is equally

important to mention that the impacts of livelihood intensification and expansion strategies by the fishers themselves have also contributed to this crisis.

Table 5.13 compares the outcomes of fishers' livelihood strategies and their implications for the fishers' disconnection with the Lagoon and their marginalisation. Key resource persons in two focus group meetings in Berhampur and Badakul confirmed that the strategies were primarily aimed towards addressing livelihood crisis and income generation. There was hardly any effort to build strategies to deal with the factors that caused those crises: shrimp aquaculture, sea mouth, deteriorating ecological condition of Chilika, fisher unfriendly policies, loss of key community institutions. These factors actually constituted the context, resources and institutions as described in the livelihood framework (Scoones 1998; Bebbington 1999) changes in which had initiated a crisis in fishers' livelihoods. However, the fact that the current crisis in fishers' livelihoods was a creation of changes in context, resources and institutions did not receive attention in the formulation of livelihood strategies, thereby making their outcomes inappropriate to any long enduring resolution of the problem.

Table 5.13: Outcomes of livelihood strategies and their implications for fishers' disconnection and marginalisation

	Outcomes of livelihood strategies	**Implications for fishers' disconnect and marginalisation**
Subsistence	• Increased indebtedness • Lack of asset holding	• Compromise economic or financial assets
	• Decline in the quality and quantity of food	• Low levels of food security
	• High dropout from school • Decrease in high school level education	• Compromise human assets
	• Households subscribe to a number of fish traders • Breakdown of family support system • Politically silent	• vulnerable to exploitation by fish traders • Compromise social and political capital • Loss of political voice

Intensification	• Stop using a diversity of traditional fishing nets • Dominance of Lagoon unfriendly synthetic nets • Loss of knowledge to make fishing nets	• Loss of fishing related traditional skill sets and knowledge • Dependence on market to buy fishing gears
	• No distinct season for fish, shrimps and crabs • No periods of rest from fishing as previously done • Fish breeding season dishonoured	• Amplify existing fluctuations in fish seasonality
	• Small sized catch not released as previously done • Fish fingerlings killed while catching post-larval shrimp (by catch) • Overfishing of target species • Overexploitation of scarce fish resources	• Unsustainable fishing practices with implications for future fish availability
	• Pressure on already threatened levels of species composition • Disturbance in the Lagoon food chain	• Adverse ecological changes
	• Chemical pollution of Lagoon waters • Limited feeding and breeding areas for fish • Lower fish stock and production	• Shrinkage in Lagoon fishing area • Not everyone can invest in intensive fishing
Extensification	• Increase in instances of inter-village conflicts	• Protracted court cases with extraordinary financial implications
	• Fishing becomes capital intensive therefore expensive	• Not everyone can participate in such fishing
	• Restriction in fish movement • Selective lifting affects fish stock and composition • Disturbance in spatial distribution of fish	• Villages deprived of access to already limited fish stock
	• Encroachment of traditional fishing areas • Critical fish habitats – feeding and breeding grounds – under shrimp aquaculture	• Loss of access rights to fishing grounds •
	• Get arrested by forest and police department	• Get embroiled in police cases
Diversification	• Fishing to fish vending • Shift towards fresh water fish	• Fishers from entrepreneurs to wage employment • Move away from Lagoon fish
	• Landlessness as a major barrier to farm-based diversification	• Not everyone engage in this activity as they do not have land
	• Increase in non-fishing related occupations	• Non-fishing activities move the fishers away from the Lagoon
Migration	• High number of absent fishers (Berhampur) • High number of fishers not engaged in fishing • Income from migration is not financially rewarding • Family members live separately	• Physical absence from the Lagoon • Long absence weakens fishing rights • Young fishers find it difficult to return to fishing even if they are back in the village

Based on this analysis, one could conclude that livelihood strategies in Chilika have contributed to the ongoing process of fishers' disconnection and marginalization, on one hand, while failing to improve context, resources and institutions, on the other. Therefore, the strategies used did not necessarily produce sustainable outcomes. Rather, most of these strategies have physically, materially and psychologically disconnected the fishers from the Lagoon. I elaborate on some of the main outcomes of fisher's livelihood strategies and discuss their implications for fishers' disconnect and marginalization (**Box 5.1**).

Box 5.1: Key outcomes of livelihood strategies and implications for fishers disconnect and marginalisation

1. Compromise on various assets (capitals) including loss of social capital
2. Impact on Lagoon ecology and resource degradation
3. Loss of traditional skills and growing dependence on external market forces
4. Lack of commons with decline in access regimes
5. Loss of inter-household and inter-village equity
6. Livelihood diversification can disconnect too!
7. High rate of out-migration equals to large numbers of absent fishers

5.5.1 Compromise on various assets (capitals) including the loss of social capital

What makes repayment and the clearing of loans nearly impossible is the rate of interest and the purpose for which loans are taken. Not only are the interest rates high but the calculation of interest on the principal amount, until the entire loan is paid off, makes it difficult for fishers to clear up their loan amounts. A substantial part of the total loan is for consumption or/and other unproductive purposes. The majority of these loans are from informal sources that have an interest in perpetuating the cycle of debt. This has resulted in fisher households falling into a debt trap.

For fisher households, compromise with the quality and quantity of food is rather a compulsion than a planned strategy. This has serious implications for household food security. A food culture that is predominantly based on “rice and fish” is fast changing into a situation where a significant number of households now eat less of both. A change of food habit from eating lagoon fish, which fishers never had to buy, to regularly eating potatoes or occasional fresh water fish, which they have to pay for, is becoming common in households. The obvious fallout of these changes is on the health status of fisher families, which is in constant decline. Fisher households now tend to spend more on health and hospitalisation. Moreover, these changes signify a move from the earlier resource dependence to cash dependent household economies. This trend may not be viable in an already cash strapped marginalized society. Low levels of education due to high dropout rates from school restrict the future possibility of fisher children taking up mainstream jobs. In a society that is divided on caste and class lines, low levels of education can bring further exclusion to groups that are already on the margins.

Even though more fish traders mean a higher availability of interest-free advances, such arrangements make the fishers vulnerable to further exploitation at the hands of the fish traders. The arrangement is similar to a “bonded labour” situation, where fishers are forced to sell their produce to traders even though it may fetch better prices elsewhere. Moreover, prices offered by traders further bring down the profit level for the fishers. The practice of cutback or commission, ranging from 2 - 20 INR depending on the type of fish, brings prices down further. As such, the relationship between fishers and traders is in itself a factor for marginalization, and fisher households subscribing to multiple traders go through this even more intensely. **Table 5.14** outlines

the strings attached to the cash advances offered by the fish traders. In many cases, the fish trader has taken away fishers' boats as the advance money could not be returned. In other cases, fish traders have threatened to take away fishing boats if the advance money is not returned.

There has also been a breakdown in the family support system as livelihood crisis is seeing the prevalence of the nuclear family instead of the extended family system; a strategy taken up by many households to minimize the intensity of livelihood crisis on bigger families. A continued crisis situation and fishers' particular focus on livelihood alternatives has resulted in their withdrawal from public life, an indication that more and more fishers are becoming politically silent and may be in a process of losing their political voice.

Table 5.14: Receiving an advance from the fish buyer

Conditions of Advance	Strings attached
Obligation to see only to the trader	The fisher is obliged to sell fish only to the trader who provides the advance
Short-changed on weight	1100 grams considered 1 Kilogram
Short-changed on price	Mostly pre-determined price or a price often lower than the highest available market price
Commission	Shrimp 10-20; Fish 7-10; Small fish and shrimp 2-5; Crab - variable rates (All prices in Rs)
Return of advance	Violation of any of the conditions result in immediate return of the advance

5.5.2 Impact on Lagoon ecology and resource degradation

The outcomes of intensification and extensification strategies have directly impacted the ecology of the Lagoon and brought further degradation in resource

condition; a factor that is potentially strong in bringing down the quality of lives of the resource dependent poor. A set of intensification strategies resulted in the alteration of fish seasonality, lack of attention to the fish breeding periods, bringing key fish habitats under exhaustive fishing activities, all of which contributed to an amplification of the existing fluctuations in fish environments. Fishing behaviours changed to capture fish of all sizes by forgoing the customary norm of releasing small sized catch; destroying more numbers of post-larval fish while picking post-larval shrimp for aquaculture ponds; overfishing target species and overexploiting scarce fish resources at the cost of impacting fish stock and production. Such outcomes exerted pressure on species composition, altered the spatial distribution of fish, and disturbed the Lagoon food chain. Thus intensification in Chilika has led to a situation of "fishing down the food chain" (Pauly *et al.* 1998), ultimately contributing to adverse ecological changes. This study emphasises that ecological degradation has a tendency to disconnect the population that depends on it for livelihoods.

5.5.3 Loss of traditional skills and growing dependence on external market forces

As outlined in Chapter 4, customary techniques used by the fishers were based on caste, season, species and specific to fishing locations within the Lagoon. A diversity of fishing nets were locally made by the fishers and used to support customary fishing practices. With intensification, there was a significant change in the traditional fishing methods and techniques that were gradually replaced with synthetic gill nets and trammel nets. As an outcome, fishers stopped using a diversity of fishing nets and, more importantly, stopped making them locally. Instead, they grew dependent on the market for buying synthetic nets, which most fishers found difficult in a cash strapped local

economy. Moreover, communities experienced a steady loss of fishing related traditional skill sets; specifically the knowledge to prepare a variety of fishing gears that were socially and ecologically appropriate. Thus, in Chilika, growing dependence on external market forces and the loss of traditional skills contributed to the process of disconnection of fisher communities from the Lagoon.

The outcomes of uninterrupted aquaculture consistently impacted the Lagoon ecosystem and its interlinked social structures. This was evident as shrimp aquaculture activities, used both as intensification and extensification strategies, had multiple social-ecological influences on the level of fishers' disconnection and marginalization. In response to the survey question, on "Are you experiencing any adverse impacts of shrimp aquaculture either on the Lagoon or on your fishing activities, or both?", 35 fisher villages in Chilika replied that they were adversely impacted. On one hand, it has led to chemical pollution in the Lagoon and the encroachment of important fish habitats thereby limiting the fish feeding and breeding grounds, and affecting fish stock and catch size. On the other hand, aquaculture has resulted in shrinkage of the Lagoon fishing area through encroachment, which has led to serious concerns over fishers' access to both the scarce fish stock and fishing areas (See Chapter 4 for details). More than 70% of fisher villages reported loss of customary fishing areas, ranging from 10 - 100% of the total area, to encroachment by powerful shrimp *mafias*. Thus, aquaculture led class exploitation was in itself a form of marginalization.

5.5.4 Lack of commons with decline in access regimes

In addition to encroachment, extensification strategies have pushed fishers beyond their customary fishing boundaries and initiated competition for capturing strategic

fishing areas, all of which have contributed to an overall increase in the instance of inter-village conflicts. Several villages are now enmeshed in prolonged court cases; villages borrow money, often through sub-lease of fishing areas to shrimp aquaculture owners, in order to pursue these legal disputes. Villages like Satapada and Kumarpur have debts to the tune of US $ 200,000 each, a phenomenon common to several fisher villages across Chilika. Fisher villages largely disregard once agreed-upon boundary rules that had laid the foundation for commons formation in Chilika; a situation indicative of an open access regime and a trend towards the decommonisation of fishery resources in Chilika (as discussed in Chapter 4). These outcomes suggest that a lack of commons status with a decline in access regimes has led to the marginalisation of fishers.

5.5.5 Loss of inter-household and inter-village equity

Outcomes of both intensive and extensive fishing strategies have also resulted in serious implications for inter-household equity issues. Consequent to these strategies, fishing has become capital intensive, and therefore expensive, leading to the exclusion of several poor households from fishing. This has increased the gap between rich and poor in the villages resulting in the further marginalization of poorer households. This gap is further widened by the lack of options for poor households to diversify their livelihood activities. Landlessness, a status affecting more than 83% of households in both study villages, emerged as a major barrier to farm-based livelihood diversification. While households with land assets tried to use available natural capital through cultivation and plantations, the landless poor could not do so. These households also find it difficult to diversify into other non-fishing activities due to the absence of financial capital that is available to some well-off households. As a result, while the richer households tried to

initiate a small business as part of their diversification strategy, the poorer households in the two villages have primarily gone into daily wage, including out-migration. Therefore, growing equity concerns as a result of various livelihood strategies are emerging as factors for marginalization of Chilika fishers.

5.5.6 Livelihood diversification can disconnect too!

While fewer options for livelihood diversification can make households prone to getting marginalised, a somewhat similar trend was also observed in cases where households did diversify their livelihood activities to a number of fishing and non-fishing occupations. In the case of Prasant Behera and his wife Jyanti Behera of Badakul, the move from fishing to fish vending signifies a change from being an entrepreneur to accepting a form of wage employment. They consider this as a form of disconnect from the Lagoon. Since a number of fisher women (fish vendors) now sell fresh water fish bought from the central fish market their chances of staying connected to the Lagoon is gradually decreasing. Hajari Behera of Badakul, whose household has taken up both out-migration and seasonal jobs as a boat driver, sees these non-fishing activities as pushing them away from the Lagoon, a form of disconnect that is resulting in their physical separation from "mother Chilika." Both Prasant and Hajari are apprehensive about their continued existence in the new occupations. As caste-based fishers, they think that livelihood activities other than fishing would soon disengage them from the Lagoon.

Studies elsewhere have shown that diversification is a desired strategy that could help in situations of livelihood crisis (Marschke 2005; Ta 2010). However, livelihood diversification becomes impossible in the absence of various capitals, most importantly natural and financial capitals, and it may produce only limited results. In resource

dependent poor communities, diversification requires continuous government support in terms of income generating programmes as well as the protection of fishers' access to the resource through appropriate policy provisions. Successful diversification of livelihood activities could potentially curb the ever increasing influence of extensification and intensification in Chilika, apart from having a positive impact on the trend in out-migration.

5.5.7 High rate of out-migration leads to large numbers of absent fishers

A high rate of out-migration equates to a large number of absent fishers in the villages. This physical absence of fishers from the Lagoon is a leading form of disconnect that may have lasting future implications. Fishers fear that such long absence from the Lagoon may eventually weaken their fishing rights not only as individual or household right-holders but their stake in the Lagoon as a collective. Since incomes from out-migration are not particularly rewarding, the "poor" status of fishers and their livelihood conditions (prior to their out-migration) either remains unchanged or worsens further. The level of disconnect is intense in the case of young fishers who find it difficult to return to fishing even if they are back in the village and no longer planning to migrate.

5.6 Predictable Sequence of Livelihood Strategies: Lessons for Future Transformations

Since the livelihood crisis in Chilika is in a continuous flux it is difficult to imagine a fixed set of strategies that could help fisher households cope with the situation on a more long-term basis. The unpredictable nature of the crisis makes it difficult to choose key strategies that could be used more consistently in order to stabilize livelihood

processes. Consequently, the selection of livelihood strategies remains contingent to the changing nature of the crisis, a situation that makes fisher households increasingly vulnerable to being disconnected from the resource base.

The nature of livelihood crisis in Chilika is long drawn and persistent. Since the livelihood crisis and the factors that caused it are still prevalent, it may be important to understand their development and future implications. This section will attempt to further examine two related aspects of fishers' livelihoods: 1) Draw up a predictable sequence of future livelihood strategies in Berhampur and understand the past nature of livelihood crisis in Badakul by using both villages as mirrors for each other. 2) Suggest elements of possible future livelihood scenarios in Chilika using the current situation in Berhampur and Badakul as models.

5.6.1 Using Berhampur and Badakul as mirrors for each other

The large number of fisher villages and their geo-political spread suggest that social-ecological changes leading to livelihood crisis may have followed different time periods. This observation is also consistent with findings in the two study villages: Berhampur, situated at the east end of the Lagoon, at a close proximity of the sea mouth and Badakul, located in the northern sector of the Lagoon close to the south end where it connects to the river. My findings indicate that even though different factors played a role in these two contexts, the livelihood crisis in Badakul began as early as ten years prior to its occurrence in Berhampur. Using this time gap as a point of analysis it is possible to describe the directions in which livelihood strategies have moved in the two villages.

Available data suggest that, in terms of livelihood crisis and fishers strategies, Berhampur is now going through what Badakul had itself gone through several years previously.

Table 5.15 summarizes the status of current livelihood strategies in Badakul after fifteen years from the first occurrence of livelihood crisis. The sub-strategies and activities points to several emerging trends linked to the household livelihood strategies in Badakul. These trends include: 1) the continuation of activities listed under coping strategies on a more long-term basis; 2) the use of innovation and specialization as seen under intensification strategies; 3) extensification and diversification strategies such as making strategic combinations of shallow and deep water fishing, and non-fishing and fishing activities; 4) change in preferences for livelihood choices with an interest in non-fishing and salaried jobs, and increase in the role of women in livelihood activities as under diversification strategies; 5) stabilization and reversal of certain activities as observed under strategies for out-migration. The development of livelihood crisis and household level strategies in Badakul, and the time gap between the two villages, offer some analytic scope to: 1) explore if Berhampur would follow the same livelihood directions as Badakul; and, 2) understand where Badakul was in terms of livelihood crisis and strategies about fifteen years ago when the crisis started.

The study identified at least five indicators (**Box 5.2**) that hint at the possibilities of Berhampur following the footsteps of Badakul. Fishers confirmed that all five indicators were associated with the livelihood crisis and the process of making household strategies in Badakul as they are now seen in Berhampur. Also, close comparisons suggest that the nature of livelihood crisis and sequence of household strategies in

Berhampur are similar to what they were in Badakul about fifteen years back. "We thought these guys (fisher of Berhampur) were blessed because they lived close to the sea mouth and they will continue to live happily with Chilika. But just like the seasons change their fate has brought them to exactly where we were in the mid 1990's," said Pankaja Behera of Badakul.

Table 5.15: Current livelihood strategies in Badakul suggesting possible directions for Berhampur

Livelihood Strategies	Sub-strategies and activities
Coping for subsistence	• Borrow money from different sources and mortgage • Fluctuations in quality and quantity of food habit • Low rate of high school education • Changes in relationship with fish traders • Some participation in advocacy and activism
Intensification	• Selective intensification methods • Area, species and gear specialization with some innovation • Create and adapt to new seasonality • Some use of traditional fishing techniques • Catch smaller size fish
Extensification	• Combination of deep and shallow water fishing • More households prefer to go long distances for fishing • Try to avoid fishing in others' territories • Fishing groups • Fishing focused in strategic areas (e.g. near shrimp ponds)
Diversification	• Strategic combination of fishing and non-fishing activities • Adapt to a host of non-fishing occupations • Land-based activities not a common source of income • Women have a major role in diversification: Actively engaged in income activities • More households try for salaried jobs: Berhampur may opt for jobs in tourist hotels
Out-migration	• Drop in the rate of out-migration • Reverse migration: Return of most that had migrated • Low intensity migration continues • No migration by women • Migrate primarily outside the state • Migration mainly seasonal and for short periods • Occasional or no permanent relocation at migration site • Out-migration used more as a diversification strategy

Source: Household survey, monthly household livelihood monitoring, focus groups and interviews

Box 5.2: Indicators influencing livelihood crisis and fishers' strategies in both study villages

- **Drivers of crisis:** Shrimp aquaculture, fishing are encroachment, growing conflicts, sea mouth related factors (mouth closer in case of Badakul and mouth opening in case of Berhampur)
- **Nature of crisis:** Loss of biodiversity, loss of productivity
- **Impact of the crisis:** Loss of fishing -based livelihoods
- **Initial strategies and Actions:** Mostly coping strategies to start with followed by other strategies
- **Social-ecological and political environment:** Ecological degradation, inadequate government support, fisher vs. non-fisher conflicts

Source: Household survey, monthly household livelihood monitoring, focus groups and interviews

5.6.2 Future transformations in livelihoods and possible scenarios

Thus, using the current livelihood strategies in Badakul (**Table 5.15**) and the set of indicators (**Box 5.2**) one can predict the directions in which livelihood strategies in Berhampur might move in future. However, using the same analysis it is difficult to predict the directions which livelihood strategies in Badakul might take. Also, we do not know what livelihood directions Berhampur might take once it has arrived at the stage at which Badakul finds itself currently. In other words, it would require a long-term vision to understand the nature of the livelihood crisis and the corresponding household strategies in a future scenario. With this objective, an attempt has been made to present a predictable sequence of changes in livelihood strategies leading to alternate scenarios. **Table 5.16** outlines the key features of the livelihood scenarios.

Table 5.16: Elements of future livelihood transformations in Chilika based on four scenarios

1. Berhampur Model: Early stage crisis	2. Badakul Model: Late stage crisis	3. Business as usual Scenario leading to SES transformation	4. Empowerment Scenario
Focus on coping strategies, differential strategies by different households	Experiment with a mix of livelihood strategies	No significant alternate livelihood activity emerges, different combinations of strategies	Focus on strategies for livelihood diversification; Combination of fishing and non-fishing activities emerge
Fishing is still the main	Fishing is not main	Many households	Increase in fishing

source of income	income source for most	permanently displaced from fishing; More fishing villages take up shrimp aquaculture	related incomes
Uncontrolled levels of migration	Migration in moderation	High migration with some tendency for permanent relocation; women may join in	No migration or occasional migration
Growing indebtedness	High indebtedness continues	High debt prevails; Lack of institutional finance; Increase in loss of asset	Occasional dependence on debt with capacity to repay; Creation of assets
No or a few women engage in income activities	Women lead the livelihoods processes; Women on wage and other income generation activities	Women continue to lead the livelihoods process	Women active in income generation activities as entrepreneurs
Increase in high school level dropout rates	Decrease in levels of school education	Further drop in levels of education	More enrolment at high school level education
Moderate levels of encroachments	High rate of encroachment and related conflict	Permanent loss of fishing areas to encroachment; increase in legal cases; some villages may regain areas	Release of fishing area from encroachment
Fishing area sub-lease in some villages	Fishing area sub-lease in most villages	Long-term sub-leases; Some villages give up fishing areas and others get into legal disputes over return of sub-leased areas	Most villages decide to stop sub-lease of fishing areas
Conflicts, but mostly non-fishing related conflicts	Increased instances of fishing related conflict	Instances of conflict continues with more legal battles	Resolution of existing conflicts and reduction in instances of new conflicts
Tendency towards unsustainable fishing	Established practices of unsustainable fishing	Unsustainable fishing continues; some stiff regulation by government	Villages collaborate to restrict unsustainable fishing
Government support not forthcoming	No significant support from government	No significant change in government support; series of regulations may further exclude and restrict fishers' rights	Significant changes in government support; Income generation programmes specifically designed for fishing households; Policies for involving fishers and facilitating their rights
Fishers critical of government's approach to Lagoon management	Anti-government feeling		
Maintain political isolation and silence	Some political activism; mostly	Political action through protests and movements; Some fishers may prefer political isolation	Adequate levels of political awareness and stronger fishers institutions

Source: Household survey, monthly household livelihood monitoring, focus groups and interviews

In this analysis current livelihood scenarios in Berhampur and Badakul have been considered as two models (**Table 5.16 and Figure 5.2**). Two other future scenarios, i.e., business as usual and empowerment scenarios, were visualized based on: 1) the emerging trends in livelihood crisis and strategies from Berhampur and Badakul; and, 2) through a series of consultations with key stakeholders on how bad or good the current livelihood situation might become.

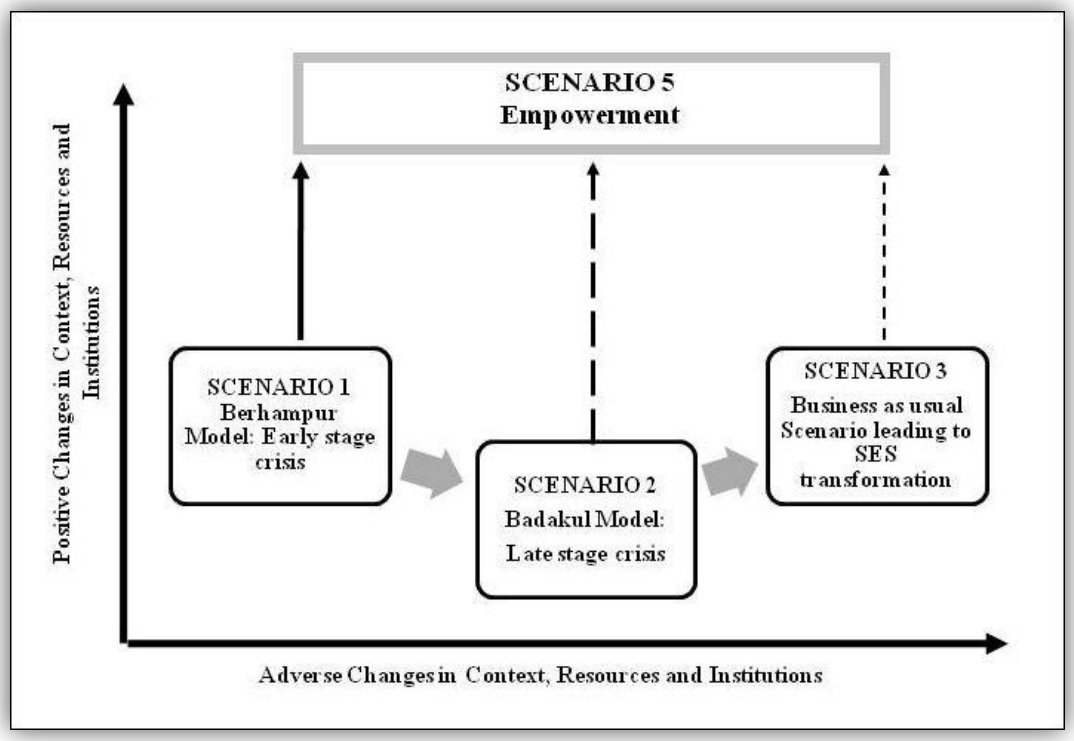

Figure 5.2: Elements of future livelihood transformations in Chilika based on four scenarios

Figure 5.2 considers that adverse or positive changes (indicated by horizontal and vertical arrows) in context, resources and institutions act as drivers for the movement of fisher villages between different scenarios. If there are further adverse changes in context, resources and institutions in Chilika then Berhampur would move to a livelihood scenario similar to Badakul at present and Badakul would experience further changes in the

livelihood conditions by arriving at a business as usual scenario. Inversely, if there are positive changes in context, resources and institutions then the movement of villages from one livelihood scenario to another will take a significantly different turn, i.e., both Berhampur and Badakul would move vertically towards an empowerment scenario, thereby bringing about significant improvements in their current livelihood status. This analysis confirms the earlier discussion that livelihood strategies in both villages did not lead to sustainable outcomes because they primarily aimed at addressing the livelihood aspects of the crisis without adequate strategies to deal with adverse changes in context, resources and institutions (refer **Figure 5.1**). I have already discussed the historical and political context of resource management in Chapter 3 and changes in Lagoon ecology and resource conditions in Chapters 3 and Chapter 4. The next chapter will investigate institutional arrangements in the context of Chilika.

Women, who used to deal with large fish processing, now manage with fingerlings
Photo: Prateep Nayak

CHAPTER 6

INSTITUTIONS OR THE LACK THEREOF:

ANALYSING MULTILEVEL ARRANGEMENTS

6.1 Introduction

Chapter six asks the question: what does the future hold in terms of institutions? It deals with institutional arrangements and processes in Chilika Lagoon to understand their linkages across levels of social and political organizations, and examines their overall implications for fishers' marginalization from a decision-making and institutions point of view. It brings into discussion how even in situations where there are plenty of institutions there could still be critical gaps or a lack of linkages resulting in an "institutional vacuum" and, at the same time, shows trends of scale dominance (the influence of higher scale organizations over lower level institutions) and the cooptation of ground-up institutional processes by top-down authority. The chapter analyzes various institutional issues in Chilika from the point of both historical developments and current trends, and attempts to identify "what type of institutional arrangement could possibly lead to governance successes" as this relates to sustainability in the case the Chilika SES. It considers different forms of institutional arrangements that include co-management (Pinkerton 1989; Jentoft 1989), bridging organizations (Brown 1991; Cash 2001; Folke *et al.* 2005) or boundary organizations (Guston 1999, 2001; Cash and Moser 2000; Berkes 2009), cross-scale institutional linkages and governance (Adger 2001; Cash *et al.* 2006; Berkes 2006), multi-level institutional management (Ostrom *et al.* 1999; Young 2002; Adger 2003; MEA 2003), institutional interplay (Young 2002, 2006), i.e., multifaceted

interactions across scales and levels, scale dominance and institutional cooptation (Lele 2000; Gelcich *et al.* 2006; Nayak and Berkes 2008), and polycentric systems (McGinnis 1999, 2000; Oakerson 1999; Ostrom 2005a; Andersson and Ostrom 2008) to discuss ways through which the current "institutional mess" in Chilika may be addressed.

Following a brief discussion of alternative institutional arrangements, I briefly outline the structural and functional layout of various institutions in Chilika Lagoon at four different levels: local, state, national and international. Based on this, the discussion section focuses on some emerging trends and the overall status of institutional processes in Chilika. In the concluding section, I try to deal with the questions of "how to bring new institutional balance" and "how to achieve a more functional but equitable multi-level institutional network," by suggesting that a polycentric governance arrangement is the way to go.

6.2 Institutional Arrangements in Theory

Commons scholars tend to differ in their focus on the importance of community institutions. While some believe that communities in themselves are able to create the conditions for successful commons regimes, others argue in favour of building stronger institutions as a precursor (Berkes 2004; Ostrom 2005a). Communities are not often homogeneous entities. They have historical and cultural complexities within a given context that considerably affect the current and future relationships and power equations within a society (Nayak and Haque 2005). Communities are not firmly situated in time and place; instead, they are located within a dynamic system that keeps them moving and adapting to emerging situations (Robson and Nayak 2010). Such characteristics of

communities make them multidimensional, cross-scale, socio-political units or networks changing through time (Carlsson 2000). This also makes community a complex entity; hence, Berkes (2004) suggests that it is more logical and effective to focus, not on communities *per se*, but on their pertinent institutions. The strength of institutions and their arrangements lie in their ability for renewal and reorganization, learning and adaptation, and for dealing with change (Holling 2001; Berkes *et al.* 2003). Thus, community-based institutions, not communities themselves, can create conditions for sustainability of the commons (Berkes *et al.* 2003). Moreover, in a complex system approach all levels are important for institution building but when looking at community-based management, by definition, the starting point is the local level (Berkes 2006, 2007a).

There is general agreement that commons are complex systems because they tend to be scaled and they exhibit uncertainty and self-organization (Gunderson and Holling 2002; Wilson 2002, 2006; Adger *et al.* 2003; Ostrom 2005a; Berkes 2006). Multiple drivers at various levels influence resource management, making it imperative to approach the problem of commons as the management of complexity at different scales (Adger *et al.* 2006b; Lebel *et al.* 2005). Moreover, because cross-level linkages are so pervasive, attention to community level institution building alone may not be sufficient to provide for effective management (Berkes 2006). Management at all levels is required but the local level is important as the starting point (Berkes 2007a); therefore, we need to move in a bottom-up direction in our effort to build successful institutions for management of the commons. However, it is important to consider that higher levels may be necessary but not at the cost of the local level. Failure to recognize both the local level

institutions along with bottom-up arrangements, and giving them the political space to continue may lead to the marginalization of institutions and people.

It is true that we need a large variety of institutional arrangements to deal with the complex resource management situations. It is also true that such a large variety in itself may not lead to sustainable management. We require appropriate linkages among these institutions across multiple scales and levels in order to make these institutions effective and meaningful. This becomes particularly important as recent papers have identified "missing institutions" and "missing linkages" as factors for looming multi-scale failures as well as obstacles to empowerment (Walker *et al.* 2009; Almudi and Berkes 2010). Therefore, institutions in themselves would not lead to sustainable resource management but success would also depend on the extent to which these institutions are able to connect to each other transcending multiple geographical, administrative, political, and social-ethnic boundaries. With its links to complexity thinking, the cross-scale literature is a growing subject area within commons research (Adger 2001; Cash *et al.* 2006; Berkes 2006) which recognizes the need to consider multiple levels of management (Ostrom *et al.* 1999; Young 2002; Adger 2003; MEA 2003). However, only some of the commons literature, in the area of co-management in particular, explicitly deals with multi-level management necessitating additional empirical knowledge on the impact of the higher scale on the lower scale, and forms of commons institutions with potential for cross-scale governance (Berkes 2006).

In theory, multi-level linkages in a globalized world are important (Lebel *et al.* 2005; Adger *et al.* 2006b; Berkes 2008) but they require significant attention to the risk of cooptation (Lele 2000; Gelcich *et al.* 2006; Nayak and Berkes 2008). In practice,

better linkages to the global shrimp market may bring short-term economic gains but it may lead to large-scale changes in the Lagoon ecosystem and jeopardize the livelihoods of fishers. Therefore, we need to have institutional linkages that help avoid cooptation and promote the strengthening of institutions across all levels. However, the lack of linkages across scales and levels, and problems associated with the cooptation of institutional processes including scale dominance (the impact of higher scales on lower scales) may be addressed through creating institutional arrangements that provide an arena for trust building, sense making, learning, knowledge co-production, vertical and horizontal collaboration, and conflict resolution (Hahn *et al.* 2006; Berkes 2009). These arrangements are referred to as "bridging organizations" (Brown 1991; Cash 2001; Folke *et al.* 2005) or "boundary organizations" (Guston 1999; Cash and Moser 2000; Berkes 2009)[42] and the functions they carry out are known as "bridging functions" (Olsson *et al.* 2007).

Bridging organizations can create the space for institutional innovations and the capacity to deal with abrupt change and surprise (Olsson *et al.* 2007). They explicitly focus on the differences across levels about what is perceived as salient, credible, and legitimate, and what is perceived as the important scale or level of the problem and plays an intermediary role between different arenas, levels, or scales (Cash *et al.* 2006). The role of bridging organizations includes creating effective local organizations, horizontal linkages across sectors, and vertical linkages that enable grassroots influence on national policy-making (Brown 1991). Thus, bridging organizations are not only effective in

[42] Bridging organizations are similar to boundary organizations, as originally described for the two-way translation between science and policy spheres (Cash and Moser 2000), but are considered to have a broader scope than boundary organizations (Hahn *et al.* 2006).

dealing with the problem of scale and levels; the outcomes of bridging functions could potentially create effective checks and balances against scale dominance and cooptation. Moreover, these intermediary organizations seem to play a central role in stimulating, facilitating, and sustaining adaptive co-management and adaptive governance (Folke *et al.* 2005) which are key instruments for bringing together multiple institutional and individual stakeholders onto a common platform. Bridging organizations can also have a significant role to play in enhancing the "fit" in SES (Olsson *et al.* 2007).

In a complex and multi-level world, the task of dealing with institutional plurality where there can be different institutions that overlap in jurisdiction and capabilities is a real challenge. While there is a lot of meaning in having strong community-based and smaller-scale institutions at the helm of resource management, attention to the community level alone is never likely to be sufficient to provide for effective management (Berkes 2006), and such an overemphasis runs the risk of defining issues at one level instead of many (Cash *et al.* 2006). Andersson and Ostrom (2008) observed that "while we certainly do not deny the importance of local institutions, we argue that institutional arrangements operating at other governance scales - such as national government agencies, international organizations, NGOs at multiple scales, and private associations – also often have critical roles to play in natural resources governance regimes, including self-organized regimes." In this context, smaller-scale, community-governed resource institutions may be more effective than centralized government in achieving many aspects of sustainable development but, at the same time, the absence of supportive, large-scale institutional arrangements may be just as much a threat to long-term sustenance as the presence of pre-emptive large-scale governmental agencies

(Ostrom 2005a). The critical challenge is "how to build relationships among these multiple authorities with overlapping jurisdictions" which is an area being dealt with by scholars working on *polycentricity* (McGinnis 1999, 2000; Oakerson 1999; Ostrom 2005a; Andersson and Ostrom 2008).

Vincent Ostrom (1999:57) defined a polycentric order as "one where many elements are capable of making mutual adjustments for ordering their relationships with one another within a general system of rules where each element acts with independence of other elements." A recent paper noted that polycentric interunit relationships may be independent or interdependent, informal interactions can be as important as formal ones, and cooperative and competitive feedback loops intersect (Brewer 2010). Such a diverse notion of polycentricism hints at high levels of uncertainty and unpredictability in resource management situations, and helps to analyze the role of institutions in the management of complex systems. Ostrom (2005) explains polycentric as a system where citizens are able to organize not just one, but multiple governing authorities at different levels. While large-scale units are part of effective governance, small and medium-scale units are also necessary components; simply recommending a single government unit to solve global collective action problems needs to be seriously rethought and the important role of smaller-scale effects recognized (Ostrom 2009, 2010). Rather than a neatly nested and discrete array of organizational units, however, polycentricism envisions less orderly networks of governing bodies with partly overlapping jurisdictions (Brewer 2010).

In summary, increasing complexities in resource management systems require particular attention to appropriate institutional design and arrangements. There are, in fact, several possibilities, the success of which would depend on specific resource

management contexts. However, analysis of existing literature on the subject emphasizes four interrelated areas: (1) focus on institutions and institutional complexity with attention to the local level first and then moving in a bottom-up direction; (2) institutional linkages across scales and levels in view of "missing institutions" and the role of bridging functions; (3) possibilities for co-management but with attention to scale dominance and cooptation; and (4) institutional plurality in the context of overlapping jurisdictions and the need for polycentric institutional arrangements.

6.3 Layout of the Institutional Arrangements in Chilika

Five broad levels of institutions – local, Chilika / district, state, national and international – were seen in the context of Chilika Lagoon. **Table 6.1** outlines the institutional arrangements related to Chilika Lagoon across scales and levels. I discuss some of the key institutions at each level with a specific focus on the local and Chilika / district levels which are important to understand the current state of the fisher organisations that had sustained the Lagoon fishery management for a long time.

6.3.1 Local and Chilika / District Level

In Chilika the organization of fishing villages has both a customary and a revenue orientation. Customarily, most of these villages are distinguishable based on the caste system where a village would be inhabited by a particular caste group or several caste groups with one or two castes forming the majority of households. These villages all along Chilika combine a variety of demographic arrangements such as villages with only fisher castes (one particular fisher caste or several fisher castes); villages with only non-fisher castes (mostly higher castes engaged in farming and other non-fishing activities),

villages with a combination of both fisher and non-fisher castes with either of them forming the majority of households in different cases. From a revenue point of view, a village is the smallest area of habitation with a definite surveyed boundary; officially recognized as a separate administrative unit and may have one or more hamlets. Known as a revenue village, this is considered as the lowest administrative unit for all purposes regarding civil and judicial administration.

Table 6.1: Layout of institutional arrangements related to Chilika Lagoon across scales and levels

Scale and Levels	**CLUSTERS OF INSTITUTIONS**			
	Government	**Non-government**	**Academic and Research (public and private)**	**Others (Media Judiciary Political parties, etc.)**
International	World Bank; Danish Embassy - New Delhi	Wetland International - Ramsar site; Japan funding and technical support; Ramsar Centre-Japan; JFGE-Japan; JAICA (Japan Aid Agency)	University of Manitoba; James Cook University; Tokyo University; University of Georgia; Several other universities	Amnesty International; National Geographic; Star Alliance; International Media; International Collective in Support of Fish Workers (ICSF); World Forum of Fish-Harvesters and Fish-workers
National / Country	Planning commission; Finance Commissions; FISCOFED; Ministry of Environment and Forest; Ministry of Water Resources; Ministry of Agriculture; National Bank for Agriculture and Rural Development; Department of Cooperatives; Aquaculture Authority of India	Center for Science and Environment; Several other NGOs	Central Water and Power Research Station (CWPRS); National Institute of Oceanography (NIO; Goa); Botanical Survey of India; Central Institute of Brackish-water Aquaculture (Chennai); Bombay Natural History Society; Several other Universities	Supreme Court of India; National Media; National Fish-workers Forum

	under the Ministry of Agriculture; Department of Wildlife; Department of Animal Husbandry, Dairying & Fisheries			
State	Chilika Development Authority (CDA); FISHFED; Department of Fisheries and Animal Resources; Department of Agriculture; Department of Revenue; Department of Forest and Environment; Department of Wildlife; Department of Soil Conservation; Department of Water Resources; Department of Tourism; Department of Labour; Department of Rural Development and Panchayati Raj; Department of Marine Resources; Odisha Tourism Development Corporation (OTDC); Department of Home; State level and District level Aquaculture Committee;	Wild Odisha; Pallishree; Centre for Environment Education; Campaign for Conservation of Chilika Lagoon; Chilika Matsyajibi Mahasangh (Fisher Federation); Central Fishermen Cooperative Marketing Society (CFCMS); Chilika Banchao Andolan (Save Chilika Movement)	Utkal University; Remote Sensing Application Centre ; Botanical Survey of India; State Pollution Control Board; Central Inland Fishery Research Institute; Central Institute of Brackish-water Aquaculture (Puri); Nabakrushna Chowdhury Center for Development Studies (NCDS); Regional Research Laboratory	High Court of Odisha; Political Parties; Aquaculture Owners' Association; State Media
Chilika Region / District	Revenue Divisional Commissioner; District Collector; Sub-collector; Tahasildar; Revenue Inspector; District Labour Office; Block	Central Fishermen Cooperative Marketing Society (CFCMS); Caste Assembly *(Jati Panchayats)*; Chilika Matsyajibi Mahasangh (Fisher		Hotel and Restaurant Owners' Association; Tourist Operators Association; Bus Operators Association; Taxi Operators

	Development Office; Cooperative Registrar; FISHFED Field Office	Federation); Chilika Banchao Andolan (Save Chilika Movement)		Associations
Local / Community	Watershed Committees; Self Help Groups; Self-help Co-operatives; Migratory Bird Protection Committee	Primary Fishermen Cooperative Society (PFCS); Traditional Village Institution; Wild Odisha; Pallishree; Centre for Environment Education; Campaign for Conservation of Chilika Lagoon; Self Help Groups		Village Panchayats; Boat Associations

Note: Institutions that are either dysfunctional or no more in existence have been highlighted

As it precedes the establishment of revenue villages, the customary orientation of fisher villages in Chilika has not only influenced the reorganization of village boundaries in the post-independence period but has also remained a dominant feature of how they are arranged even today. This offers an important background to any discussion on local level fishers' institutions in Chilika. **Table 6.2** lists some of the key local and Chilika level institutions with their brief profile following which each of these institutional arrangements will be separately discussed.

6.3.1.1 Traditional village institutions

Of the several institutional arrangements found in Chilika, the traditional village institutions form the core of the institutional rubric. Typically each fisher village has one traditional institution which may look innocuous in its structural disposition but these have been credited with strong normative and functional characteristics. These institutions are often as old as the village itself. Deeply rooted in the local culture and

history the traditional institutions were organized primarily around fishing activities but most of them evolved into including other aspects of village life. Therefore, traditional village institutions gradually came to exist either as specialized fisheries institutions with varying focus on other village matters or as more broad-based institutions that generally deal with various village matters with a specific focus on fisheries. Therefore, in general, the functions of these traditional institutions primarily revolved around issues related to the Lagoon and fishing activities.

Table 6.2: Local level institutional arrangement in Chilika

Name of institution	Level of formation	Who are members	Key functions	Current status
Traditional village institution	Village	All households represented by adult members	Overall village management including fishing	Exist in all villages but growing powerless to deal with issues of fisheries management
Primary Fishermen's Cooperative Societies (PFCS)	Single or combination of villages	All fishing households	All fishing related matters including fishing area lease	Exist on paper, used for annual lease but otherwise either dormant or dysfunctional
Central Fishermen's Cooperative Marketing Society (CFCMS)	All fishing villages in Chilika having PFCS	All PFCS and its members	Take bulk lease from revenue department and sub-lease to PFCS	Dissolved and powers were given to the FISHFED in 1988
Jati Panchayats or Caste Assemblies	Regional, i.e. all fishers belonging to a particular fishing caste irrespective of villages they live in	Fishing villages or fishers belonging to a particular fishing caste	All matters relating to the particular fishing caste including fishing related conflicts	Exist but with weak structure and functions
Fisher Federation	At the level of the Lagoon	All fisher villages in Chilika	Front organization of the fishers: think tank and political voice, conflict resolution	Divided into five groups based on caste and location of villages
Village Panchayat	One or more revenue villages	All households of the member villages	Panchayat level decision-making on all matters	Functional with election every five years

The structure of traditional village institutions included all households represented by adult members; either the village headman or a council of elders provided leadership. Though there were broad similarities, the institutions differed with regard to the finer details of membership composition and structural layout. On a normative plane, all traditional institutions were involved in making rules not only for overall village governance but also for the management of fishery resources. In these predominantly fisher caste villages, rules regarding general village life were very much linked to the relationship of people to the Lagoon. **Table 6.3** shows various types of fishing related norms and rules that were made and implemented by the traditional village institutions, some of which were in operation until about a decade back; glimpses of these rules are even seen today in a few fisher villages around Chilika. These norms and rules addressed areas related to both fishing behaviour and fishing actions thereby offering an orientation to the fishers to engage in responsible fishing. The functional responsibilities of traditional village institutions pertained to the implementation of rules for day to day village governance; functions with regard to fishing broadly included implementation of fishing related rules and dealing with deviations from these. Following is a brief account of the structural, normative and functional aspects of traditional village institutions in both study villages.

In Berhampur, a single traditional village institution was in-charge of the overall village management. However, because of its large fisher population and two different fishing areas, the entire village was divided into two groups under two sets of leaders. Created specifically for fishing related activities, these two groups were known as the big group *(Bada dala)* and the small group *(Sana dala)* based on their membership size.

However, all fishing-related norms and rules of operation were made by the council of elders under the traditional village institution were uniformly applied to both groups. These rules were opertionalised to ensure that the groups engaged in fishing activities without serious contestations or conflicts.

Table 6.3: Fishing related norms and rules followed by traditional village institutions

Areas of rule making	Nature of village norms and rules
No fishing on specific days of the year	• *Ekadashi* - eleventh lunar day of a fortnight in the lunar month. There are more than 24 "Ekadashis" in a year • *Sankranti* - Transmigration of the Sun from one "Rāshi" (zodiac in Indian astrology) to the other. There are 12 *Sankrantis* in a year • Major festival days during the year • Day on which someone dies and on the 10th, 11th, 12th day of the death • Days on which someone in the village is getting married
Restrictions on fishing gear	• Different gears for different types of fishing
Strict seasonality of fishing	• Shrimp in summer, fish in winter and crabs in rainy season • Fishing areas and fish species were declared as restricted to ensure seasonality
Distribution of fishing locations and fish species	• Assigning areas to village groups to fish in different locations and prescribing the species (shrimp or fish) they could catch on that particular day (similar to *padu* system in South India and Sri Lanka)
Management related	• Fixed days for meetings of village traditional fishery institutions • Resolution of conflicts in the village or at the caste assembly

With the passage of time, however, these two groups separated out and have emerged as two different institutions that are now largely based on political party lines and they manage their own fishing areas with rules that each of them make for their respective groups. The interesting aspect of this multi-institutional arrangement in Berhampur is the latent presence of the concept of a single traditional village institution whereby the two largely conflicting groups come together at least once a year to rotate

the fishing areas between them[43]. Other occasions when they come together include village functions (both religious and cultural) including matters linked to the village temple, dealings with government departments including annual lease of fishing areas, and conflicts involving both the groups or between Berhampur village and outside villages.

In Badakul village, based on its small size, a council of elders was responsible for the traditional village institution which consists of all households as its members and represented by their adults. Office bearers such as a village headman *(Grama Mukhiaa)*, record keeper *(Malika)* and convener *(Dakuaa)* were appointed to assist the council of elders. This institution was in-charge of overall village management including matters related to the fishery.

6.3.1.2 Primary Fishermen's Cooperative Society (PFCS)

Chilika Lagoon was handed over to the government of Odisha by the then king of Parikuda[44] in 1953 following which the government started the system of fishing area leases to villages. During 1956 - 1959 it appointed a fisher leader (known as leader *Bahania*) who received the lease from the "anchal adhikari" on behalf of the village and remained responsible for effective management of the specific fishing area[45]. By 1959 a total of 22 Primary Fishermen's Cooperative Societies (PFCS) were organized involving

[43] Rotation of fishing area in Berhampur is similar to the *Padu* system found in some of the South Indian lagoon fisheries (Coulthard 2008; Lobe and Berkes 2004) and Sri Lanka (Amarasinghe *et al*. 1997).
[44] The process of handing over of Chilika from king to the state has been discussed in detail in Chapter 3.
[45] Lease was given to the leader *bahania* because in the judgement of the government there were no institutions at the village level which could take lease until cooperative were organized. Such a step proved that there was no recognition of the traditional village institutions by the government.

41 fisher villages of Chilika and the government started giving fishing area leases to these village cooperatives. The PFCS were organized under the Odisha Cooperative Societies Act of 1951 which thereby formed the basis of first legal institutional arrangement in Chilika fisher villages[46]. The structure, rules and functions of the PFCSs were prescribed under the cooperative act **(Table 6.4)** thereby a uniform village institutional arrangement was put in place across fisher villages in Chilika. However, leaning towards the rich practice of traditional village institutions the fisher villages continued to retain most of their rules and functions even under the cooperative structure.

Two major shifts were observed with the move from traditional village institutions to the PFCSs: 1) the sphere of the institution moved outside the village boundary as two or more fisher villages were combined to form a PFCS; and 2;) the individual fisher villages continued to retain the influence of their traditional village institutions over fishery related activities which led to the establishment of sort of parallel fisheries institutions at the local level. Thus, in effect, while villages under a single PFCS worked together as a cooperative institution that received the lease of for a fishing area from the government (i.e. acting outside the sphere of village boundary), they reverted back to their respective traditional village institutions for management and use of the

[46] The first Cooperative Society was organised in 1873 under the leadership of Utkal Gaurav Madhusan Das at Cuttack. Till the formation of a separate state of Odisha in 1936 the Coop. Societies were regulated by Bihar-Odisha Cooperative Act. After Independence "The Odisha Cooperative Societies Act" 1951 was enacted and this substituted OCS Act 1962 with major amendments in 1991 and 1996. The Odisha Self-Help Cooperative Act 2001 has been enacted in 2002 to foster Cooperative Societies as self -help and democratically managed business enterprises. This new enactment shall be a milestone in the Cooperative movement in Odisha since it will give wide scope to the Cooperatives to be self relevant to meet the emerging challenges eliminating the interference of the Government.

leased area (i.e. acting within the sphere of traditional village boundary) after acquiring their share of the fishing area.

Table 6.4: Key provisions of the Odisha Self-help Cooperative Act 2001

Subject areas	Key provisions
Registration of a new Cooperation	• Not less than ten individuals, each being members of different families, and society registered under the Cooperative Societies Act 1951 intend to convert itself into a Cooperative under this Act may intend to form a Cooperative • Submission of articles of association and memorandum of association
Membership	• Any person who needs the services of a cooperative, expresses willingness to accept the responsibilities of membership, meets such other conditions as may be specified in the articles of association of the cooperative may be admitted as a member
Management	• An elected board of directors for every Cooperative constituted and entrusted with the direction of the affairs of the Cooperative
Finance	• A Cooperative may mobilise funds in the shape of equity capital, deposits and loans from its members • A Cooperative may raise funds and other forms of financial support such as guarantee form non-members, including banks, other financial and non-financial institutions
Accountability	• Every Cooperative shall keep, at its registered office, at least nine different types of accounts, records and documents as specified in the act • Every Cooperative shall keep the books of account and other records for inspection by any director during business hours • Every Cooperative shall make available during its business hours to any member who so requests, copies of this Act, articles of association, minutes book of the general body, voters' list and other accounts and records of transactions
Offences	• A person who makes or assists in making a report, return, notice or other document required in this Act to be sent to the Registrar or to any other person which contains an untrue statement or misleading facts shall be guilty of an offence • Every person who, without reasonable cause, contravenes a provision of this Act shall be guilty of an offence
Disputes	• Notwithstanding anything contained in any other law for the time being in force, if any dispute touching the constitution, management, or business of cooperative arises, such dispute shall be referred to the concerned arbitral tribunal
Dissolution	• A Cooperative may, by a special resolution, move for its own dissolution provided that a notice of the general body meeting shall be sent by registered post with an invitation to attend such meeting to the Registrar, the creditors, and other affiliated institutions and individuals
Miscellaneous	• The Government may, by notification in the official gazette, exempt or remit in respect of any cooperative or class of cooperatives the stamp duty chargeable under any law and any fee payable under any law • The Government may, by notification, exempt any class of cooperatives from taxes on - (a) agricultural income; (b) sale or purchase of goods; or (c) professions, trades, calling and employment

6.3.1.3 Central Fishermen's Cooperative Marketing Society (CFCMS)

Soon after the transfer of Chilika from the king, the state government realized that dealing with the complex access and rights system with regard to the village specific customary fishing areas was not an easy task. The distribution of leases became all the more difficult as Chilika was never surveyed therefore there was no systematic written record of rights regarding which area belonged to what village, and whatever records existed were misplaced during the transition from the King to the state government. Partly for this reason and also because of the influence of the larger cooperative movement that supported a multi-layer cooperative structure, a Central Fishermen Cooperative Marketing Society (CFCMS) was created in 1959 with all the PFCSs as its primary members. **Table 6.5** on the structure of the CFCMS shows that the central cooperative had 10 out of 13 boards of governors from the PFCSs and thereby helped the fishers to retain a lot of influence on how fishery resources in the Lagoon should be managed. The main function of the CFCMS was to manage the lease of Chilika fishing sources, i.e. receive the bulk lease from the revenue department, distribute fishing areas to PFCSs through written lease agreements, collect lease fees from PFCSs and deposit the total lease fees with the revenue department.

Table 6.5: Structure and functions of the CFCMS

Levels of representation	Number of members from each level (Total 13 Board of Directors)
Village	Ten members from the Primary Fishermen's Cooperative Societies
District	Three District Collectors (with whose jurisdiction Chilika comes)
Others	Director, Fishery Department as the Ex-Officio President of CFCMS

6.3.1.4 Caste assembly

Jati Panchayats or caste assemblies were another prominent institutional arrangement created by specific caste groups for their overall development. All the five fisher castes in Chilika have specific *Jati Panchayats*. Since these are caste based institutions they are not limited by any geographical boundary. Rather, anyone belonging to a particular caste automatically becomes a member of that *Jati Panchayat.* Structurally, the *Jati Panchayats* included one member from each of the villages where people of that particular caste reside, and also a number of selected / elected office bearers such as a Mukhia (President), Secretary, Maliaka, Tahala, Cashier, Dakua, Behera who performed different roles and responsibilities (**Table 6.6**). Over the years the *Jati Panchayats* have been able to develop an elaborate rule system through which they manage various issues linked to their caste members.

Table 6.6: Roles and responsibilities of various office bearers in caste assemblies

Office bearers	Key roles
Mukhia	President of the assembly and its main leader
Sachiba	Secretary of the assembly and maintains the proceedings
Malika	Assistant Secretary who takes charge in the absence of the Secretary
Tahala	Public relations in-charge
Cashier	In-charge of finance and maintains books of records
Dakua	Messenger – main responsibility is to inform the members
Behera	In charge of guests and visitors to the caste assemble and cooks food at meetings

6.3.1.5 Chilika Matsyajibi Mahasangh (Chilika Fisher Federation)

The Chilika *Matsyajibi Mahasangh* (CMM) is an umbrella organisation of fishers in Chilika. All fisher villages are primary members of CMM which are represented by their village leaders. The origin of the CMM dates back to the late 1950's when fisher villages had a chance to interact on a regular basis through the CFCMS at Balugaon.

There were also issues around fishing area leases which the fisher villages occasionally took up as an informal group. During that time the need to have a formal structure from the CMM was not felt by the fisher leaders because the CFCMS fulfilled this requirement as the apex cooperative institution. At times of need it also acted as the front organisation of the fishers to represent their issues at different levels of government. However, there were two developments which made it necessary for the CMM to emerge as a more formal apex organisation of the fishers. First, the dissolution of the CFCMS in 1991 and the transfer of its responsibilities to the FISHFED brought an end to the existing structure of the fishers' apex organisation. Second, starting in the late 1980's Chilika came under heavy pressure for potential tiger shrimp production which gave rise to serious problems of encroachment into fishers' rights and fishing areas by powerful higher castes and outsiders. To deal with such issues on a regular basis the CMM began to consolidate its position and finally emerged as a formal fisher apex organisation in 1991 and led a successful protest movement against the Tata Integrated Shrimp Project (For details see Chapter 3).

The CMM's structure included a general body consisting of all caste-based fisher villages and an Executive Committee elected by the members whose numbers vary from time to time. With growing instances of shrimp aquaculture in Chilika, CMM became a lead organization of the fishers and took on several issues on behalf of the fishers villages. However, politicization became intense in Chilika starting in the mid-1990s which put a dent on the unity of the fishers and also their institutions including the CMM. Differences based on caste and geo-political locations became strongly visible. Moreover, the political affiliations of different fisher villages became an important factor

contributing to discomfort and disagreements within the CMM. While there was unanimous agreement among its members on the question of opposing shrimp aquaculture in Chilika, CMM members could not come to an agreement on the issue of the new mouth as member villages on the outer channel (those that are close to the sea where the mouth was opened) stood in opposition while villages on the south and north end of the deeper Chilika favoured the opening of the new mouth. Several such factors gradually destabilized the CMM giving rise to internal conflicts. Slowly, smaller groups within the CMM started to break away and formed their own smaller federations. **Figure 6.1** shows a timeline of emerging factions within the CMM which had a total of seven break-away groups as of 2010.

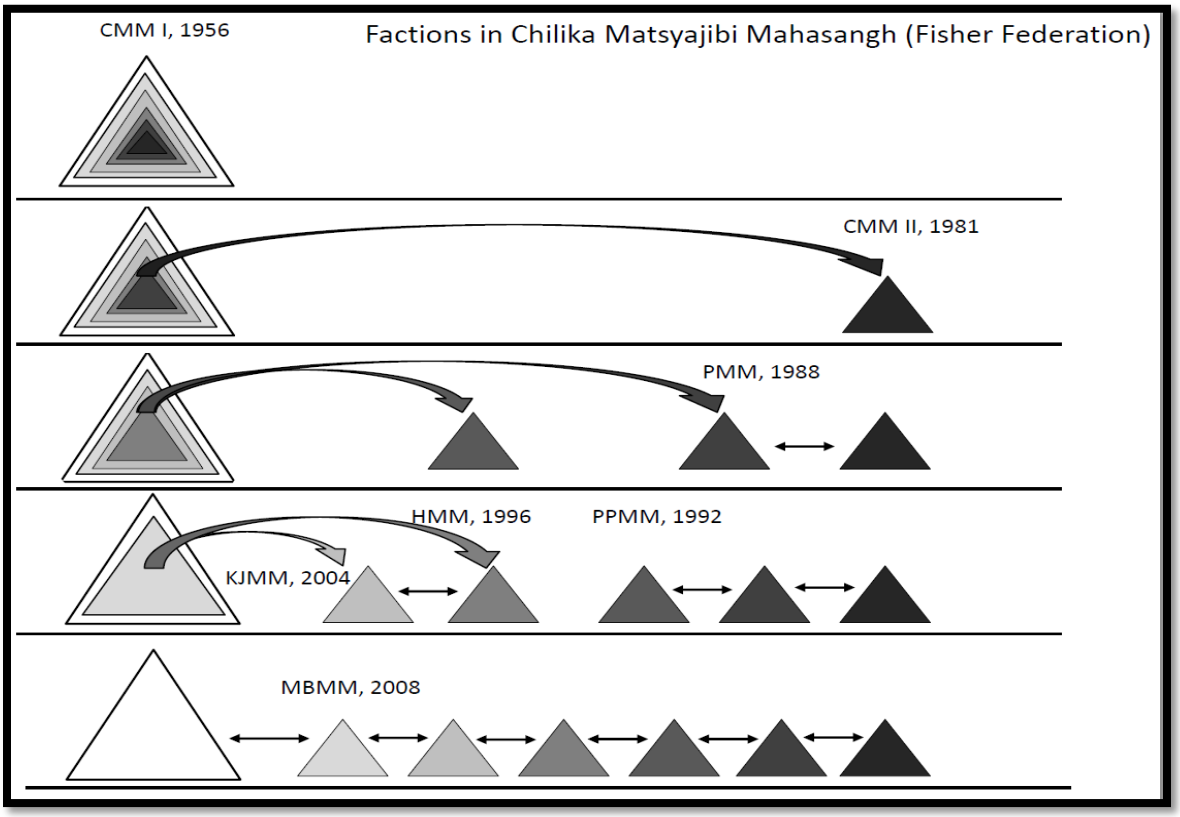

Figure 6.1: Institutional processes regarding CMM and emerging factions

Note: Chilika Matsyjibi Mahasangha I (CMM I); Chilika Matsyajibi Mahasangha II (CMM II); Purbanchala Matsyajibi Mahasangha (PMM); Paramparika Matsyajibi Mahasangha (PPMM); Harijana Matsyajibi Mahasangaha (HMM); Kalijai Janoa Matsyajibi Mahasangha (KJMM); Maa Bhagabati Matsyajibi Mahasangha (MBMM)

6.3.2 State level

6.3.2.1 A number of government departments

Table 6.1 indicated that the largest concentration of institutions is at the state level. Most of these institutions are government organisations that have either direct or indirect responsibilities regarding Chilika. From the point of view of their involvement, government organisations can be divided into four groups: 1) departments that have a direct responsibility in Chilika-related matters (example: revenue department responsible for annual lease of fishing areas); 2) departments that are indirectly involved in the matters of Chilika Lagoon (example: department of agriculture and department of water resources dealing with their respective issues in the Chilika area); 3) departments that have a specialized responsibility in Chilika-related matters (example: Chilika Development Authority with overall Lagoon responsibility, Department of Forest and Environment responsible for Lagoon conservation, Department of Wildlife for Sanctuary Management, Tourism Development Corporation with a focus on Lagoon tourism); 4) departments that are more focused on the sea or marine system but have jurisdiction over parts of the Lagoon because of its physical linkages with the Bay of Bengal (example: Department of Marine Resources which administers the Lagoon side of the sea mouth area).

While it is convenient to understand the nature of involvement of these government institutions by separating them into groups, there are distinct overlaps among these categories. Based on their activities in Chilika (**Table 6.7**), many of these government institutions will easily fit into more than one of the four groups. However, the point of focus is both on the total number government departments with varying degrees of responsibility in the Lagoon and, to a great extent, their overlapping jurisdictions. In the absence of proper inter-departmental coordination, this has resulted in operational and management related confusion. The fact that these departments draw their administrative powers from different pieces of legislation (**Table 6.7)** often makes coordination rather impossible and brings the interdepartmental power dynamics to the forefront.

6.3.2.2 Two key state government institutions

Two developments with regard to government institution-building in the early 1990's were considered important landmarks in the erosion of the institutional base for commons management in Chilika (See Chapter 3 for changes in institutional hierarchies and Chapter 4 for key factors for decommonisation in Chilika). First, in 1991, FISHFED was created as the apex organization of all the fishers' cooperatives in the state, including Chilika. This institution replaced the CFCMS (the apex cooperative of Chilika fishers) which, being a local institution, was able to function in close collaboration with village level fishers' cooperatives. In contrast, the creation of FISHFED at the state level took away the locus of decision-making control from the local fishers and gave it to a centralized administrative (See details in Chapters 3 and 4). This severed any direct linkages between the Chilika fishery institutions and the state revenue department.

Table 6.7: Government departments, nature of jurisdiction in Chilika and the legal Acts they follow

Ministries and departments	Nature of jurisdiction	Acts, Laws, Rules and Policies
Cooperation Department Directorate of Registrar of Cooperative Societies Director of Cooperation in Fisheries	Registration of new cooperatives, monitoring of existing cooperatives, dealing with offences and disputes, undertaking annual audit of books of records of all cooperative societies	Odisha Self-help Cooperative Act 2001
Coastal Aquaculture Authority	Regulation of activities connected with coastal aquaculture in coastal areas Take measures necessary for regulation of coastal aquaculture by prescribing guidelines, to ensure that coastal aquaculture does not cause any detriment to the coastal environment and implement the concept of responsible coastal aquaculture to protect the livelihood of various sections of people living in the coastal areas	Coastal Aquaculture Authority Act 2005 Coastal Aquaculture Authority Rules, 2005 Coastal Aquaculture Authority Guidelines
Wildlife Forest and Environment	Protecting, propagating and developing wildlife including birds, fish, dolphins and its environment, managing Nalabana Bird Sanctuary	Indian Wildlife Protection Act, 1972
Departments authorized by Central Government	Prevention, control, and abatement of environmental pollution	Environmental Protection Act, 1986
Forest and Environment	Conservation of forest areas adjacent to the Lagoon through implementation of laws	Forest (Conservation) Act, 1980
Central and State Pollution Control Boards Water Resources	Prevention and control of water Pollution in India	Water Act, 1974 National Water Policy, 2002
Environment and Forests National Coastal Zone Management Authority	Impose restrictions on prohibited activities within the coastal regulation zone	Coastal Regulation Zone Notification, 1991
Forest and Environment National Biodiversity Authority	Ensuring conservation of biological diversity and their sustainable use	The Biological Diversity Act, 2003
CDA Revenue Administration Fisheries and Animal Resources (FISHFED)	Regulation of fishing and other activities including fishing area lease in Chilika Lagoon	Fishing in Chilika (Regulation) Bill 2002
Fisheries and Animal Resources	Regulation and registration of boats playing inside Chilika Lagoon for fishing purposes	Odisha Marine Fishing Regulation Act 1982
Inland Water Transportation	Regulation and registration of boats playing inside Chilika Lagoon for tourism	Odisha Boat Rules 2004
Revenue Administration (through District Collectors)	Eviction of encroachment, leasing of water bodies for fishing activities	Odisha Prevention of Land Encroachment Act 1972
Revenue Administration	Extraction of minor minerals such as lime shells, silt, etc.	Odisha Minor Mineral Concession Rules 2004

Second, the creation of CDA in 1992 as the nodal institution to manage Chilika added to the confusion (See Chapters 3 and 4) by creating additional power structures which, on the one hand, conflicted with the existing government departments and their jurisdiction in Chilika, and resulted in the complete neglect of village and regional level fisheries institutions by denying them any share in the decision-making process concerning Chilika, on the other. However, the role of the CDA in the management of Chilika has continuously been questioned not only by the local fishers and civil society organizations, but recently in the State Auditor General's report which identified irregularities such as fund mismanagement, improper planning, and inaction against encroachment and illegal shrimp aquaculture farms by CDA. Paradoxically, it also recommended for larger financial and administrative powers for the CDA as a way to improve its operations. **Table 6.8** gives key details of the Auditor General's report.

6.3.2.3 Other institutions at the state level

The other institutions at the state level include non-governmental organisations, academic and research institutions, and a host of others at the level of the judiciary, politics and the media. Non-governmental organisations (NGO) working in Chilika are not generally as influential as is the case for other resource sectors in Odisha, especially forests (Interviews with NGOs and funding agencies in Bhubaneswar). For example, there is a strong NGO and civil society movement around forests and mining issues in the state. In the case of Chilika, there have been strong civil society movements such as the Chilika Banchao Andolan (Save Chilika Movement) which took leadership at the time when the state government handed over parts of Chilika to Tata Company (See Chapter 3). However, such movements have often died out once the issue became dormant which

implies that there are informal institutional arrangements which appeared and disappeared with specific issues around the Lagoon. There are, however, permanent NGOs that work with local fishers on different issues around the Lagoon. The judiciary is yet another institution that has played a key role in providing direction to the management of Chilika Lagoon through court orders. The Odisha State High Court order banning shrimp aquaculture in the Lagoon was considered a major institutional intervention that upheld the customary rights of the fishers. The support of political parties at the state level, more prominently the support of the CPI (M) for the fishers on the sea mouth issue, was considered by the fishers to be critical institutional supports.

Table 6.8: Key observations in the Auditor General's Report on CDA's role in Chilika

Areas of review	Specific observations
Funds allocation and expenditure	• Non-utilisation of funds • Irregular diversion of funds towards establishment expenditure • Non-utilisation of money collected out of ferry services
Programme implementation	• Absence of perspective plans and actions plans for the activities undertaken • Funds for multidisciplinary and multidimensional activities for preservation and restoration of the Lagoon were used for standalone activities • No action plan for economical disposal of dredged minor mineral materials • No action plan to address the adverse impacts of the dredged sea mouth on biodiversity. No disaster management plan exist to tackle possible adverse effects of artificial opening of the mouth
Treatment of catchment areas	• Wasteful expenditure of 21 million rupees due to failure of plantation • Improper maintenance of plantation journal / muster rolls – complete details of plantation labour charges not maintained • Forest department norms were not followed in undertaking the plantation
Conservation of biodiversity and genetic resources	• Total indifference of district administration to evict shrimp aquaculture "gherries" in the Lagoon • Ecological restoration work was limited to the bird sanctuary area only (not other ecologically critical areas of the Lagoon) • Illegal fishing and boating activities in dolphin habitation areas
Under utilisation of assets	• Under utilisation of existing ferry crafts • Non utilisation of survey and patrolling boats after construction
Regulatory issues	• Illegal fishing activities going on unabatedly • Unauthorised playing of tourist boats • Absence of a proper legal framework for CDA and to manage the Lagoon • Monitoring mechanisms though in place largely remained non-functional

Thus, two trends in institution building were observed at the state level: 1) creation of institutions that had specific focus on Chilika only, like the CDA, and 2) creation of another set of institutions that dealt with matters of Chilika as part of their overall responsibilities such as the FISHFED.

6.3.3 National and international levels

A number of government institutions at the national level are higher level organisations (Ministries and Directorates) of the same departments found at the State level. Consequently, a number of state level bureaucratic organizations look up to the national level for leadership and direction with less and less downward accountability to the lower level institutions. Other than the government organisations, the Supreme Court of India played an influential role in 1996 by completely banning shrimp aquaculture in the Lagoon. Moreover, on the basis of a recommendation of the Supreme Court of India, the Government of India constituted the National Aquaculture Authority under the Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries to regulate the activities connected with aquaculture in coastal areas. Accordingly, the Government of Odisha also constituted state and district level aquaculture committees.

With regard to research, the Central Water and Power Research Station (CWPRS), a central government research institution, conducted a final study to conclude that the salinity flux and tidal flux into the Lagoon would not improve unless the location of the opening of the inlet (sea mouth) was brought closer to the Lagoon. Therefore, the CWPRS played a critical role in deciding the location of the new sea mouth which later caused numerous ecological and social-economic problems in Chilika Lagoon. After the

opening of the new sea mouth, an environmental impact assessment was carried out by the National Institute of Oceanography (NIO) and it took the responsibility for monitoring the salinity gradient in the Lagoon. Thus, these national level organisations technically endorsed the decision of the state government and CDA to create the new sea mouth without much consultation locally.

Internationally, several institutions have remained involved in Chilika among which the Ramsar Convention, Wetland International, Ramsar Centre Japan, Japan Fund for Global Environment (JFGE) and the World Bank have primarily worked with the national and state governments either through funding or technical / research support. However, a number of other national and international organisations such as the International Collective in Support of Fish Workers (ICSF), media groups and Amnesty International have also played an active role in Chilika from time to time. Their role, however, has been limited to advocacy in support of the issues facing the fishers in Chilika.

Table 6.1 details the number and types of national and international institutions that are either directly or indirectly have a role in the management of Chilika Lagoon. One key difference between the national and international institutions is that the former are involved mostly in administrative and legislative matters whereas the latter played a greater role in funding and research support. However, several national level organizations, such as the National Finance Commission and Ministry of Environment and Forest have also provided funding for the management of Chilika.

6.4 Understanding the "Institutional Mess" in Chilika

6.4.1 Incapacitation and elimination of local level institutions

The Chilika case shows an overall increase in the number of institutions involved in governance over the last two decades. These institutions fall into several categories such as government, quasi-government, non-government, private and community owned, and span multiple horizontal and vertical scales. However, while their numbers have increased not all the institutions have gained the required autonomy and authority to function as independent entities. The analysis shows an uneven growth in institutional arrangements in the context of Chilika whereby some of the institutions have gained excess authority and power at the cost of other institutions. Specifically, higher level government institutions have become powerful either by taking over existing power structures or creating new levels of authority for themselves. In the process there has been large-scale incapacitation and, in certain cases, even elimination of lower level institutions.

An institutional analysis of Chilika suggests that the incapacitation of local institutions happened in several ways. The study found that fishery institutions in Chilika have evolved over a long period of time and are specifically tied to the resource and its status (discussed in Table 3.1, Chapter 3), and the nature of fishing activities that the resource can sustain (Sekhar 2004; Nayak and Berkes 2010). Such a close link between the resource and the institutions suggests that the very survival of fishery institutions would be dependent on the status of the Lagoon itself. In 1970, an area of 1553 ha of the Lagoon fishing grounds was withdrawn from four *Tiara* caste villages in Banapur region and the same area was declared a sanctuary (restricted area). This break in the link

between customary fishing area and the village resulted in the loss of functional capacity of the village fishery institution. Moreover, the continuous degradation of the Lagoon ecosystem through the impacts of two major drivers, i.e. shrimp aquaculture and the new sea mouth, radically changed the condition of the resource with serious impacts on fishers' livelihoods. The condition of the resource and loss of fishery-based livelihoods (Chapter 5) have led to the weakening of these institutional arrangements contributing to both their incapacitation and elimination.

Owing to the livelihoods crisis (Chapter 5), increased out-migration has led to a physical disconnect between fishers and the Lagoon, which has accelerated the process of institutional redundancy. In Berhampur and Badakul villages, the PFCSs are dysfunctional and traditional village fishery institutions struggle because of stagnant and ineffectual leadership. The pool of potential leaders has dwindled due to population loss and because many returned migrants are no longer interested in participating in village affairs (Robson and Nayak 2010). **Table 6.9** shows that just 11 of the 140 surveyed villages had properly functioning fisheries institutions, which highlight how dependent commons institutions are on both the health of the resource and the "togetherness" of the users responsible for crafting them.

Table 6.9: Status of commons institutions (includes village cooperatives)

Current status	Number of village institutions
Functional	11
Dormant	122
Dysfunctional	3
Do not exist	4

The elimination of institutions has resulted in either complete eradication of certain institutions or putting them on a pathway towards closing down. In 1991, the Central Fishermen's Cooperative Marketing Society (CFCMS), which was the apex body of all PFCSs, was dissolved by the government and replaced with a state level bureaucratic institution called the FISHFED. This shifted the locus of decision-making from the villages and Chilika as a region to the state capital in Bhubaneswar. With the elimination of the CFCMS, many of the PFCSs now exist on paper alone, used only to secure the fishing area lease but are no longer performing any of their traditional duties. Several other institutions had a similar fate to the PFCSs. Once regarded the hub of inter-community decision-making, the *Jati Panchayats* (or Caste Assemblies) have been severely weakened. Moreover, once a symbol of unity amongst Chilika fishers, the Fisher Federation is currently in crisis due to internal conflicts and division into five splinter groups. Part of the reason for why these two institutions did not survive well goes to a lack of adequate policy support and negative political party dynamics that increasingly became a part of these groups since the early 1990's.

6.4.2 Top-down institutions overwhelming bottom-up institutions

Institutional history in Chilika offers evidence of a rich tradition of diverse institutional arrangements spanning from single fisher villages to the Lagoon as a social-ecological unit. Of course, there were higher level institutions beyond the Lagoon that had existed from the King's time to the *Zamindars* to the democratic government in post-independence years. However, it is important to note that for a considerable period of time the local and regional institutions, made and run by the fishers, were able to manage the Lagoon resources in a considerably effective manner, with limited external influence,

Of course, there were conflicts and issues around resource sharing but there were also mechanisms at multiple levels to deal with them, often with a fair amount of success. There were also significant issues between these community institutions and other institutions at a higher level (mainly state run institutions such as the Revenue Department for lease and rent collection).

Much of the problem relating to institutional crisis appeared when there was an accumulation of institutions at higher levels; institutions whose numbers and authority became a formidable force in suppressing the legitimacy of existing community-level institutional arrangements. New institutions started to pile up at the higher levels and the existing institutions at that level became more powerful. While the creation of CDA and the FISHFED are examples of new institutions at higher levels, new lease policies in 1991 and the implementation of Wildlife and other Conservation Acts added extra ammunition to the armoury of both Revenue and Forest Departments. There were not only missing linkages between these institutional levels clearly distinguishable on the basis of the power and authority they hold, there was also a total lack of downward accountability (Bene and Neiland 2006) on the part of the higher level institutions.

The emerging patterns indicate the taking over of power and authority by senior level governing institutions, at the expense of local power and control. The increasing dominance of higher level institutions in the context of Chilika Lagoon is an example of how top-down institutions are overwhelming bottom-up institutions thereby gradually replacing a bottom-up process of institution building with a top-down structure. Consequently, the bottom-up link, which had emerged out of years of traditions and practice, is becoming fragile and the top-down link is consolidating its position, even

with an absence of a downward accountability. In such a situation the scope of lower level institutions to influence policies and functions of the higher level institutions is reduced. This situation in Chilika is not different from what scholars have found elsewhere. Berkes' (2006) Kerala figure regarding "cross-scale governance in Lagoon shrimp management" is a classic example of how clusters of institutions may take up a position at one particular level of the geo-political scale without having any cross-scale linkages, both vertical and horizontal. Olsson *et al.* (2007) figure representing co-management in Kristianstads Vattenrike Biosphere Reserve, Sweden prior to 1989 shows clusters of institutions at multiple levels but with a narrow focus and without any linkages beyond the scale at which the cluster exists. However, the Chilika case stands out prominently because of the really large number of institutions that exists in relation to the Lagoon as well as the absence of linkages between the institutions in each cluster and across clusters at multiple scales and levels.

Management "at all levels" (Cash *et al.* 2006) is a fundamental problem, especially in the context of scale mismatches (Cumming *et al.* 2006; Anderies *et al.* 2006). Thus, it may be useful to keep a community-based focus in the context of an increasingly globalized (i.e. multi-level) world (Berkes 2005, 2007a; Brosius *et al.* 2005). However, because of the growing complexity of the SES only focusing at the community level may not be enough. Overemphasis on community-based management runs the risk of defining issues at one level instead of many (Cash *et al.* 2006; Berkes 2006). We need to move in a bottom-up direction (Berkes 2006, 2007a) in our effort to build stronger institutions and create institutional sustainability that may be based on partnerships and networks. There is no panacea (Ostrom *et al.* 2007; Ostrom 2007) in dealing with

problems of institution building. Even though there is a general preference for building resource management institutions as a bottom-up process it may not always work well. Depending upon the context and policy environment both bottom-up and top-down processes could be useful. The key is to start building from where the foundation lies. Where there is a rich tradition of successful local level management, as in the case of Chilika, it could offer a good starting point for both building new institutions and establishing appropriate linkages between them. In this context, a bottom-up approach is the *de facto* rule. Inversely, successful government programs and institutions running them, wherever in existence, can be used to develop the process of institution building with a top-down approach, however, with adequate attention to downward accountability and cooptation.

6.4.3 Institutional vacuum in bridging functions

In the case of Chilika, the entire institutional arrangement not only looks lopsided but there are also gaps between institutions or there are missing links between institutions. There is also a large concentration of different institutions across administrative and geographical levels. However, even in the midst of such numerous institutions there seems to be an institutional vacuum in Chilika. As discussed above, the vacuum is due to the disappearance of several institutions representing different levels and also due to the absence of institutions at appropriate levels, referred to as "missing institutions" by Walker *et al.* (2009). Incapacitation of certain institutions along with missing linkages between them has also contributed to this vacuum. All of these have resulted in a problem of "institutional fit" (Folke *et al.* 1998; Young 2002) whereby there is a mismatch between ecological and social dynamics, and the institutional boundaries

deviate from the resource or ecosystem boundaries. Moreover, this has also led to problems in "institutional interplay" which allows institutions to interact both horizontally and vertically across all levels of organization (Young 2002, 2006).

The critical question is how to deal with this growing institutional vacuum and the gaps before they become pervasive? The Chilika case has already shown that networks (Carlson 2000) and partnerships, even though they had a prominent history in the Lagoon's management, have not been fully effective in dealing with the complexities and dynamics associated with resource management. Rather, these institutional arrangements have been rendered dysfunctional to varying degrees owing to intense political and bureaucratic pressures, and several local-regional caste, class and resource dynamics. However, it may be wrong to visualize the network and partnerships as no longer relevant to the Chilika situation as they may revert back to prominence with support from alternate forms of institutional arrangements regarding Lagoon management. There is a need to create arrangements that bridge these gaps by connecting local actors and communities with other organizational levels (Olsson *et al.* 2004).

Bridging organizations can provide strategies for managing social and policy networks and partnerships in order to deal with uncertainties in the social-ecological context (in the sense of Koppenjan and Klijn 2004). They can thereby become agents for reviving the lost institutional linkages and filling in the institutional gaps as seen in the case of Chilika. These intermediate institutions are important because they provide a package of services and facilitate other linkages (Berkes 2009), in the absence of which, existing resource management systems may end up separately engaging several "proxy" organizations, agencies, and partners to satisfy a diversity of needs (Berkes 2007b).

Even though bridging organizations can play key roles in building local institutions, creating horizontal and vertical linkages, increasing grassroots influence on policy, and disseminating new visions and institutional innovations, and create conditions for sustainable development (Brown 1991), there may not be any long-term guarantee that they will continue to do so, or that the corresponding social-political circumstances will allow them to function unhindered. The Case of Chilika is a good example to explain this process. In Chilika, there is, of course, a clear absence of bridging organizations at the present time but that was not the case historically. Institutions that were meant to play bridging roles have either taken clear hierarchical positions (CDA and FISHFED), been rendered dysfunctional (Fisher Federation), or been co-opted or disappeared (CFCMS). Institutions that are currently in a position to take up bridging roles, such as many regional, district and state level agencies including the CDA and FISHFED, do not seem to be responsive to the users and they are not downwardly accountable, both in terms of structure and function .

The situation of the current institutional crisis in Chilika Lagoon would require several bridging organizations at multiple locations across different levels. However, it may not be possible, or even logical, to create a large number of bridging organizations. Due to past experience in Chilika, there would always be an apprehension that such organizations, even if they are successfully created, would eventually take positions of power and may become instruments of further cooptation (Nayak and Berkes 2008). Considering the ephemeral nature of the bridging organizations it may be more appropriate to talk about “bridging functions” instead of “bridging organizations.” This would facilitate existing institutions in key positions to take up bridging functions as part

of their regular activities without having to create totally new organizations for this purpose. Moreover, given the complexity and uncertainty in the resource management context it may be appropriate to spread bridging functions across the institutional spectrum. While I argue in favour of a shift of focus to "bridging functions" instead of "bridging organizations", in practice, a number of bridging organizations can coexist with a good number of existing institutions taking up bridging functions simultaneously. Such an arrangement could potentially accord continuity to the importance of "bridging" as a key factor in institutional sustainability.

6.4.4 Linkages across scales and levels, scale dominance and politics of cooptation

There is a general agreement that forces or drivers at various levels of organizations often impact resource management systems (MEA 2003; Berkes 2004) including their institutions. There is also a recognized need to consider multiple levels of management (Ostrom *et al.* 1999; Young 2002; Adger 2003) with attention to cross-scale linkages (Cash *et al.* 2006). The Chilika case shows that there are several clusters of institutional arrangements that are located at different scales and levels (**Table 6.1**). However, what is important to note is the lack of linkages between institutions in different clusters as well as between institutions within a cluster. The study also observed that any such linkages, which were mostly found at the level of the Lagoon and some at the district or state levels, have been eroded to a considerable extent in recent years. Such erosions have occurred through resource conflicts and caste dynamics at the local level, and through the centralization of resource administration and changes in government policies at higher levels. This has also significantly affected linkages between the higher and the lower level management institutions, especially between the non-government or

community institutions and the government departments and ministries. Instead, most institutional linkages are observed at the higher levels of management where as lower level departmental units (such as Tahasildar, Forest Range Officer, etc.) report to their line departments (Sub-collector, Divisional Forest Officer, etc.) and receive formal instructions for day-to-day functions. Similarly, non-government or community institutions are linked to the government institutional structure only to the point where they are legally obligated to follow the provisions of the law in managing Lagoon resources. However, such relationships are often seen as one way (community to government) and characterized by a lack of downward accountability.

Since scales are a joint product of social and biophysical processes (Lebel *et al.* 2005) it is important to understand the many politics they entail. In diverse resource management contexts, different social actors constrain, create, and shift scales and levels (Cash *et al.* 2006) to serve their own interests (Swyngedouw 1997a, 1997b). Actors can change power and authority by working at different spatial levels, and they can alter the access to resources, and the decision-making processes with respect to those resources. Therefore, scale choices can be a means of exclusion and inclusion (Lebel *et al.* 2005). Scale is shaped by the understanding of actors, and is likely to be an on-going, dynamic, economic and political process (Delaney and Leithner 1997). Therefore, in our efforts at building stronger institutions and maintaining appropriate linkages between them we need to be careful of the dynamics associated with what Lebel *et al.* (2005) have termed the “politics-of-scale” by paying the attention to “politics of position” and the “politics of place”. Consequently, it is important to understand and analyse what happens to social

justice and sustainability when issues are re-scaled at progressively higher or regional levels (Hirsch 2001) without appropriate linkages.

Experience in Chilika with regard to the "politics of scale" and its implications for multi-level institutional linkages indicate a higher degree of "scale dominance" - impact of higher scale on lower scale. Berkes (2002) observes that commons literature is full of examples of the impact of the higher scale on the lower scale some of which include centralization of decision-making, shifts in systems of knowledge, nationalization of resources, influence of national and international markets, and development policies and projects.

In the case of Chilika, the problem of scale (linked to the "politics of scale") and multi-level linkages along with scale dominance has clearly resulted in the cooptation of institutional processes. Theoretically, there are many types of institutional cooptation seen in Chilika, some of which include incapacitation and elimination of institutions, breaks in the bottom-up institutional processes, and the creation of institutional vacuums. First level of cooptation occurred when traditional fisheries institutions were replaced with the PFCS in 1959; the second level of cooptation occurred with the replacement of CFCMS by FISHFED in 1991; and, the third level of cooptation occurred with the creation of the CDA which virtually brought functional death to many existing institutions, both at the government as well as community levels. **Table 6.10** outlines some of the key strategies used for institutional cooptation in Chilika Lagoon which suggest that cooptation took place in a number of ways, prominent among them being the creation of Nalabana Bird (Wildlife) Sanctuary, formalizing shrimp aquaculture, entry of

non-fishers (by caste) as formidable competitors of customary fishers, enacting Fishing in the Chilika Lake Bill.

Table 6.10: Strategies and Instruments of cooptation

Strategies for cooptation	Instruments of cooptation
Creating higher level institutions	FISHFED, CDA
Making new Acts, policies, rules and their application	Chilika Bill, Odisha Marine Fisheries Regulation Act, Wildlife Act, Environmental acts (Refer **Table 6.7**)
Extensive use of scientific research and knowledge	Sea mouth creation without consultation with village institutions
Changing practices	Capture to culture fishery Three year to one year lease system Increase in lease fees

In a complex resource management scenario such as in Chilika, we require institutional arrangements not only with attention to the "politics of scale", "scale dominance" and the "politics of cooptation," but also to designing forms of institutions with potential for cross-scale and cross-level linkages. With plenty of institutions already in place, of course with varying degrees of functionality, a true governance foundation might emerge only if political space is created for institutions across every level (Agrawal 2002; Ostrom 2005a).

6.5 Realistic Institutional Solutions Through Negotiation

In addition to the presence of a large number of institutions at the level of the government, discussions on institutional arrangements in Chilika reveal a number of issues: (1) a constant weakening of smaller-scale institutions with a number of them already dysfunctional; (2) bottom-up institutional processes overwhelmed by top-down control; (3) missing institutions and absence of linkages between existing institutions; (4) the creation of institutional vacuums and a lack of bridging functions; and, (5) breaks in

cross-linkages, scale dominance and the cooptation of institutions. How do we bring a new balance rather than a top heavy institutional network? How to achieve a more functional but equitable multi-level institutional network? The following section will deal with some of these questions by focusing on available alternatives in the institutional arrangements that could offer a way forward. In this context, I consider the alternative of polycentric governance, in the absence of which we have ended up with two very different visions of what is happening in the Lagoon leading to the paradox of marginalisation (Chapter 3). I further explore: 1) how does the discussion on institutions help us understand the livelihood crisis and 2) what are the possibilities of reconciling and balancing these two visions, before turning to the status of small-scale fishers' power and possibilities for negotiations.

A polycentric arrangement is thought to be possible because the range of institutions required is already present in the case of Chilika. Polycentric systems are characterized by multiple governing authorities at differing scales rather than a monocentric unit (Ostrom 1999). Each unit within a polycentric system exercises considerable independence to make norms and rules within a specific domain with partly overlapping jurisdictions (Ostrom 2010; Brewer 2010). Irrespective of the diversity of institutions and their hierarchical position across scales and levels, it is necessary to give due recognition to the role of every institution, may it be at the community, regional or higher government levels. However, scholars caution against possible cooptation of institutional processes (Lele 2000; Nayak and Berkes 2008), especially in situations like Chilika where a large number of higher scale formal organizations exist. In view of this, they stipulate careful attention to power dynamics and institutional politics with an

objective to strengthen the lower level institutions (Berkes 2006), which are often left to deal with powerlessness. Yet, other scholars see possibilities of enhanced mutuality and trust (Ostrom 2005b; Armitage *et al.* 2009) between institutional levels which could become a fundamental basis for polycentric institutional arrangements.

There are certainly advantages and limits associated with a fully decentralized system where all responsibilities for making decisions related to small-scale common-pool resources is localized (Ostrom 2005a). In a polycentric system, the common-pool resource user institutions will have some authority to make at least a portion of the rules related to how that particular resource will be utilized. This helps these institutions to achieve most of the advantages of utilizing local knowledge as well as the potential to learn from others who are also engaged in a similar trial-and-error learning process in parallel systems (Folke *et al.* 1998). On the other hand, problems associated with local tyrannies and inappropriate discrimination can be addressed by larger, general-purpose governmental units that are responsible for protecting the rights of all citizens and for the oversight of appropriate exercises of authority within smaller units of government (Ostrom 2005a).

Because polycentric systems have overlapping units, information about what has worked well in one setting can be transmitted to others who may try it out in their settings. When smaller units fail, there are larger systems to call upon – and vice versa (Brewer 2010). When there is only a single governing authority, policymakers have to experiment simultaneously with all of the common-pool resources within their jurisdiction with each policy change (Ostrom 2005a). Moreover, higher level institutions primarily focus on single problems, ignoring system-wide interactions (Walker *et al.*

2009). The effective presence of institutions can complement these inadequacies, and promote polycentric institutional arrangements in a bottom-up manner.

Polycentricism, in the context of Chilika, could be thought of in terms of institutions' roles in rule and decision-making, rule implementation and adjudication. Thus, it calls for an appropriate distribution of power and authority amongst all available institutions for their participation in operational, collective-choice and constitutional rule making, and their involvement in monitoring and sanctioning process (Ostrom 1999, 2007). In doing so, attention to "scale mismatches" and "scale dominance" is crucial within an institutional context, as in its absence, institutions may exceed their functional and formal jurisdictions, and end up encroaching on each others' playing fields. In such situations, polycentricism's role in facilitating greater institutional interplay in which institutions may interact horizontally, i.e., across the same level, and vertically across all levels of organization (Young 2002, 2006; Berkes 2006) is of critical importance.

From the viewpoint of formal government institutions, polycentric governance is unlikely to maintain complete independence from hierarchical arrangements, because they draw on essential legal, monetary, and physical resources from the state. Polycentricism's particular relevance to the present discussion is that it permits more flexible and opportunistic institutional design, more mutable boundaries, and less fixed and exclusive loyalties among members (Brewer 2010:289). This potentially makes an institutional arrangement better equipped to deal with complex system problems that are characterized by uncertainty and unpredictability. Polycentric governance institutions are less permanent; they may arise, reform, or dissolve in response to functional needs and do not offer the same breadth of goods or services provided by conventionally hierarchical

organizations (Brewer 2010). Thus, in Chilika, polycentricism can potentially offer a versatile institutional design that promotes institutional capacity and resiliency, maintain a rhythm between bottom-up and top-down institutional processes, mend institutional vacuum and bridge gaps, and guard against possible cooptation and scale dominance.

The discussion on institutions offers critical leads to the understanding of the paradox of marginalisation (Chapter 3) and the two conflicting visions of the situation that result from it. On the one hand, the State drew a picture of high income and increased productivity indicating that the fishers were economically well-off and the Lagoon ecosystem was healthy. In contrast, the fishers' own view of their situation painted a rather gloomy image, telling stories of deprivation and loss of fish production leading to large-scale migration. At one level, this paradox can be seen as views expressed by the two sides -- government and the fishers -- to justify their own positions. However, the institutional dimensions offer a new direction to explore the dynamics involved in the paradox.

Using the institutional dimension, it could be argued that the paradox resembles a conflict between institutions at two different levels, i.e. higher level government institutions enforcing the dominant view that "everything is well" with the Lagoon and the fishers, and the lower level village and regional institutions struggling to counter the narrative created by the government. Views of the government tend to dominate over fisher institutions that struggle to make their voices heard. Who wins in this tug of war partly depends on who has institutional power, and obviously the village and regional institutions trail behind. The government institutions have the policy and infrastructure to

support their views, whereas the claims by fisher institutions are often indiscernible and go unrecognised. For example, neoliberalism as a State policy gives weight to the vision expressed by the government, and not to the one coming from the fishers. In this context, the discussions in this chapter highlight that institutional rearrangement in Chilika need to focus on strengthening institutions at all levels, especially at the local and regional levels, so that the existence of diverse realities and multiple visions are formally recognised. This also strengthens the possibility of reconciling the two contrasting visions expressed though the paradox (Chapter 3).

Institutional analysis also provides insights into the understanding of the livelihood crisis (Chapter 5). I have already discussed that Chilika livelihood crisis was influenced by the changes in the institutional context, in addition to changes in the resource condition and political circumstances. While fishers took up several strategies to deal with livelihood crisis in terms of their income and food security, there was a serious lack of strategies to rectify the problems associated with institutional arrangements which resulted in further marginalisation of Chilika fishers. Thus, appropriate institutional arrangements are integral to the understanding and mitigation of livelihood crisis.

In the past, a diversity of local level institutional arrangements symbolised the collective strength of Chilika fishers. There is evidence (Chapter 3) that the fishers have a long history of organising against similar forces, including the Odisha State, Tata Company and higher caste aquaculture owners, to protect their interests in the Lagoon. However, in the current circumstances the small-scale fishers are less powerful than elite aquaculture owners. For development to take place in the social, economic and ecological

aspects of Chilika fishers' lives, appropriate institutions need to be put in place across different levels and linkages amongst them established. Fishers' marginalisation can be addressed by a process of empowerment of appropriate institutions can help revive fishers' collective strength to negotiate their rights with multiple contesting stakeholders.

CHAPTER 7

SUMMARY AND CONCLUSIONS[47]

7.1 Summary of Findings

Small-scale fishers throughout the world are being dispossessed of their livelihoods through the impacts of various driving forces, such as the expansion of large-scale fisheries, growth of aquaculture and protected areas, and the re-allocation of coastal resources to other uses such as urban and industrial areas, and recreation and tourism. Small-scale fishing is a large rural sector in many parts of the world, especially Asia (Kurien and Willmann 2009). It provides jobs, livelihoods, food security, and cultural identity to a large number of people. According to FAO estimates, some 90% of 38 million people recorded as fishers are classified as small-scale (Bene *et al.* 2007). Of course, many sectors of the global economy are being transformed, but the changes occurring in the small-scale fisheries sector are having major social, economic and environmental impacts, resulting in the marginalisation of small-scale fishing communities and creating environmental injustices and equity problems (Bavinck 2001; Bene 2003; Pauly 2006). Because most of these issues can be complex, persistent or recurring, often hard to define or fix in a final way due to their larger social, economic and political ramifications (Rittel and Weber 1973), some scholars argue that fisheries and coastal governance is a "wicked" problem (Jentoft and Chuenpagdee 2009; Khan and Neis 2010).

[47] Parts of this chapter, plus content from some of the later chapters, have been published as: Nayak, P. K. and F. Berkes. 2010. Whose marginalisation? Politics around environmental injustices in India's Chilika Lagoon. *Local Environment* 15 (6): 553–567.

The temporal and spatial scales of a wicked problem depend on the specific resource management context and the nature of the drivers that impact the system. Nevertheless, it is possible to identify certain key areas, addressing which could lead to a better understanding of the wicked problems and making progress towards their solution. In this light, the host of wicked problems facing the small-scale fisheries sector might best be addressed through: 1) a shift in philosophy to embrace uncertainty and complexity (Berkes 2003); 2) an appreciation of fisheries as coupled social-ecological systems and more broadly as complex adaptive systems (Berkes 2003, 2011; Mahon *et al.* 2008); 3) recognising the concerns regarding livelihood and food security (Chuenpagdee *et al.* 2005) for an ever increasing group of marginalised fishers; 4) linking values of social justice and the distribution of power to ecological sustainability (Johnson 2006; Nayak and Berkes 2010); and 5) creating a new institutional balance through more functional but equitable multi-level institutional networks (Adger 2003; Cash *et al.* 2006; Andersson and Ostrom 2008) and governance arrangements (Kooiman *et al.* 2005; Berkes 2010).

The appropriateness of these scholarly observations is supported by the findings of the study presented here (**Table 7.1**). Consistent with these observations, the thesis strives to explain the drivers, dynamics and impacts that created situations in which the "fishery began to rhyme with poverty" (Bene 2003) in the context of the Chilika Lagoon. Coastal fisheries in India have been the setting of some major struggles primarily involving small-scale and industrial fisheries since the emergence of global markets for marine products such as shrimp, and government policies for developing industrial

fisheries. In the 1970s and 1980s, conflicts between the two sectors occurred in various parts of India (Kurien 1998). Since the 1990s, the locus of conflict has shifted and involves the aquaculture industry and its expansion into areas used by small fishers. The small-scale capture fisheries of Chilika, and the large population that depends on it, have been in decline because of the expansion of aquaculture and government policies that favour that sector.

Prior to 1980, Chilika supported a capture fishery. Fishers enjoyed clear and uncontested rights and entitlements that were further strengthened through caste norms in the use and management of Lagoon resources. The rights were turned into entitlements with temporal progression and recognition by government through legal arrangements. Fishing areas allocated to fishers had clear demarcations which were village-specific and managed on the basis of commonly agreed upon boundary rules. Further, elaborate institutional arrangements at various levels provided a strong foundation for local management. A supportive government policy was in force entailing minimal interference with customary ways of using Lagoon resources.

Table 7.1: Study findings by research objective

Research Objectives	Main Findings
To account for the historical and political context and processes of change in Chilika fisheries.	Environmental change and fishers' marginalisation in Chilika are products of a long history and intense politics of which the Lagoon and its people have been a part. In the changed context fishing symbolises power. Fishing activities that used to be looked down upon in the society are now favoured by the higher castes, especially those who are engaged in fishing or aquaculture. State development interventions have failed to achieve both resource conservation and livelihood security of the fishers. Instead, the Chilika case suggests that local small-scale resource production and use systems may have the potential to create, even though on a smaller scale, conducive environment for both ecosystem maintenance and economic growth.
To analyze how access, commons rights and entitlements have	Fishery commons in Chilika was subject to the influences from political, economic and ecological domains at multiple scales. This has put Chilika commons in a constant flux. Thus, the dynamic nature and fluctuations associated with commons development in Chilika make it imperative to understand

changed historically.	commons as a process, rather than a regime fixed in space and time. Such a process associated with commons can be understood as "commonisation" and "decommonisation". The nexus between aquaculture owners and the "people in power" has proved detrimental to the process of commonisation and highly supportive to decommonisation. Chilika is a clear case in which government policies have encouraged de facto privatisation. Further, diversification of property types in Chilika has given way to the establishment of multiple or mixed property rights regimes which mutually contradict each other. There has been a sharp decrease in the rights of caste-based fishers which confirms that they have moved from being legal right-holders to a state of dispossession. A regime of customary rights of caste-based fishers has gradually changed into a state of de facto control of non-fishers in Chilika.
To analyze livelihood processes in Chilika fisher communities that is in transition to marginalization.	Livelihood crisis in Chilika has close ties with the growing ecological degradation of the Lagoon. This crisis has affected all the fisher villages in Chilika who have taken up a number of livelihood strategies. However, the outcomes of those strategies have not necessarily made fisher livelihoods sustainable. Instead, the resulting trends indicate that most of these strategies have contributed to disconnection of the fishers from the Lagoon. Out-migration has emerged as a key livelihood strategy which has already pushed one-third of the adult fishers out of fishing thereby resulting in large-scale occupational displacement. The pool of potential leaders has dwindled due to population loss and because many returned migrants are no longer interested in participating in village affairs.
To examine institutional linkages across levels of social and political organization that promote (or hinder) decision-making	There has been an overall increase in the number of institutions during the last two decades. However, not all institutions have gained the required autonomy and authority to function as independent entities. The growth of institutions in the context of Chilika was uneven whereby some have gained excess authority and power at the cost of others. The current institutional arrangements lack downward accountability, bottom-up institutional processes, appropriate cross-linkages, all of which have resulted in weak and dysfunctional institutions at the bottom levels (village and regional). Polycentric institutional arrangements, with its ability to build relationships among multiple authorities with overlapping jurisdictions, can offer a versatile design that promotes institutional capacity and resiliency, maintain a rhythm between bottom-up and top-down institutional processes, mend institutional vacuum and bridge gaps, and guard against possible cooptation and scale dominance.

In the post-1980 period, shrimp aquaculture became a major driver of change in Chilika Lagoon. A sudden boost in international shrimp markets and increase in export prices turned the wheel in favour of tiger prawn aquaculture. The development spread with great speed and intensity throughout the Lagoon. My findings indicate that four impacts of aquaculture contributed to a growing sense of marginalisation. First, an

emergent culture of encroachment developed, whereby non-fishers (and some fishers), driven by profit motives and supported by elites in the bureaucracy and political circles, took up large-scale aquaculture. In the process, they started taking over customary fishing areas that were earlier controlled by caste-based fishers and converted these into shrimp farms. The fishers soon found that the Lagoon was virtually taken over by non-fishers and the "shrimp mafia". Second, motivated by the prospects of foreign earnings through shrimp exports, there were significant changes in the government approach to the management of Chilika, reversing earlier policies. The support for traditional rights and the caste-based capture fishery was withdrawn in favour of aquaculture and the extension of rights to non-fishers. Third, developments with regard to fishing area encroachment and leases have led to issues of restricted access and entitlements. Fourth, aquaculture has led to a steady erosion of local institutions in Chilika. With the loss of fish resources, most village fisher cooperatives went out of business, or developed internal strife, and became largely non-functional.

Along with aquaculture, the newly created sea mouth (opening of the Lagoon to the sea) of Chilika became another major driver of change and marginalisation. The sea mouth normally remains functional throughout the year with daily inflow and outflow of water that follows periods of high and low tides in the Bay of Bengal, with seasonal variation in the rate of inflow and outflow. However, by the beginning of 1990s, the sea mouth was getting blocked, and the flow of sediments from the rivers into the Lagoon was not being flushed out to the Bay of Bengal, resulting in Lagoon siltation. As a response to this problem, the State Government dredged out an artificial sea mouth in 2001, creating a connection between the sea and the main basin of the Lagoon. Local

fishers viewed the new sea mouth as a mistake because it was created at a location which increased the intensity of water inflow and outflow with daily high and low tides. In contrast to the old sea mouth where the daily inflows and outflows were buffered by the presence of channels and islands, the new sea mouth, efficiently engineered to flush out sediments, allowed in too much sea water. This inadvertently resulted in ecological and livelihood impacts.

Impacts of these two drivers, aquaculture and the new sea mouth, had a profound influence on the status of household livelihoods. The livelihood crisis has had important impacts on food security, compromising the quality and quantity of food consumption. The failure of fisheries as a reliable source of livelihoods resulted in out-migration. The skills of the fishers in Chilika are primarily oriented towards Lagoon fishing, and generally they lack other skills to engage in non-fishing livelihood activities. In fact, survey results in 140 fisher villages showed that one-third of the total adult population was occupationally displaced from fishing by 2008. This was a significant change from the pre-1980 period when nearly every household in fisher villages depended on fishing, as either the only or the primary occupation. The overall result of these impacts was a deep sense of marginalisation felt by the Chilika fishers which finds expression in the section below.

7.2 Contributions of the Thesis to Theory

From a theoretical perspective, this thesis subscribes to a number of scholarly areas to analyse change and marginalisation in the context of the Chilika Lagoon. A *social-ecological system perspective* offered an overarching framework to explain the

Lagoon as a complex social-environment system that has implications for all other areas of analysis attempted in this thesis. *Political ecology* and *environmental justice* were used to understand the influence of history and politics on the changes in power structures and their implications for growing injustices and the marginalisation of fishers. *Commons* scholarship was a useful approach to explain the challenges in maintaining Lagoon commons and analysing various contributing factors and dynamics associated with the understanding of "commons as a process". The *livelihoods approach* was used to understand change from a livelihood and food security perspective, and the implications of the outcomes for fishers' disconnect from the Lagoon. The use of *institutional analysis* helped examine multilevel arrangements of social and political organizations, and its overall implications for fishers' marginalization from a decision-making and institutions point of view.

The use of these theoretical and conceptual areas was not limited to the examination of specific issues only. Rather, the influence of their analytical rigour spanned multiple issues that were under the scope of the study. This was an obvious outcome necessitated by the multidimensional nature of change in Chilika and impacts from a set of equally varied multi-level drivers. In this context, no single theoretical proposition would be sufficient to study such a wide array of complex issues which led to the use of a basket of theoretical approaches offering multiple lenses. Scholars have sufficiently challenged the presumption that it is possible to make simple, predictive models of social-ecological systems and deduce universal solutions, panaceas, to make human-environment systems sustainable over time (Ostrom *et al.* 2007). Panaceas frequently fail. Complex system problems, such as those in Chilika Lagoon, are deep

rooted and continuous, as they are shaped by uncertainty, unpredictability, change and emergent properties, and their linkages across multiple scales (Levin 1999). Their understanding requires innovative approaches that transcend disciplinary boundaries. With this backdrop, the thesis contributes to the intersection of bodies of literatures whereby issues, that would otherwise follow strict disciplinary boundaries, were analysed through multiple theoretical approaches or lenses.

Specifically, the contributions of this thesis to theory can be summarised as three items:

- **A novel approach to deal with complexity: the "triad" of factors, change-disconnection-marginalisation, as a way of making social-ecological system complexity comprehensible.** Lagoons are complex adaptive systems, but they are not "infinitely complex" (as Holling would put it, pers. comm.). Theoretically, it is possible to characterise a complex system through a condensed set of attributes (Levin 1999; Berkes *et al.* 2003). However, complexity cannot be treated as a static phenomenon in the context of highly dynamic resource regimes like Chilika. Here, the interconnections and cross-influence among the attributes become important factors that define the nature and the extent of system complexity. Impacts from external drivers act as additional factors of complexity. Using such notions, the construct of the triad (**Figure 7.1**) facilitates a diagnosis of complexity in the Chilika social-ecological system through examining the critical linkages between environmental change, human-environment disconnect and fishers' marginalisation, and impact of several external drivers across multiple scales. In a similar way, the

triad of change-disconnect-marginalisation can potentially be used as a conceptual and methodological tool to comprehend social-ecological system complexity in a variety of contexts.

- **Use of commonisation and decommonisation as a way to understand commons as a process.** A set of common-pool resources may over time come under commons institutions (commonisation) or suffer a loss of commons institutions to become open-access or become privatized (decommonisation). The notion that commons share two characteristics of excludability and subtractability (Ostrom 1990; Feeny *et al.* 1990; Ostrom *et al.* 1999) implies that they are not fixed in time and space with any one fixed regime, as seen for example in the Chilika case (Nayak and Berkes 2011). Rather, these characteristics make commons highly dynamic and subject to fluctuations. Some scholars further this argument by treating commons as complex adaptive systems and their effort is to build a commons theory that addresses critical issues of scale, uncertainty and change (Wilson 2002, 2006; Adger *et al.* 2003; Berkes 2006). Based on a categorisation of the commons scholarship into collective action and entitlement scholars, Johnson (2004) observes that there is a normative and methodological tension within the commons literature. However, the thesis (Chapter 4) recognizes that different views within commons scholarship are relevant as they provide an opportunity to explore ways to keep commons as commons in the long-run. They do so by explaining commons as a two-way process (**Figure 4.1**) that fluctuates, depending on the influences of multi-level drivers of change, between commonisation (understood as a process through which a resource gets converted into

a jointly used resource under commons institutions) and decommonisation (refers to a process through which a jointly used resource under commons institutions loses its essential characteristics).

- **Understanding marginalisation from local peoples' point of view by finding ways in which fishers express the notion we call marginalisation.** The attempt to conceptualise a more inclusive, people-oriented definition of marginalisation is a scholarly innovation in this thesis, extending the work of Narayan *et al*. (2000a, 2000b). Such a definition was possible as the thesis explored what marginalisation looked like from the local fishers' points of view. Methodologically, three levels of analysis were carried out: 1) investigating the gap between official accounts and local fishers' view of the situation as a paradox; 2) further exploring fishers' views through metaphors they used to express their marginalisation; and, 3) expanding on the list of indicators, as suggested by fishers' metaphors, which followed from a suite of interconnected environmental, social, economic, and political changes (**Table 7.2**). The fishers' points of view present a more complex, multidimensional concept of marginalisation, not simply as a state of being but as a process over time, impacting social and economic conditions, political standing, and environmental health. It is based on using the integrated social-ecological system as a unit of analysis (Berkes and Folke 1998; Berkes 2011), and the assumption that the best judge of poverty and marginalisation is the people experiencing it (Narayan *et al.* 2000a).

Table 7.2: List of fishers' indicators for change and marginalisation

A. Related to resource access and institutions
(1) Illegal shrimp aquaculture replacing capture fishery over 60% of the Lagoon fishing area (2) Increase in resource conflicts and number of court cases among fishers and non-fishers (3) Loss of fishers' access to customary fishing grounds (4) More than 90% of PFCS and Village Fisheries Institutions are inactive (5) Fishers caste assemblies have become weak (6) Divisions in the fisher federation leading to loss of political voice (7) Growing political isolation of fishers otherwise known for their activism
B. Biophysical indicators
(1) Increase in the intensity of tidal sea water flow, impacting Lagoon ecology (2) Barnacles on the Lagoon floor indicates increase in salinity, affecting both fishers and their equipments (3) Areas that used to support abundant fish now dominated by crabs (signifies change of physical location by species due to loss of habitats) (4) Changes in species composition and seasonality, with implications for food chains and fishers livelihood (5) Several commonly found fish species have become locally extinct (6) Fishers no longer see dolphin vomit, signaling lack of fish in the Lagoon (7) Reduced numbers of migratory birds and changes in congregation areas (8) Disappearance of *chari dala*, signifying loss of habitat for post-larvae shrimp
C. Social and economic indicators (outcome of multiple impacts)
(1) Disappearance of large fish and shift of the fishery to small and immature fish (2) Some fisher families eating fish twice in 4 months indicate lack of fish availability and inability of fishers to buy fish (3) Fishers eating chicken instead of fish signifies the presence of more chickens than fish in fishing villages, a shift in livelihoods (4) Reduced numbers of actual fishing days due to continuous failure of catch (5) Large-scale out-migration and shift to local wage labour mean occupational and physical displacement of fishers (6) High-interest loans leading to a vicious cycle of indebtedness and a form of social trap (7) High rates of school dropouts can potentially lead to further exclusion of fishers (8) Changes in fish taste, hinting at the growing pollution in the Lagoon and local belief that fish are unhappy

7.3 Fishers' Perspectives on Change and Marginalisation

Based on **Table 7.2** I elaborate on the fishers' perspectives of change and marginalisation in the following section. The data used to analyse the four study objectives and discussions on the outcomes allow for the construction of a suite of

interconnected indicators that fishers typically refer to express marginalisation and the associated factors of environmental change and their own disconnection from the Lagoon. **Table 7.2** is an expanded list of fishers' indicators of change with respect to resource access and institutions, biophysical factors, and social and economic factors. It is based on a general survey of 140 villages and captures consensus views of the village committee or its general assembly, with additional material from household surveys and focus groups. The results were verified by follow-up workshops. Each category of indicators is thematically linked to one or more of the four metaphors given by fishers in Chapter 1.

The list of indicators pertaining to resource access and institutions indicates the nature of fishers' marginalisation from a political and decision-making point of view. On the whole, they exemplify signs of the growing powerlessness of local fishers as they continue to be deprived of their customary access rights and get embroiled in caste and class conflicts due to the growing intensity of shrimp aquaculture. Moreover, the loss of institutions at the levels of village, regional, and caste conglomerations has further increased the political isolation of fishers. Loss of commons institutions, as part of a loss of commons access, is a phenomenon that has been noted earlier (Beck and Nesmith 2001).

The biophysical indicators explain some of the implications of ecological / environmental changes for marginalisation, thereby emphasising the importance of considering the Lagoon as a linked social-ecological system. Local indicators such as an increase in barnacles on the Lagoon floor signify a host of meanings: more salinity, less fish, physical impediments for fishing, threat to the Lagoon ecosystem as well as the local

economy. Similarly, the absence of dolphin vomit, a regular phenomenon earlier (fishers think dolphins overeat when food is plentiful), is commonly understood as lack of both fish as food for dolphins and the dolphin itself. Paradoxically, the State Government spends thousands of dollars through formal scientific studies to confirm the status of salinity, fish stock, and the number of dolphins.

Social and economic indicators explain the outcomes of multiple impacts. The list of simple indicators, as explained by Chilika fishers, helps build a more complete picture of marginalisation as it spans over a range of matters from food and fishing habits to levels of indebtedness and education. Large-scale out-migration of fishers, the existence of which has been constantly denied by the State Government, constitutes one of the most significant indicators of the bigger picture of marginalisation.

The indicators help to analyse how fishers see their own marginalisation in relation to environmental change and their own disconnection from the Lagoon – very different from the government view that economic success (or lack of it) can be measured in terms of fisheries production and market value. Moreover, the calculation of average income data falsifies the real situation of the fishers because it gives a picture based on aggregate figures and does not necessarily include the individual household level incomes. In contract to government view, fishers' list of indicators follows from the suite of interconnected environmental, social, economic, and political changes in the context of Chilika. It is based on looking at the integrated Lagoon social-ecological system as a whole (Berkes and Folke 1998), and the assumption that the best judge of poverty and marginalisation are the people experiencing it (Narayan *et al.* 2000a). It confirms that

marginalisation is not simply a state of being (e.g. a condition of low income or food insecurity) but a process over time, with several inter-related elements.

7.4 Revisiting the Change-Disconnect-Marginalisation Triad

Figure 7.1 extends the construct of the triad of change-disconnect-marginalisation (Chapter 1) by drawing insights from the analysis presented in previous chapters. It suggests that the Chilika social-ecological system was influenced by changes in its ecosystem, disconnection between the human population and the Lagoon environment, and massive marginalisation of the fishers – all of which received impacts from several external drivers, both positive and negative, across multiple scales. The changes are continuous, so also the nature of impacts from the drivers, which makes the Lagoon a complex and dynamic social-ecological system. Part of the complexity results from the two-way interaction and cross-influence between environmental change, human-environment disconnect and marginalisation in Chilika. The cyclic nature of interactions and system continuity are seen as key attributes that maintains the Lagoon SES as an ongoing process.

Several drivers actively influenced the Chilika Lagoon social-ecological system and have contributed to the processes of environmental change and marginalisation (**Figure 7.1**). Seen as natural or human-induced factors that directly or indirectly cause a change (MEA 2003), some of the drivers were biophysical in nature and others human-induced. The influence of these drivers came from different levels of social and political organisation, from local to international. Drivers with negative impacts, such as shrimp aquaculture, sea mouth and government policies, were most influential in causing change

in Chilika. These drivers were reinforced by higher level drivers, such as globalisation of shrimp markets and climate change, mostly received through the Bay of Bengal. There were drivers with positive impacts that countered the effects of the negative drivers, but the latter was far more influential in bringing long-term changes. When negative drivers tend to dominate the good effects of positive drivers it leads to emergence of wicked problems. Societies adapt to change, but in the case of Chilika, the speed of change overwhelmed the ability to respond, and there were far-reaching impacts on the social, economic, political and ecological lives of fishers (**Figure 7.1**).

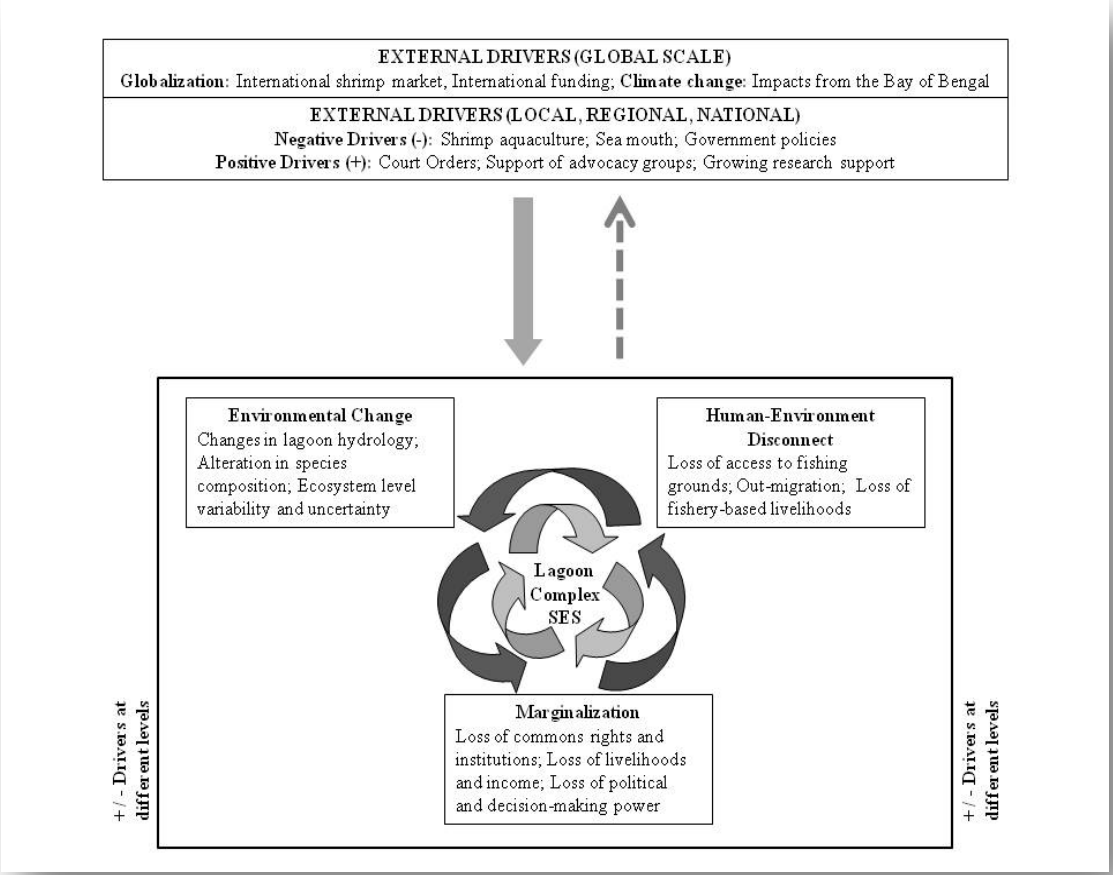

Figure 7.1: Fitting the triad of change-disconnect-marginalisation to the context of Chilika's customary caste-based fishers

Of course, there is also an opposite dimension of "change" whereby it could create new opportunities and upward social and economic mobility. However, that kind of change is related to power and authority, structural advantage and institutional favour and, in the case of Chilika, completely swung in favour of higher castes and other elite classes. Thus, while the "change" in the Chilika social-ecological system had adverse impacts on the caste-based fishers, the same change became a positive force for economic and political empowerment of the new capitalist - aquaculture owners. Thus, not only change but also its impacts are multidimensional.

7.5 Research and Policy Implications: Closing Remarks

The thesis rests on the strength of 28 months of intensive fieldwork in Chilika Lagoon, an area associated with intense resource conflict. It also uses multiple lenses of analysis by adopting a basket of theoretical approaches. This combination of theory and extensive field data take this work beyond the usual academic boundaries and makes its outcomes potentially policy relevant. Efforts were made even before the study ended (**Annexures I and II**) to catalyse for policy change, not only for the marginalized fishers but also for coastal and lagoon policies as a whole. This work creates an opportunity to link theory to practice and policy at a time when the Odisha State Government is in the process of bringing forth a law on Chilika (The Fishing in Chilika Regulation Bill). Outcomes of this research have already contributed to the development of a more pro-fisher policy, with specific attention to creating mechanisms to protect fisher rights and livelihoods in the Lagoon, and establish safeguards to strengthen the fisher-Lagoon connections on a more permanent basis. There are a number of policy implications resulting from this research which is listed below:

1. People oriented and a practical approach to the understanding of the multifaceted problems in complex social-ecological systems is a priority. Given that the realities of the resource dependant poor are diverse, often complex and dynamic, it is important to recognise that their criteria generally differ for those assumed on their behalf by others (Chambers 1995). More recent work (Narayan *et al.* 2000) also recognises the importance of using the point of view of the people themselves in defining societal problems. This thesis confirms to these ideas by generating fishers' views on their own marginalisation and the drivers that caused it. Recognizing fishers' views on marginalisation is important because it offers an alternate view of the reality; often different from how the State and its policy makers and planners would define it for them. In Chilika, generating a list of fishers' own indicators of environmental change and marginalisation challenges the government account of the situation and the resulting paradox. The results of the research suggest that the formulation and implementation of resource management policies needs to accommodate alternate views and definitions offered by local people.

2. The triad of change-disconnection-marginalisation offers a more holistic approach to problem solving. The three attributes – environmental change, human-environment disconnecting and marginalisation – function through two-way interaction processes and cross-influence. Environmental change indicates shifts in hydrological regimes, alteration in species composition, variability and uncertainties in the biophysical processes. Human-environment disconnection

refers to physical, psychological, economic and political separation of the fishers form the Lagoon that may result from events such as migration, loss of access and tenure rights, and livelihoods. Marginalisation is an overall consequence that reflects a state of being often resulting from environmental change and disconnection. The cyclic nature of interactions amongst the three attributes is a critical element of understanding the Chilika social-ecological system which has immense implications for policy. The research emphasise that a clear understanding of these attributes is a precondition for effective policies. Moreover, the triad emphasises the importance of linking people to the resource (social-ecological system perspective) as a key attribute of resource management policies because addressing only the social dimension of resource management without an understanding of resource and ecosystem dynamics will deviate from sustainable outcomes (Folke *et al.* 2005).

3. Effective policies require institutional infrastructure. Building stronger institutions can be seen as a prerequisite (Berkes 2004; Ostrom 2005) to successful Lagoon governance. Institutions connect the resource to the people (users) and formulate norms and rule to regulate their behaviour vis-a-vis the resource; they implement and monitor resource management policies and provide means to the users to exercise their tenure rights and responsibilities as a collective rather than as individuals. The emphasis is on decentralised resource management through appropriate devolution of governance responsibilities (Berkes 2010). However, the Chilika case is characterised by large-scale centralisation of decision-making and the concentration of power in higher level government institutions. This has

disenfranchised lower level, especially village and regional, institutions. In this context, the Chilika Development Authority, which could have had a coordination function and could have acted as a bridging organisation, has instead emerged as an agent of centralisation. Given the current (2010) institutional realities (Chapter 6), my research recognises polycentric governance arrangements as an alternative to deal with the problem of centralisation. Polycentric arrangements can create opportunities for a range of multilevel institutions to share power and responsibilities with regard to decision-making, rule implementation and adjudication.

4. Governance of natural resources can be seen as a process of building stronger interactions, their guiding principles and enabling institutional arrangements (Kooiman and Bavink 2005). For the success of governance of Chilika resources, fishers need to be empowered. The research recognises that the small-scale fishers of Chilika are clearly less powerful than the elite aquaculturists. However, they are not entirely and permanently powerless. There is evidence (Chapter 3) that fishers were able to successfully organise and protest the decisions of the State government to support the corporatisation of shrimp aquaculture by handing over parts of Chilika to Tata Company. They are, in fact, in a continuous struggle with the existing aquaculture farms. Fishers must be empowered through institutional and policy support to enhance their negotiation abilities.

   The scope for negotiation is a critical instrument for resource governance and the right policy can make a real difference. Chilika requires a policy environment in

which legal rights and customary livelihoods are respected. The timing may be good for a policy change: international prawn markets have stabilised and the "pink gold rush" is over. Under new policies, political space for negotiation needs to be created, and processes causing marginalisation reversed. Fishers need to be empowered to re-connect to their environment and reinvent traditions of stewardship, without which there will be no resources left to fight over. Networks and partnerships are central to this process of capacity-building and social-ecological revitalisation.

5. A process of fisher empowerment would require critical political support. In Chilika, political representation has been dominated by higher castes because of their successive electoral victories (Chapter 3). This has suppressed the political ambitions of the fishers and excluded them from the decision-making process. It is important for the fishers to find alternative ways to obtain political support. Some fishers suggested political representation based on caste criteria. Such caste-based representation is not unprecedented, and historically disadvantaged groups, including women do have such representation in India. However, caste-based representation is controversial and hence subject to being contested.

The thesis considers Chilika's sustainability to be social-ecological in nature, thereby combining key social dimensions (livelihoods and subsistence, access rights and entitlements, power and control, equity and justice, interactions and institutions) with ecosystem goods and services (MEA 2005) which include ecological processes, dynamics and outcomes. This in itself signifies a complex systems analysis and an

innovative approach to the understanding and promotion of lagoon social-ecological systems. Such an approach has tremendous potential for further policy relevant research and application. The main contribution of this thesis to research and policy is the use of social-ecological systems as the unit of analysis producing policy relevant outcomes by integrating social concerns with environmental concerns.

As with environmental change, poverty and marginalisation have many causes, and I do not wish to underestimate the complexities of poverty (Narayan *et al.* 2000a) and the multiple ways in which commons use may be lost to communities (Beck and Nesmith 2001). In the case of the Chilika Lagoon, however, two causes stand out as major drivers of change. These two drivers had differential impacts on the social-political, economic, and ecological aspects of fishers' lives. While aquaculture directly influenced access rights and commons institutions, the new sea mouth inadvertently impacted the species composition of the Lagoon and therefore fisher livelihoods. The two drivers acted synergistically, the sea mouth impact amplifying fisher livelihood disruption due to aquaculture expansion, and the two together resulted in the two major outcomes, loss of livelihoods and out-migration. The social cost of these developments has indeed been significant: the marginalisation of fishers and fisher communities, some 400,000 people out of a regional population of about 700,000. Such marginalisation cannot be measured by the very indicators that contributed to the problem in the first place – those based on regional economic production and export data. The customary fishers' point of view, and the information obtained using this point of view as a guide, presents a much richer picture of marginalisation than any official data possibly can (**Table 7.2**). This,

considering that there appears to be no government records on fisher displacement and out-migration.

The striking feature of the fishers' view of marginalisation is that, it is not simply a state of being (e.g. a condition of low income or food insecurity) but a process of change over time, with several inter-related elements (Nayak and Berkes 2010). The major elements in Chilika fishers' marginalisation includes food shortages at the household level, cycles of indebtedness with interest rates as high as 120% per annum, the selling of fishing gear and other possessions, and taking children out of school. This livelihood crisis has led to the displacement (as of 2009) of about one-third of the fisher population. About one-half of the former fishers and their wives have become local wage labourers, and the other one-half has migrated out of the region.

Proponents of aquaculture often argue that increased production helps feed the poor. In reality, much of aquaculture in this case is oriented to producing an expensive product for profit and export. In the case of shrimp aquaculture in developing countries, some 99% of the product is exported (Pattanaik 2007). Some of the social and environmental costs of the process of producing such goods accrue to the traditional fishers of the area. In effect, the transformation of an existing capture fishery into an aquaculture operation not only impacts the livelihoods and the food security of the poor, but also provides an excuse for the rich to encroach on the lands and the resources of the poor. For development to take place, these trends must be reversed.

With over 400 million people officially under the poverty line in India, the State cannot afford to be completely subservient to the forces of neoliberal development

policies. Development must be based on ethics, welfare and justice, as much as on economic forces. The State must come forward, both through its direct interventions and through civil society organisations, to reorganise its constitutionally assigned roles of being a welfare democracy. It should provide creative leadership by allowing, organizing, negotiating and enabling processes of empowerment of marginalised people and their institutions. There will be a cost if, in the 21st century, democratic India continues to neglect the concerns of about half of its population who are groaning under the pressure of unprecedented *changes*, *disconnections* and *marginalisation* in their social-ecological and political environments, just like the fishers in Chilika.


Meetings of the Fisher Federation in progress:
Larger Federation (left) and one of its factions (right)
Photo: Prateep Nayak

Pratap conducting monthly household livelihood monitoring
Photo: Prateep Nayak

Village Committee members of Badakul sharing village level records
Photo: Prateep Nayak

A focus group meeting with women fishers of Berhampur village
Photo: Prateep Nayak

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ANNEXURE I

THE HINDU

Online edition of India's National Newspaper
Monday, Sep 08, 2008
ePaper | Mobile/PDA Version

URL: http://www.thehindu.com/2008/09/08/stories/2008090850850200.htm

Fishermen face livelihood threat

Staff Reporter

Presence of prawn mafia and shrinking fishing area are some of the reasons

In dire straits: **Fishermen residing near Chilika Lake looking at the empty nets.**

BHUBANESWAR: The Odisha government's failure to rein in prawn mafias and a decision to open a sea mouth of Chilika, Asia's largest brackish water lake, are marginalising lagoon's fishermen, who are fast losing their traditional fishing rights.

Fishermen are increasingly becoming migrant labourers in the face of ever-shrinking fishing areas and depletion in fish production. The lake, which was famous for its fish resources, was also facing ecological threats such as salinity disturbance, high force of water during high and low tide, sand infestation and increase in sea animals.

A study conducted by Prateep Kumar Nayak, a scholar of Natural Resources Institute under Canada-based University of Manitoba, reveals scary trends pertaining to fishermen who are becoming pauper with every passing year.

Leaders of fishermen community, civil society activists and intellectuals also nodded in agreement with the findings here on Saturday.

Illegal prawn farming

“Till 1980s, fishermen were catching fishes through traditional fishing practices. But after that shrimp market witnessed unprecedented boom. It prompted influential non-fishermen to start commercial aquaculture, which was getting intensified despite courts and State assembly forum declared it as illegal in 1990s," Mr. Nayak said.

Now about 60 per cent of the lagoon fishing area was under illegal prawn farming, Mr. Nayak said.

The researcher too carried out a survey about occupational displacement of fishermen. The preliminary compilation suggests that fishermen are getting displaced from their traditional occupation.

Giving up fishing

Of the 74,144 adults, 49819 have either abandoned the fishing or in process of giving up their traditional livelihood options and rest 24325 fishermen still stick to fishing. Between 2002 and 2007, the migration had gone up astronomically, Mr. Nayak said.

Of 140 villages situated around Chilika Lake, 138 villages were experiencing migration while only two villages were left untouched by this trend. Similarly, fishermen in 131 villages were planning for future migration.

The decision to open new sea mouth for Chilika lagoon, which was apprehended to be the reason behind depletion of fish resources and destabilization of lake ecology, was taken "unilaterally" by administrators.

The survey said as high as fishermen of 130 villages were never consulted over the plan of hydrological intervention while residents of 10 villages said they were consulted.

As many as 135 villages gave written statement that there had been adverse impact of shrimp culture due to new mouth at Sipakuda.

Chilika, which remained the one of the most intensely fought livelihood sources in the country, was feared to witness further intensification of conflicts as fishermen were pushed corner further, he said.

ANNEXURE II

THE HINDU

Online edition of India's National Newspaper
Tuesday, Sep 16, 2008
ePaper | Mobile/PDA Version

URL: http://www.thehindu.com/2008/09/16/stories/2008091652560300.htm

Fish species becoming extinct in Chilika lake

Staff Reporter

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11 species 'locally extinct' or 'not part of regular catch'

Motorboats also impact growth of fish resources

BHUBANESWAR: Chilika Lake, with its picturesque sprawling blue waters and lagoon's tasty fish, has always attracted tourists. But fishermen are expressing fear over several species getting extinct.

A survey conducted with the help of key resource persons in seven villages located in the outer channel (Satapada and Parikuda) area during 2007-2008 revealed that as many as 11 fish species were found to be "locally extinct" or "near extinct" or "not part of regular fish catch."

The study was carried out to ascertain the availability of various fish species. The key resource persons were asked to record fish species that were used to be a part of their regular catch a few years (less than 10 years) ago but not seen or caught in the recent years.

The result was surprising, as some commonly found fish species such as *gania, chauli, chandi, balikhai, seba, kundala, baligarada, kanti, kanta, kadisha* and *sarabara* were missing from the daily catch-basket, said Prateep Kumar Nayak, a research scholar from Natural Resources Institute of Canada-based University of Manitoba.

“Different reasons are responsible for this change. Fluctuation in desired salinity levels and sand infestations are major causes.

Similarly, loss of ‘chari’ in the lagoon areas, earlier known as home for fish and shrimp juveniles, and depleting food sources of fish are leading to stiff competition for food among the lagoon species,” Mr. Nayak said.

He said motorboats, especially in the Satapada area, also impacted the growth of fish resources.

Livelihood concerns

Fishermen in and around the lake too feel the pinch. Of the 74,144 adults, 24,325 either abandoned fishing or were in the process of giving up their traditional livelihood options.

ANNEXURE III

HES Protocol Submission Form 1

Informed consent

UNIVERSITY OF MANITOBA

Natural Resources Institute
70 Dysart Rd,
Winnipeg, Manitoba
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General Office (204) 474-7170
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http://www.umanitoba.ca/academic/institutes/natural_resources

Research Project Title: Community-Based Resource Management and Social Justice in Chilika Lagoon, Odisha, India.

Researcher: Prateep Kumar Nayak

Proposed script for verbal recruitment of research participants in the semi-structured interviews that will be spoken in Odiya:

I am currently in the process of conducting my doctoral thesis research. The purpose of this research is to explore the processes and factors contributing to the marginalization of the fishing communities in Chilika Lagoon, India. Marginalization is understood as a process of loss of resource access and entitlements of fishers that may have resulted from or led to their disconnection with the lagoon resources. The specific objectives of the research are as follows: 1) To identify the key drivers and processes responsible for marginalization of Chilika fishers in the Indian context; 2) To analyze how access rights and entitlements have changed historically; 3) To examine institutional linkages across levels of social and political organization that promote (or hinder) decision-making. This researcher is being supported by the Trudeau Foundation of Canada through its doctoral scholarship programme. The research proposal has already been approved by the Joint-Faculty Research Ethics Board at the University of Manitoba (Canada).

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

In the course of the research you will be asked a series of questions that will help me understand the changes in the social, ecological economic and political aspects of Chilika and their impacts. Specific aspects such as the level of participation, rights on forests commons, adaptive management processes would be covered during the research process. You will be requested to participate in an interview session that will last in between 30 minutes and 1 hour. If more time is required, a subsequent meeting can by arranged at your convenience. These interviews may be conducted at your place of work, home, or at another location of your preference. After the interview you may be contacted and asked to participate in further research activities such as timeline building, network diagramming, social and resource mapping, ranking exercises, and going on a transact walk.

Your responses to questions during the several sessions of the research will be documented in a notebook. However, your names will not be recorded with the responses to ensure that your identity remains confidential. Your names will be recorded in a separate notebook for organizational purposes; for example, in case you need to be contacted for further information or clarification at a later date. There will be a group meeting organized towards the end of the research where I will verify all the information collected during the research process. You will have an option to disagree to any such information, in which case, the information would be suitably modified with your inputs. The data provided by you will be used to complete a progress reports, my Master's thesis, and will potentially be published in an academic journal. You will not be identified by name in any such publications.

You are free to decline to participate in this research, withdraw from the study at any time, and/or choose not to answer any questions you may not be comfortable with. If you do decline to participate in the study or answer any questions, you will not face any negative consequences. If I have not explained the study clearly, please feel free to ask for clarification or additional information at any time throughout your participation.

If you have any complaints or further questions about the nature of this research, your concerns may be directed to the Human Ethics Secretariat at the University of Manitoba (204- 474-7122), research@umanitoba.ca, or to my advisor, Dr. Fikret Berkes, Professor, who may be contacted at 204-474-6731, berkes@cc.umanitoba.ca. Please be advised that the staff at these offices speak only English.

Do you understand and agree to the terms described here?

ANNEXURE IV

A note on village selection criteria

Prepared during April 2007

The following village selection criteria have emerged from a series of interactions with a number of fishing villages in Chilika. In addition, I have also interacted with four non-fisher caste villages which has also helped in defining these criteria. Most fishing villages in the Satpada area of Chilika will fit into these criteria at varying degrees. However, over the last three months I have conducted focus group and semi-structured interviews specifically in seven fishing villages (i.e., Balabhadrapur, Sipakuda, Arakhakuda, Berhampura, Mainsa, Gorapur, Alanda) and all the seven fit well into the selection criteria. Considering the amount of work that has been done in these villages it is preferable that one of these seven villages should be selected as a study village. In other words, this would mean that even without a formal selection of the specific study village a lot of planned work has already been initiated in the 'to be formally selected' study village.

Criteria used for selection of study village

1. Villages inhabited by people who are fishers by caste

The primary focus of the study is on the fishers of Chilika. A fisher in the social and cultural context of Chilika is defined as a person or family belonging to a particular fishing caste under the Hindu *Varna* system. There are three types of villages from caste point of view: 1) villages where all the households are caste-based fishers; 2) villages where all the households belong to other castes (non-fishing castes) but some of them are engaged in fishing; and, 3) villages where a mix of both caste-based fishers and other non-fishing castes inhabit. In order to retain a good focus on the purpose and main questions of the study **"a village where all the households are fishers by caste be selected".** However, interaction with others, such as the non-fisher caste villages some of whom engage in shrimp aquaculture, is on and will continue during the course of the study to understand their role in the process of fishers' marginalization.

2. Villages where fishing has been the primary or only source of income

Traditionally, all caste-based fishers have been engaged in fishing as a primary and, in most cases, the only source of income for the household. Majority of these fishers do not own any agricultural land; a small number of households that own land do not bother to cultivate as the holding size is too small and the land quality is not great. In the recent years, with fish production constantly going down and there being many adverse impacts on pursuing fishing as a primary source of income, this lack of alternate income avenues has turned into an important factor for fishers' marginalization. As is observed, there is an increasing trend in out migration to distant urban centers of young and old from households of caste-based fishers in Chilika, which is mainly a reaction to the loss of fishing-based livelihoods in the historical absence of a second source of income. In this context, in order to study marginalization it is important to select **"a village where fishers have been engaged in fishing as the primary source of income".**

3. Villages which are impacted by the new sea mouth

The old (natural) mouth of the lagoon with the sea was getting closed slowly. The Chilika Development Authority (CDA) created an artificial mouth at a new location in 2000 and has also dug out deep canals inside the lagoon. This has created numerous problems that concern both the fishers' livelihoods as well as the ecology of the lagoon. Some of the problems include: high salinity, high force of water during daily high and low tide periods, sand infestation in the lagoon, decreasing depth in certain areas due to sand, increase in sea animals not found in the lagoon previously. These have not only brought down the fish production but threatens the very ecology of the lagoon. The new mouth has also influenced the rights and access situation in the waters of Chilika leading to conflicts as fishers travel outside their traditional fishing boundaries in search of fish, crab and shrimp. The impact of the artificially created sea mouth is so intense that any fishing village or any fisher on the coasts of Chilika mentions this as the 'number one' factor of their marginalization (meaning extreme loss of fishing-based livelihoods, loss of fishing rights in Chilika and access to their traditional fishing grounds). Thus, **"a village**

which has been adversely affected by the creation of the artificial mouth" needs to be selected.

4. Villages where lease (of fishing area) related problem exist including encroachment of traditional fishing areas (mostly by non-caste fishers)

The lease system (leasing of fishing areas to caste-based fishers) is more than three generations old (continuing from the king's time, recognized under the British rule and also recognized by the government of independent India). However, Chilika fishing areas, traditionally under the de jure control of caste-based fishers, are getting under the de facto control of non-caste-based villages and outsiders. Much of the later is used up for illegal shrimp culture. Important to note that the traditional (caste-based) fishing villages still pay rent to the government and take annual lease of their traditional fishing areas more than half of which is encroached by others. They continue to take lease even if fishing areas are encroached as a strategy to retain ownership claim on the fishing grounds. The government takes lease money at 10 percent increase every year but there is no protection provided to the leaseholders irrespective of their repeated applications. This shift in property rights is important, as there are indications that a state property like Chilika which has been managed as commons by fishers under continuous lease system for generations may be getting into a situation of open access. This entire situation not only distorts the access rights and entitlements of the fishers (see objective 2) but it also acts as a crucial factor for their marginalization. Consequently, it is important to select **"a village where lease (of fishing area) related problem exist including encroachment of traditional fishing areas".**

5. Villages impacted by shrimp farming

Shrimp culture is totally banned in Chilika by the orders of both the High Court and the Supreme Court. However, the lagoon has large-scale illegal farming of shrimp about 90 percent of which are owned by non-caste-based fishers and outsiders. Moreover, most of these shrimp areas are encroached from the traditional fishing grounds of the caste-based fishers. Due to excessive shrimp culture navigation in Chilika is difficult and in many

areas impossible. There are even villages where traditional fishers are just held up in their villages, as they cannot go fishing due to the extensive barricades of shrimp farms. Shrimp farming in Chilika alone is responsible for some major conflicts on rights and entitlements of fishers, and shapes the bulk of politics around the lagoon. Considering the role shrimp farming it is relevant to select **"a village that is directly impacted by the illegal shrimp farming activities in Chilika".**

6. Villages with loss of fishing-based livelihoods (including a trend of out migration)

Due to reasons like the impact of the artificial sea mouth and the increasing numbers of people fishing in the lagoon there has been an adverse impact on the total fish, crab and shrimp production. A day's work by two or three fishers on a motorized boat gets roughly a dollar and half a day which is a staggering figure as compared to more than 10 dollars a day just 7 to 8 years back (before the new mouth was created in 2000). Fishers in this area are gradually migrating out to urban centers and many do not go for fishing anymore. The loss of fishers' livelihoods is an important development and **"a village where there is loss of fishing-based livelihoods including a trend of out migration"** can provide scope for analysis on this issue.

7. Breakdown of village level Primary Fisheries Cooperative Society

The procurement and marketing of fish, crab and shrimp was being done through the village level cooperative societies. These societies were created even prior to the independence of India. However, due to various reasons (prominent being the increasing involvement of local traders in the procurement and marketing of products, breakdown of loan systems from banks, decrease in production, village level politics, etc.) the village cooperatives in most villages are not functional currently. Individual fishers sell their produce to the local traders, who give them loans even prior to the season with a condition that the fishers will sell their produce only to the specific trader at a cheaper price. The absence of a village level institution of fishers (like the cooperatives) adds to their marginalization. In this context, **"a village where the primary fisheries cooperative society has broken down"** could be studied to understand institutional linkages and decision-making arrangements with regard to Chilika fisheries.

ANNEXURE V

Household Survey Questionnaire
Implemented in Two Sample Study Villages

1. General Demographic Information

1.1 What is your name?

1.2 What caste do you belong to?

1.3 What is your educational qualification?

1.4 How many members are there in your family?

1.4.1 Male adults and their educational qualification:

1.4.2 Female adults and their educational qualification:

1.4.3 Male children and if they are going to school:

1.4.4 Female children and if they are going to school:

2. Occupation and Income

2.1 Is fishing your family's primary occupation?
YES NO

2.2 If yes, is fishing your family's only occupation?
YES NO

2.3 If no, what are the other occupations of your family?

1. Farming
2. Business (shops/fish selling/others)
3. Raising animals (chicken/cow/others)
4. Wage labourer
5. Migration (*dadan*)
6. Salaried service (government / private)
7. Fish trader/middleman
8. Others (specify):

2.3.1 When did you first take up these other occupations (Mention year or event)?

2.3.2 What is your annual income from these other occupations?

2.3.3 Where do you take up these other occupations?

1. Within village
2. Within state
3. Outside own village
4. Outside state

2.4 What is your total annual income from fishing alone?

2.5 What are your major heads of expenditure in a whole year? (Mention in reference to last two years)

1. Consumption
2. Education
3. Loan repayment
4. Social ceremonies of relatives
5. Health problems/Hospitalization
6. Marriage
7. Others (Specify):

2.6 What is your annual expenditure on consumption?

2.7 Is your total income sufficient for your annual expenditures?

YES NO

2.8 What are the causes of major financial crises you have faced in the last couple of years?

1. Food shortage
2. Health problems/ hospitalization
3. Notice from fish trader to return advance
4. Children education
5. House repairing
6. Marriage
7. Death in family
8. Notice from moneylender
9. Others (specify):

2.8.1 What were the measures you took to cope with the financial crisis?

1. Took loan
2. Discontinued children education
3. Took advance from fish trader
4. Changed food habits
5. Mortgage
6. Sold fishing boat
7. Migrated (*dadan*)
8. Changed fish trader
9. Purchases on credit from village shops
10. Others (Specify):

2.8.2 Did you take loans in the last couple of years?

YES NO

2.8.3 If yes, what is the total amount of loan taken?

2.8.4 Where did you get the loan from?

1. Advance from fish trader
2. Outside moneylender
3. Banks
4. NGOs
5. Friends and neighbours
6. Village moneylender
7. Relatives
8. Mahila Samity (Women's group)
9. Others (Specify):

2.8.5 What is the loan arrangement?

Rate of interest:
Repayment period:
Conditions on advance from fish trader:

2.8.6 What is the specific purpose for taking loan?

1. Consumption
2. Health problems/ hospitalization
3. Social ceremonies by relatives
4. Repaying existing loans
5. Buying fishing equipments
6. House repair
7. Marriage
8. Death in family
9. Repaying fish trader's advance
10. Children education
11. Repairing boats
12. Others (specify):

2.9 Do you have any outstanding loans at present?

YES NO How much?

3. Asset Holding

3.1 Do you own boats?

YES NO

3.1.1 If yes,

How many boats?
What size? 28" 30" 32" 33" 35" Others (Specify):
Whether motorized? YES NO
What BHP motor engine?

3.1.2 What purpose you use the boat for?

1. Fishing
2. Transportation
3. Others borrow it occasionally
4. Tourism
5. Broken down
6. Others (specify):

3.2 What are the types of fishing nets do you own and what quantity (numbers or kilograms)?

3.3 How much agricultural land do you own?

3.3.1 Do you currently cultivate the land?

YES NO

3.3.2 If no, how the land is being used?

1. Remaining fallow
2. Not suitable for cultivation
3. On sharecropping
4. Others (Specify):

3.4 What other assets do you own?

4. Out-migration

4.1 Has anyone from your family ever migrated to urban centers in search of work?
YES NO

4.1.1 If yes, how many family members have migrated?

4.1.2 When did he/they first migrate (year/incident)?

4.1.3 How many times (give years) has he migrated?

4.1.4 What were the reasons of his/their migration?

4.1.5 What was the total amount earned from migration as a source of income?

4.1.6 What were the reasons for which he/they returned from migration?

4.2 Are you or any of your family members planning to migrate out?

4.3 Do women in your family take up daily wage activities?
YES NO

5. Ecological Situation of Chilika

5.1 For how many years have you been fishing in Chilika Lagoon? (Mention number of years or event)

5.2 Do you observe any changes in the ecological character of the Lagoon?
YES NO

5.2.1 If yes, what are some of the major changes?

1. Sand infestation (loss of sedimentation)
2. Increased salinity
3. Increase in carnivorous fish species
4. Decrease in numbers of dolphins
5. Shrinking lagoon area
6. Less migratory bird
7. Loss of fish habitat
8. Loss of phytoplankton biomass
9. Increase in sea animals
10. Decrease in fish stock
11. Force of water at high and low tide
12. Fluctuations in fish seasonality
13. Extinction of fish species
14. Others (Specify):

5.2.2 What do you think is responsible for these changes?

1. New artificial sea mouth
2. Shrimp farming
5. Increase in motorized boats
6. Spun catching/fishing

3. Use of *alim* net/zero net/disco net
4. Degradation in the catchments
7. Others (Specify):

5.2.3 What, in your opinion, can be done to improve the ecological situation of the Lagoon?

1. Close down the new sea mouth
2. Ban shrimp farming in Chilika
3. Ban destructive nets
4. Regulate use of motorized boats
5. Renovate the old natural sea mouth
6. Stop spun fishing/catching
7. Others (Specify):

6. Impact of the Sea Mouth

6.1 Do you think that the creation of the new artificial sea mouth has impacted your fishing activities?

YES NO

6.1.1 If yes, what are the impacts, in your view, of the artificial sea mouth on your fishing activities?

1. Decrease in fish stock and catch
2. Insect (Marai) attack on wooden boats
3. No help from dolphins while fishing
4. Fishing is risky due to sea animals
5. Others (Specify):

6.1.2 What do you think are some of the solutions to these problems?

1. Close down the new sea mouth
2. Clear up channels connecting to rivers
3. Renovate the old natural sea mouth
4. Other (Specify):

7. Shrimp Culture

7.1 Do you experience any problems from the shrimp farms in Chilika while fishing?

YES NO

7.1.1 If yes, what are some of the problems you experience?

1. Shrimp spun catching
2. Shrinkage fishing area
3. Obstruction of boat movement
4. Chemical pollution
5. Increasing conflicts
6. Problem in fishing (Bahani/Chimuta)
7. Destruction of fish spun
8. Limited feeding area for fish
9. Obstruction of fish movement
10. Diversion of farmland
11. Less fish production
12. Other (Specify):

7.1.2 What, in your opinion, could be done about this?

7.2 Do you own shrimp ponds in Chilika?

YES NO

7.2.1 If yes, how many acres?

7.2.2 When did you start shrimp culture (year)?

7.2.3 Are you doing it alone or in partnership? (Mention with whom – fisher / non-fisher / own village / outside villager)

7.2.4 What are some of the reasons for your starting shrimp culture in Chilika?

7.2.5 Are you aware that shrimp culture is illegal in the Lagoon?

7.2.6 On what conditions would you be willing to stop shrimp culture in Chilika?

8. Relationship with the Lagoon

8.1 As a customary caste-based fisher, what do you think about your relationship with the lagoon?

8.1.1 Has it improved over the years?

YES NO

8.1.2 If yes, what are the reasons for improvement?

8.1.3 Has it suffered over the years?

YES NO

8.2 Do you think that you are slowly getting disconnected from the lagoon?

YES NO

8.2.1 If yes, when did this process of disconnection started? (Year/s or a landmark event)

8.2.2 What are, in your opinion, some of the main reasons responsible for this disconnection?

1. Ecological degradation of Chilika
2. Loss of income from fishing
3. Defective lease system
4. Illegal shrimp farming
4. Increase in numbers of fishers
5. Fewer fishing days
6. Involvement of non-fishers
7. Others (Specify):

8.2.3 What are some of the impacts of this disconnection? Or, What is the extent to which you have been disconnected from Chilika?

1. Loss of income
2. Migration (Dadan)
3. Discontinue education
4. Weaken social relations
5. Threat to food security
6. Change in livelihood sources
7. Depression
8. Others:

8.2.4 What are the ways through which you have coped or are coping with the process of your disconnection with Chilika?

1. Take loan
2. Attend rallies / agitations
3. Collaborate with Mahasangha
4. Migrate (*dadan*)
5. Collaborate with NGOs
6. Others (Specify):

8.2.5 What, in your opinion, are some of the ways through which your connection with Chilika can be restored or maintained or strengthened?

1. Restore ecological condition of Chilika
2. Renovate natural sea mouth
3. Secure right to fishers
4. Ban shrimp farming
5. Strong village institution
6. Close new sea mouth
7. Enhance fish stock
8. Remove non-fishers
9. Others (Specify):

9. Bundle of Rights and Bundle of Powers: Access and Entitlements

9.1 As a customary caste-based fisher what do you understand by your rights in Chilika?

1. Freedom to fish in village area
2. Free movement areas
3. Exclude non-fishers
4. Decide what is good for Chilika
5. Sole rights to customary fishers
6. Ownership rights over fishing
7. Others (Specify):

9.2 How can your rights be strengthened or ensured?

1. Terminate lease system
2. Ban on Shrimp farming
3. Policy on Chilika
4. Maintain ecological health of Chilika
5. Boundary demarcation
6. Remove non-fishers
7. Consultation by government
8. Other (Specify):

9.3 Do you have enough powers to exercise your rights meaningfully?

YES No

9.4 What are the powers you would like to have to exercise your rights meaningfully?

10. Institutional Linkages

10.1 Are you a member of the village Primary Fisheries Cooperative Society (PFCS)?

YES NO

10.2 What benefits or facilities do you avail from the PFCS as a member?

1. Annual lease
2. Loans
3. Information
4. Bonus
6. Marketing
7. Disaster relief
8. Storage
9. Others (Specify):

5. Transportation

10.3 Whom do you sell your fish, crab and shrimp?

1. Primary Fishermen Cooperative Society
2. Sell locally
3. Fish trader
4. Others:

10.4 If you are selling your produce to the trader:

10.4.1 Why are you not selling to the PFCS?

10.4.2 What are the reasons for selling to the trader?

10.4.3 What is the arrangement with the trader?

1. Advance payment
2. Low price
3. Commission
4. Fishing equipment
5. Low weight
6. Others (Specify):

10.5 Have you ever taken loans from a bank?

YES NO

10.6 What other institutions do you contact in case of need?

11. Would you like to make any other comments?

ANNEXURE VI

Guidelines for Household Level Monthly Livelihood Monitoring Sample Households in Two Study Villages

1. Record of daily fish catch:

- Total quantity of different species of fish
- Total income from fishing
- Big day of the month: Highest quantity of fish on a particular day in the month
- Big income of the month: Highest income from fishing on a particular day in the month
- Changes in fishing behavior: targeting fish species and fishing areas in the lagoon
- How the fish was disposed: self selling, trader at the village level, trader at the market, processing such as dry fish, others.
- Total expenditure on fishing trips (such as diesel for boat, fishing gears, boat hiring, etc)

2. General income and expenditure:

- What other non-fishing sources of income and how much?
- Whether any new occupations were taken up?
- What was the total expenditure (including consumption and others)?

3. Loans, advances, mortgage and sell

- How much new loan was taken?
- From what sources the loans were received?
- What are the reasons for taking new loans?
- Whether new advances were received from the fish trader?
- Whether any household assets were mortgaged for money?
- Whether any repayment of the existing loans was made?

4. Out-migration:

- Whether anyone from the household went on migration?
- Whether anyone from the household returned from migration?

5. Health and well-being:

- Whether the household was well health-wise? - If anyone was sick.
- How they dealt with the health problem?
- How the medical expenses were arranged? – Loans, advances, mortgage, others.
- Whether health affected fishing and other activities, and its related incomes?

6. Birth and death:

- Whether were births or deaths in the family or in the near relatives?
- Details on the type of financial requirements related to birth and death.

7. Marriage in home or attended elsewhere:

- What was the extent of expenditure and how it was arranged?

8. Education:

- Has anyone dropped out of school or been irregular attending the school?
- If yes, what are the reasons?

9. Major purchases and money spent (non-fishing):

- What are the major / big purchases or things on which a lot of money was spent?

10. Purchase of items (fishing related):

- Whether fishing related items were bought, what were they, how much money spent, and how the money was arranged?

11. Change in fish trader (*Mahajan*):

- Whether fish trader was changed?
- If yes, how the advance of the old trader was returned?
- If new advance was received and what are the terms and conditions of business with the new trader?

12. Food habit or stress:

- How was the overall food related experience?
- If there was any change in the general food habit of the household.
- Did the household have to make compromises with the quantity and quality of food? What are some of them? Was there a food stress?
- What was the total expenditure on food (calculated on the basis of kilograms of rice and other costs)

13. Any other major events or livelihood related experience during the month:

ANNEXURE VII

Questionnaire for General Survey
All Customary Caste-based Fisher Villages in Chilika

1. Name and postal address of the village:

2. Gram Panchayat in which the village is located:

3. How many fishermen have migrated out from your village during this year?

4. Are others planning to migrate out in the coming days?

5. When (year or incident) was the first time fishers from your village started migrating out?

6. Was the village informed or consulted by the government before the creation of artificial sea mouth near Sipakuda?

7. What are the impacts, in your view, of the artificial sea mouth either on Chilika Lagoon or on your fishing activities?

8. Are you aware that shrimp culture is illegal in Chilika?

9. What are some of the impacts, in your opinion, of the shrimp farms inside and around Chilika Lagoon?

10. What changes do the villagers observe in the ecological character of Chilika Lagoon as compared to what it was at least ten years back?

11. As a customary caste-based fisher village, do you feel that your relationship with Chilika has become weak over the years or the village is getting disconnected from the lagoon? Mention reasons if possible:

12. As a traditional fishing village what do you understand by your rights in Chilika?

13. What is the status of the Primary Fishermen Cooperative Society (PFCS) in your village?

a. Functional b. Dormant c. Dysfunctional d. Does not exist

14. Fishing area lease related information:

Original fishing Area (acres)	**Actual lease taken (acres)**	**Area encroached by others (acres)**	**Area sub-leased (acres)**

ANNEXURE VIII

Questionnaire for Semi-structured Interviews and Focus Groups Fishers' Federation and it factions

1. What is the general profile of the organization? (Date of formation, criteria used for membership, main process followed in the formation, legal status, etc.)

2. What is the organizational structure of the groups within the larger federation?

3. Are there rules / norms set by the groups? What are they?

4. What are the main reasons for separating out from the main federation?

5. Do you think that the formation of groups on the basis of caste or particular geographical region within the lagoon is a useful way to build people's organizations? Explore the role of caste panchayat and other players in this process?

6. Whether separating out from the main federation has helped in achieving the objectives? What are some of the pluses and minuses?

7. What are the main agenda / issues for each of the groups?

8. How do they think these groups can work together when their interests are clashing?

9. How do you manage your group financially?

10. Why the federation has not been able to fight for rights of fishers after the 2001 rally in Bhubaneswar? Ask this question in relation to the new sea mouth and shrimp aquaculture on which there has not been any major protest in the recent years.

11. How do the groups within the federation see the process of their coming together under an umbrella federation? What are the plus and minus linked to this process.

12. What are some of their future plans and strategies with regard to the issues facing Chilika and its fishers?

13. What are some of the policy recommendations the federation things are critical for the management of the lagoon?

ANNEXURE IX

Questionnaire for Semi-structured Interviews and Focus Groups Various Boat and Tourist Associations in Chilika

1. Profile of the association: Structure and functions

2. Do you observe any changes in the ecological character of the Lagoon? What are some of the major changes? What do you think is responsible for these changes and how? What, in your opinion, can be done to improve the ecological situation of the Lagoon?

3. What are the impacts of the new sea mouth on Chilika and the fishers? What in your opinion can be done in this regard?

4. What are the impacts of shrimp culture on Chilika and the fishers? What in your opinion can be done in this regard?

5. What are your views on the growing out-migration rate from fishing villages in Chilika? What can be done about this? Do you think eco-tourism can bring about solutions to the problem of out-migration, in specific, and loss of fishing-based livelihoods, in general?

6. What is your opinion on the relationship of fishers with the Lagoon?

7. What do you understand by rights in Chilika by: Customary caste-based fishers, non-fishers, and the boat association?

8. What are your future plans? Would it be restricted to being just a boat association / tourist center or expand into addressing other Chilika and fisher related issues?

ANNEXURE X

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INDIA ONE RUPEE

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