CHAPTER 6

CONCLUSION

All over the world, local commons are facing more and more complex problems due to changing socio-economic, political, ecological and cultural conditions of their livelihood. Institutions governing the livelihood issues have emerged as crucial agents of sustainability. Institution is defined as a set of rules, eligibility criteria, decision-making arrangements, punishment structures, and action assignments. Sustainable commons are strongly related to the capacity of the stakeholders to design and share institutions that are enforced and continuously adapted in face of evolving conditions. In the context of alternative development paradigms, multiple-use common property resources have come under consumptive pressures from local, regional, national and international stakeholders. With the advent of open market economy and globalization, pressure on the common property resources has become more obvious.

South Asia has a large number of wetlands ranging from glacial wetlands in Himalayas to mangroves and coral reefs. They support a large number of biodiversity and livelihood of millions of people in the region. These wetlands are severely threatened by the impacts of increasing human population and high economic expansion of the region as well as due to climate change. So there is a need for regional arrangement under the Ramsar Convention on Wetlands for cooperation and collaboration for the conservation and judicious use of wetlands particularly in wetland management and poverty alleviation in South Asia. This collaboration will add value to national efforts in areas such as in the management of transboundary wetlands, conservation of migratory and common species they support, enhance coordination between international and regional wetland programmes, data and experience sharing and interlinkages between MEAs addressing wetland issues. It could also be used as a forum to mobilize assistance for non signatories' parties to sign and ratify the Ramsar Convention and designate wetland of international importance which could enhance communication and collaboration between existing institutions and programmes. Similarly, a South Asian regional arrangement could be modelled on the existing MedWet initiative, which mobilizes partners and funds to assist in the implementation of the Ramsar Strategic Plan in the Mediterranean region. However, the structure and modalities needs to be determined only after full
consultation between all stakeholders. The intergovernmental programme SACEP (South Asia Co-operative Environment Programme), in which five members are party to Convention can be modelled on this.

The thesis has analysed the problem of lagoon wetland and the need for environment management along with the role of management institutions on common property resources as development drivers and safety net providers. Particularly, the role of Supra-National, National and Sub-National institutions in environmental management around Chilika Lagoon (largest brackish water lagoon in Asia- a Ramsar Site) in Orissa, India and Bundala Lagoon in Sri Lanka has been studied closely.

Lagoon wetlands are surrounded by a number of problems which include pollution (including run-off from agricultural areas and industrial effluents), over fishing, over grazing, erosion and climatic change which affect water supply. Wetlands at the end of rivers are particularly vulnerable to the impacts of freshwater influx, affecting its salinity level and thus its productivity. The siltation caused due to mud brought by these streams leads to the danger of reduction of its area and eutrophication. Several types of wetlands in the coastal areas are also influenced by alternate floods and ebbs of oceanic tides. For instance near the coastlines, the salinity of the water approaches that of the ocean, whereas further inland, the tidal effect can remain significant even when the salinity approaches that of freshwater.

The vulnerability and degradation of wetlands in general and of lagoon wetland in particular have been accelerated by the needs of developed economies and economic compulsion of developing countries. The role of environment management therefore becomes all the more important in this age of globalisation in which both developed and developing countries cannot afford to live in isolation. This has thus accelerated the need of environment management.

Environment management here can be defined as a process to improve the relationship between man and environment so that quality of both, the environment and human society may be improved. This may be achieved through check on destructive activities of man, conservation, protection, regulation, and regeneration of nature. Thus it is an interdisciplinary approach to resource conservation and recycling and it acts as regulatory force on human wantonness in resource exploitation and resource wasting. So, environment management aims to conserve what needs to be
conserved, protect what needs to be protected and regulate utilisation of natural resources to acceptable limits. Environment management therefore involves protection of environment, enhancement of economic value of the environment and its resources and preservation of the environment for future generations and this requires proper scientific strategies.

The strategies of environmental management as stated in the earlier chapters broadly follow spatial consideration and methodological consideration. The environmental managers whether at local, regional, national, or international level, needs to keep this in mind that earthly resources are finite and environmental system is a closed system. Therefore environmental planning may be approached at local, regional, national or international levels as regards the spatial dimension and the management strategy may be chalked out on the basis of needs, aspirations, perceptions, priorities and inhibitions of the individuals, society and government.

The methodological consideration however follows two approaches to environmental planning and management viz. Preservative approach and Conservationist approach. Preservative approach advocating on non-interference of man with nature seems not viable because non-interference with natural environment would lead humanity to complete starvation and even extinction since man is dependent on nature even for its minimum subsistence. The second approach of environmental management conservationist approach offers more plausible solution in which the environmental resources may be utilized for the socio-economic development of human society but efforts should also be made to maintain ecological balance, ecosystem stability and environment quality as far as possible by adopting suitable and pollution-safe technologies and making the society answerable to any maladjustment in the natural ecosystem.

The growing interaction between man and nature and man’s over utilisations of natural resources has created pressures on environment. These pressures have also been witnessed on wetlands and the case studies on Chilika and Bundala summarises these pressures. Though pressures on these biodiversity hotspots are there but recently efforts have been made by world community to reduce them and to work towards sustainable development.
Chilika Lake presents a complex ecosystem with multiple stakeholders. With a 64 kilometer length, 20 kilometer width, average water spread area of 1065 square kilometer and a catchments area of 4406 square kilometer it provides livelihood to 190 villages i.e. approximately 0.2 million fisher folk. Chilika Lake thus has vast natural resource. However, this natural resource has led to increasing population pressure on it along with the diverse vested interest of various sections has led to resource conflict, resistance and uprisings at various point of time. The fishing and property rights are not fixed in space and time and shifts according to shifting property relations, environmental circumstances, and social conflicts among actors both inside and outside. These different actors have not only diverse character but also diverse goal. The diversity of nature and goal has been also the root cause of conflicts among different actors.

The lake therefore presents a classic case of conflict between the traditional fishing rights vis-à-vis commercial fishing by outsiders. Shrimp mafias have captured almost the entire lake for commercial exploitation of tiger prawn, a shrimp species very popular in East Asian countries. Unauthorized encroachments for shrimp culture are rampant. Mostly the mafias running the trade involve local people to gain legitimacy. The local fisher folk which have been depending on the lake’s resources for generations are easily deprived of its basic livelihood. Bundala lagoons are also facing unauthorized entry of sea fishermen due to increased distribution of boats in the aftermath of Tsunami and some other reasons and these unauthorized entry is also leading to turtle killing, crocodile killing, and bird poaching and law and order problems which is interfering with BNP management.

Chilika lake management journey however, in the recent past has traversed from inclusion of the lake into Montreux record of Ramsar Convention in 1992 due to ecological degradation to removal of its name from Montreux record and Ramsar wetland Conservation award and Evian prize-2002 to CDA. Its journey has been marked by conflicts, journey and sacrifices at various level. Chilika lake ecological richness, and the resources and service derived from it has attracted many actors in this basin. These actors ranged from State, multilateral institutions, business firms, civil societies, new social movements to local communities, fisherman and non fisherman etc.
All these factors have forced state and various other agencies to bring a controlled management for fishing. In this direction the local Government has brought a number of legislations. A high power autonomous body (Chilika Development Authority) is looking after the issues involving development, conflict resolution, peaceful settlement, eco-management etc. Legitimate stakeholders, particularly local communities and indigenous people are being strongly encouraged to take an active role in planning in these management institutions. Supra-national institutions - Wetland International, Ramsar Centre- Japan, JFGE-Japan, Danish Embassy, New Delhi, World Bank etc., National institutions - Ministry of Environment and Forest/Water Resources/Agriculture, National Bank for Agriculture and Rural Development etc., Provincial Government institutions like Department of Fisheries and Animal Resources/Agriculture/Revenue/Forest, Remote Sensing Application Centre etc., Non-Government Organisations - Wild Orissa, Pallishree, Centre for Environment Education, Campaign for Conservation of Chilika Lagoon etc., Research institutions - Utkal University, Botanical Survey of India, Central Inland Fishery Research Institute, Bombay Natural History Society, National Institute of Oceanography- Goa etc., and Local Community institutions (Fish Co-operatives, Watershed Committees, Self Help Groups, Self Help Co-operatives, and Migratory Bird Protection Committee etc.) play active role in management of the common property resources of Chilika Lake.

The intervention of these management institutions has brought a visible change in production of fish and shrimp, conservation of ecosystem, livelihood protection of the depending fish folk population, conflict resolution etc. This sort of co-management between the Government and other supportive agencies has not only created a space for development but also has given a platform for the affected population. However, the insights gained into the ongoing struggles, conflicts, negotiation, mediation and adaptations of stakeholders, major learning points are identified to be replicated to the extent to which institutions can be better designed for governing the local commons.

Though, there has been effort everywhere to maintain the sustainability of resources by intervention at various level and scale, yet economic globalization and climate change has particularly hastened resource degradation. The development of institutions and governance at various scales have in most of the cases excluded community involvement. However, long term sustainability of resource management
is only possible by involving community though their varying claims and disputes cannot be addressed without the intervention of the state.

There has also been reportedly gaps in approaches and opinions between the state based Orissa Krushak mahasangh and the village based Chilika Bachao Andolan which has been equated as northern “wilderness agenda” and southern “survival agenda”. In the future with changing socio-ecological system as a result of ever increasing demand of resources conflict may take some new turns and may pose challenge to survival and management. It is therefore necessary to understand the nature and dynamics of conflict. Here, there is strong bonding within communities and weak linkages with outside agencies, which has played significant role in fisheries management. The role of State in fisheries management has increased in other developing countries and are likely to increase in Chilika as well. So, the significance of linking social capital is particularly important in improved fisheries governance and co-management. It is thus needed to strengthen network across groups and agencies in fisheries. Local institutions could be legitimised and fishing communities can be given more rights and responsibilities to strengthen linking social capital for improved management outcomes.

Despite all these shortcomings one can not overlook the efforts made by these institutions. For instance CDA has done exemplary work in restoring the wetland ecology and minimizing the conflict in the basin by adopting ecosystem approach including adaptive management, participatory management and sustainable development policy. There is need of further carrying forward this approach and taking the lessons from its failure and success and moving forward in the restoration effort.

Bundala National Park is one of the three Ramsar site in Sri Lanka and is a unique coastal ‘wetland of International importance’. Bundala is important for wintering the richest variety of waterfowl outside the Northern Province and is also among the most important habitats for birds (southern-most land mass in migratory route) and other wildlife species in the entire country. Bundala was upgraded to the state of a National Park in 1992 under the management of the Department of Wildlife Conservation.

History of wetland protection in Sri Lanka is recent. It started only in the late nineteenth century. However, till recently the recognition had not come to ground reality about conservation of wetlands. In 1897, enactment to protect the coastal belt
system was promulgated. Major legal provisions since early 20th century are Coastal belt protection Ordinance (1897), Fauna and Flora protection Ordinance (1937) and (1969). Apart from these ordinances there are also several administrative agencies that are involved with the Park area at different levels. These agencies are Southern provincial council and other local administrative authorities, Department of Wildlife Conservation, Coast Conservation Department, Fisheries department, Irrigation Department, Lanka Salt ltd etc. Most of the land in the park is State owned. There are also some privately owned lands along the Hambantota-Weligatta highway and in the eastern sector of the Park, though national Park status does not allow it.

The politics of environment is increasingly being fought out at the international level. It is in this respect that Sri Lankan government is also part of several international agreements and International organizations such as Asian Development bank (ADB) and GEF (Global Environment Fund) are involved here in protected area conservation programme.

In 1993 Central Environment Authority (CEA) carried out Wetland Conservation Project (WCP) for Bundala National Park under the Conservation Management Plan (CMP) in close cooperation with Department of Wildlife Conservation (DWLC). CEA conducted WMP could not be implemented in totality and so GEF funded Bundala management plan was started in 1997. Further in 2005 another plan, the ADB assisted protected area management and conservation project (PAMWCP) started to strengthen the Department of Wildlife Conservation ability to manage protected areas in accordance with management plans.

An important feature of Bundala Wetlands management is that negative effect of anthropogenic activity compared to Chilika is less as population pressure is heavier in Chilika surrounding than in the Bundala. Further Bundala wetlands have been a part of Bundala National Park and thus management plan has been assisted by International Organisation such as Asian Development Bank (ADB) and Global Environment Facility (GEF). The management plan is very elaborative and its proper implementation is likely to usher into wetland improvement in a major way. However, successful restoration would also depend upon upper catchment irrigation management.
Despite all these efforts with the help of state, national and international agencies as stated aforesaid the progress at Bundala wetland has been the least satisfactory. There are several reasons that can be seen behind such least progress. These reasons like other wetlands problem as in other parts of world range from lack of vertical and horizontal integration in wetland management.

There are various other problems in Sri Lanka in general such as failure of water management. These water management failures in general also have its effects on wetlands. The failure of water management has been the result of various factors such as fragmentation of water management among sectors and institutions. This has led to development of no comprehensive water resource policy since numerous sectoral institutions formulate water resources policies relating to their respective sectors. Thus the coordination and communication between these organisations are minimum and responsibilities are often not clear, overlap and gaps exists.

The lack of comprehensive water management policy has only led to heavy dependence on centralised administration to develop, operate, and maintain water systems. Most rivers in Sri Lanka are inter-provincial and therefore responsibility lies with the national government. Instead of the creation of a consistent water policy and consistent water act on national level, the present water policy and water right system does not acknowledge the multiple uses of water and potential uses of water in a coherent way.

The integration between water quantity and surface water and ground water too is missing in Sri Lankan water management policy. Currently each of these aspects is considered separately by a separate institution. The abstraction of groundwater is even not regulated by existing legislation at all.

In general, in Sri Lanka, policy and legislation concentrates on one sector, being the agricultural sector. No general legislation exists for river basin management and there is no river basin planning and management organisation. This results in water utilization for immediate and local needs in an uncoordinated manner. In the sub basin of Kirindi Oya river basin the irrigation sector is the main interest group. However, competition between the multiple uses of water occurs due to the high spatial and temporal variation in rainfall over the whole river basin and non-optimal water management.
The irrigation sector is heavily represented in the project management committee (PMC). This results in a water allocation strategy in the advantage of irrigation. All the other interests in water, like fisheries, livestock and the environment do not have an important input in the PMC. Therefore they do not get water especially and the drainage outflow from the KOISP into the Bundala National Park is not controlled and monitored. Even though the upstream irrigation practices influence the inflow into the KOISP, there seems to be no communication between the irrigation offices in the upstream part of the river basin and irrigation offices related to the KOISP. Communication between the ID and the other stakeholders in the river basin, like the NWS&DB, the Forest Department and Department of Wildlife Conservation, also do not exist. Degradation of lagoon water due to polluted and saline water from upstream area have been reported which illustrates that there is no overall water management policy. Besides, the drainage outflow is not managed and controlled at all.

Apart from these administrative troubles in wetland management there are also other problems related to city dwellers and problematic relation between community and DWLC staff. This has been an important factor behind minimal progress made at Bundala wetland. The least progress made at Bundala is also related to Coastal Conservation Departments that mainly looks after the coast and this coast being of limited importance, strategically and economically is not given much importance for conservation. City dwelling people who come here for safari tour were really against community involvement in decision making for the park management and community outreach programme. This had led much controversy in commencement of the ADB assisted project. The ADB assisted project was delayed due to the opposition because of vested interest involvement. Communities in the surrounding area are not very keen in following regulatory measures of the Park and its wetlands. There is an emotional separateness between community people and DWLC staff as latter has never ever tried to relate to the community and DWLC acted as regulatory mechanism. The staffs were more interested in fauna protection and least about the damage caused to the community.

Another problem in Sri Lanka is related to the data since lot of the data is missing or unknown. Therefore research to fill up these information gaps are highly needed. More information is needed about the consequences of supplementary drainage outflow into the lagoons. It is also required to know the range of allowed drainage
outflow into the lagoons in both Maha, and Yala season. When this range is known, monitoring is needed to keep the water quantity and water quality in the lagoons within the defined range. A new authority could be given responsibility and control over the drainage outflow and the authority to order a change in the irrigation regime of the KOISP if the specified range is exceeded. A further research on land-sea interface relation is required as it is unknown whether the coastal ecosystem depends on a specific range of drainage outflow, considering both water quantity and water quality aspects. Attention should also be given to some kind of water management committee consisting of all water interests in the related river basins, i.e. the Kirindi Oya, The Embilikala Oya, and the Malala Oya river basins or communication and arrangements between diverse interests should be emphasized.

Thus in Sri Lanka an effort should be made to solve their water management problems and to bring one comprehensive water policy in such a way in which other national and sectoral institutes can be integrated vertically and horizontally. Efforts should also be made to bring coordination and bonding between community people and staff of the park for the proper management of Bundala wetland.

Here it is noteworthy that even a small country like UK could designate 161 wetlands as Ramsar sites, India being a mega-diversity country, so far managed to delineate a mere twenty five sites till date. There is obviously much ground to be covered in our conservation efforts of wetlands and also in Sri Lanka too. In addition, a paradigm shift in conservation ethic is also a strong need of the hour. This shift is necessary and perhaps mandatory due to the very nature of resource being conserved and 'protected'. Since wetlands are a common property resource, it is an uphill task to protect or conserve the ecosystems unless; the principal stakeholders are involved in the process. The dynamic nature of wetlands necessitates the widespread and consistent use of satellite based remote sensors and low cost, affordable GIS tools for effective management and monitoring.

An economic aspect of wetlands such as realistic costing of water is not done yet leading to people's apathy to water conservation. To save wetlands the key is to price water right that would lead to better water conservation. This was experience gained while advising water supply projects in the US. Social and natural sciences has to come together to save our wetlands. It is also important to formulate a national
wetland policy and make laws to integrate wetland management into the planning and implementation of every developmental project. Creating more man-made wetlands today at the cost of natural wetlands need to be mitigated.

Apart from these there are several prepositions and suggestions which have to be taken in to consideration before making environment management in general and for wetland in particular a success. These prepositions and suggestions can be summarised as- Consensus needs to be arrived at as to what can be called as "wetlands" whether paddy fields can be included under the designation or if prawn-culture ponds could be so identified. This issue came up as there is a discrepancy in defining the exact areal extent of wetlands with estimates ranging from 1-5% to 18.4%. The consensus also needs to arrive at pollution, siltation issues and the interaction and importance of water to the maintenance of wetland ecosystems. Apart from it coordination and implementation of scientific strategies at appropriate levels with concerned State Government, Central Government, NGOs and other agencies by a single nodal body need to be arrived.

There is also a need for the constitution of national and regional wetland management committee and/or wetland watch group to consolidate the initiatives of each agency report at regular intervals for consideration of the government. There is also a need by government to Frame national wetland policy, establishment of national wetland research institution for monitoring and management, development of national lake and wetland information system, establishment of seed banks for all the mangrove florlas, etc., by the government which are yet to be ratified by DST

The technological tools such as Remote Sensing and GIS tools can be used to have a national data repository on wetlands. Leveraging Public-Private Partnerships along with the value of stakeholder participation need to be taken in account to achieve the goals. The other important measure for environment management is related to integrated approach for wetland conservation along with proper data and systematic research analysis to understand the source of water, sediments and nutrients and their behaviour in wetlands. This is required to formulate suitable management strategies for maintaining the sound health of the wetlands since the proper data and research will help in assessing of the surface and groundwater interaction as well as recharge potential and other ecosystem services potential of wetlands.
Efforts could also be made for generation and documentation of base line data and other information of Ramsar sites for their biodiversity assets including mapping and creation of inventories.

It is apparent that the institutions and governance mechanisms, in terms of regulating the relationship between humans and the natural environment, are insufficient and poorly understood. There is an urgent need to develop better governance mechanisms at all levels to cope up with ongoing changes in the Earth system’s parameters.