Role of Participatory Approaches in Wetland Management: Evidence from the Bundala Wetland of Southern Sri Lanka

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Abstract

Wetlands are the most productive and vulnerable ecosystems in the world. Over the decades, they have been degraded and destroyed due to over exploitation of wetland resources and improper development activities. Bundala wetland is one of the wetlands among them which has a threat of being degraded at present. Hence, this study was conducted to ascertain the key aspects of the sustainable wetland management plan with regard to perspectives of stakeholders. Participatory approaches enable people to plan and act in the society facilitating bottom up approach. Data were collected through a focus group discussion with a group of lagoon and marine fishers, farmers, members of village wetland committee and park officers. Resource map, pair-wise ranking and historical profile were the participatory tools used for data collection. Bundala wetland has five natural lagoons and provides a breeding ground for turtles. Lagoon fishing is main livelihood. However, people employ in the salt factory as an alternative income. They stressed that immediate actions should be needed to divert the drainage water which flow from the paddy fields to the lagoons. Further, they highlighted eradication of invasive species which is a threat to the wetland biodiversity. During the last decade, drastic changes were observed in lagoon fishing, marine fishing and agriculture. Lagoon fish (shrimp) harvest drastically reduced, several fish varieties were disappeared. Marine fishers were experienced of a cold water layer in the sea surface. Further expressed their observations on changes in rainfall pattern and its intensity and the high temperature during last four decades. Community has identified that biodiversity, eco-tourism and lagoon fishing are the important aspects for a sustainable wetland management. Findings of this study imply that participatory approaches are advantageous to act on sustainable wetland management as the information has come out from stakeholders of the wetland practicing bottom up approach.

Keywords: *Bundala Wetland, Participatory Approach, Sustainable Wetland Management*

Introduction

Wetlands are amongst the world's most valuable, productive and vulnerable environments on the earth which a variety of plants, animals and human communities depend. They are most productive ecosystems that provide vast range of important ecological functions and eco-system services. Wetland systems directly support human beings and indirectly as well providing goods and services to the world outside the system of wetland. Food sources, fire wood, recreational purpose (bird watching, eco-tourism, sailing, recreational fishing and hunting) are direct uses of wetlands that can be catered the nature and the society (Barbier *et al.,* 1997). Apart from these direct use values, indirect use values are benefitted by the people and animals as wetland functions and eco-system services such as flood and flow control, groundwater recharge and discharge, water quality maintenance, biodiversity and carbon sequestration.

Over the past decades, wetlands have been degraded and converted by industrial, urban and agricultural waste. Consequently, in the tropical countries, wetland areas have been lost rapidly (Junk, 2002). Due to involvement of many stakeholders in wetland usage as they are able to obtain many ecosystem services and multiple values of wetlands. Over-exploitation of some services and conflicts may occur as a result of utilizing wetland services by various stakeholders. Sustainable and multi-functional use of an ecosystem are identified as not only ecologically more sound, but also economically more beneficial to both individuals and society. Hence, sustainable wetland management concept becomes an effective strategy to overcome said issues when extracting benefits from the wetland and to conserve. It includes wise-use of wetland resources at present while conserving for the future generation as well.

Contribution of participatory approaches play a major role when addressing this problem at the policy level. Knowledge generate through the community considering the local context and its conditions for a sustainable wetland management would be beneficial to policy guidance as it facilitates bottom up approach. Participatory approach is an approach of sharing, enhancing and analyzing knowledge of life and conditions of the local people and local society by themselves. Activist participatory research, applied anthropology, rapid rural appraisal,

agroecosystem analysis and field research on farming systems are the sources of this approach (Chambers, 1994). This approach is conceptualized with bottom-up approach since information come out from the local people and local society to act on a particular issue they are vulnerable. Transect walks, pair-wise ranking, well-being ranking and wealth ranking, seasonal calendars, mapping and modelling, analytical diagramming and matrix scoring are the tools that can be practiced to share, enhance and analyze local knowledge at the grass root level.

Application of participatory approaches for wetland management is encountered in the study conducted by Ricaurte *et al*, (2013) that was to deliver aspects for a sustainable management of the Amazonian Piedmont in Colombia. There, ecosystem services that support the livelihood strategies of local people and from the local stakeholders' point of view environmental conflicts related to wetland ecosystem services were identified in order to deliver aspects for a sustainable wetland management. Similar study was conducted for Uchchali wetland complex in Pakistan to initiate a dialogue on the policy reforms where needed local communities to be involved in wetland conservation and management. For an effective wetland management, perspectives of the local communities were essential to minimize conflicts occurring between local community and the conservation authorities in this wetland complex (Pimbert *et al.*, 1996).

Bundala wetland which is being degraded over past years and it is a unique ecosystem rich in biodiversity which is located in Southern, Sri Lanka. In 1990, it was declared as the first Ramsar Site in Sri Lanka and upgraded to a National Park in 1992 (Wildlife Conservation Department, 1998). There are five brackish water lagoons namely; Malala lagoon, Embilikala lagoon, Koholankala lagoon, Bundala lagoon and Maha Lewaya (Abeywickrama, 2010). This unique ecosystem is being degraded due to unplanned development activities such as Lunugamwehera Irrigation Project. Despite the objective of this irrigation project is for contributing development of agriculture in nearby areas, improper planning of this project impacted on the lagoon ecosystem adversely. Hence, at present it is essential to have a long term remedy. Sustainable wetland management plan is an effective strategy which is being applying in many countries in the world. To conserve and protect this unique natural landscape, it is timely required of a sustainable wetland management. In this context participatory approach is highly recognized method to grasp the knowledge and experience of all the stakeholders including local community. Hence, participatory approaches including participatory rural appraisal (PRA) is a useful method to identify the stakeholders' perspectives and their perceptions with regard to wetland management. They are connected with this wetland in various means such as having job opportunities at the saltarn located inside the wetland, do tourist guiding using safari jeeps, involvement of programmes organized by the Bundala National Park (BNP)and the village wetland committees, survive by doing inland fishing and doing paddy farming and chena. Bundala and Siriyagama villages are located within the wetland and Bundala village is one of the ancient villages in Sri Lanka. They are not being able to separate from this environment. Hence, rather having a top down approach, bottom up approach is most applicable and appropriate when attaining sustainable wetland management. Top down approach is not an appropriate approach to represent the ground level activists. In this study, bottom up approach has been applied using participatory mode. Implications for policy or for practitioners must tally with views and opinions of the local community. Unless existing issues would not be addressed properly. Rather considering perspectives and views of an individual, it is most important to have perspectives of a group of stakeholders as a collective effort. Taking these facts into account, this study attempted to ascertain key aspects for a sustainable wetland management with regard to perspectives of the stakeholders' point of view.

Methodology

A focus group discussion (FGD) representing different stakeholders of the Bundala wetland was conducted in Siriyagama which is located near BNP. Lagoon and marine fishers (10), officers of BNP (07), paddy farmers (08) and the members of village wetland committee (10) were the stakeholders of the FGD. PRA was applied to obtain the perspectives and views on sustainable wetland management of the Bundala Wetland with their knowledge and experience accordance to the local context. PRA tools such as resource map, pair-wise ranking and historical profile were used to collect information at the grass root level. All the stakeholders were grouped randomly and they were given activities to be done with PRA tools. Resource map was prepared by one group of stakeholders while considering existing natural resources and important places of the wetland. Two pair-wise rankings were carried out to ascertain what are the aspects they concern in order to attain sustainable wetland management and to identify what are the immediate actions to be needed to protect the wetland from wetland degradation. Finally, the historical profile was prepared by another group of stakeholders to identify inter-temporal changes in lagoon fishing, marine fishing and agriculture in Bundala wetland area.

Results and Discussion

Resource map was prepared by one group of stakeholders participated the FGD. This PRA tool facilitates the community and relevant policy makers to identify and consider available resources and important places located in BNP when planning wetland management plan. Since accurate information relevant to resources come out from themselves, it is advantageous to align with them for sustainable wetland management. Bundala lagoon consists with a well distributed lagoon complex having five lagoons namely; Embilikala lagoon, Malala lagoon, Bundala lagoon, Koholankala lagoon and Maha Lewaya. However, inland fishing is allowed in Embilikala and Malala lagoons with restrictions and registered inland fishers in fishing cooperative societies are allowed to access for fishing in these lagoons. Pathirajaya fishing port, Gange Modara Madel Thotupola and Uraniya Madel Thotupola are the places where facilitate marine fishing.

There is a place called "Pathirajaya" which is identified as an ancient place where the pre-historic ancestors lived. Hence, Bundala village has been identified as one of the ancient villages in Sri Lanka. People living around the Bundala wetland thoroughly believe that this place must be reserved as an historic place. There are two wild life department offices called Udamalala Beat Station and Uraniya Beat Station. Wellangoda and Udamalala are the places where turtle conservation places located. Most of the stakeholders survive from the saltarn which is located in between Bundala and Malala lagoons. Since its income generation, they highlight its importance and value as an asset. Though this community is low educated, they emphasize the importance of protection of natural resources and environment since they fully depend on the environment. Hence, they have the power to involve in the decision making process to guide the policy makers in sustainable manner.

First pair-wise ranking was carried out to ascertain what aspects need to be considered when attaining sustainable wetland management. There are eleven benefits or aspects mentioned by the local community what they are obtaining from the Bundala wetland such as fish production, tourism industry, salt production, farming, job opportunities, herbal medicines, education purpose, biodiversity, fuel wood, self-employments and archeological importance. These benefits directly or indirectly important to their daily life in any means. Lagoon fishing is allowed by the government as it is an income generating activity of the local fishers from the past. After declaring this wetland as a National Park in 1993, certain human activities are restricted to certain degree for public except traditional fishing.

Most of the villagers are having job opportunities at the saltarn. In addition, paddy farming, chena cultivation and tourism related job opportunities such as safari jeep driving and tourist guiding are main income generating activities. Bundala wetland is a well-known bird sanctuary since it is a paradise for water birds specially for flamingos. Due to degradation of lagoon ecosystem in Bundala, their arrival is now being restricted and their popular destinations at present are Elephant Pass, Mannar and Wankalai lagoon. With regard this matter, perspective of the local community is to manage the wetland sustainably and make a comfortable environment for water birds within the Bundala wetland. Hence, all the stakeholders have given priority for biodiversity. For educational purpose, educational programmes have been conducted by the officers of the BNP specially for school children. Main purpose of these educational programmes is to disseminate knowledge of the importance of the Bundala wetland in terms of use values and non-use values as well. The world environment day programme and the world wetland day programme are few amongst them.

Second pair-wise ranking was carried out to identify what are the immediate actions to be needed to protect the wetland from wetland degradation. Proper irrigation activities, improve fishing industry, biodiversity conservation, improve tourism industry, eradication of invasive species and making comfortable environment for birds are among them. All the stakeholders stressed that to have a proper irrigation mechanism due to degradation of lagoon ecosystem with agricultural waste water flowing from nearby paddy fields as a result of Lunugamwehera irrigation project. Invasive species such as Kalapu Andara (*Prosopis cineraria)* and Pathok (*Opuntia dillenii)* have caused main threat to the biodiversity of the wetland. These species rapidly spread over the wetland hindering the growth of other plant species. Hence, eradication of invasive species is a fact that highly stressed by all the stakeholders. Aquatic weeds such as Olu (*Nymphaea pubescens*), Manel (*Nymphaea nouchali*), Salvinia (*Salvinia molesta*) and Water Hyacinth (*Eichchornia crassipes*) cover lagoon surface as well due to conversion of water body of these lagoons. There are five active village wetland committees and they conduct several programmes in order to conserve and manage the Bundala wetland such as beach clean-up programmes and shramdana campaigns. Prime objectives of these committees are to address environmental issues via participatory approaches and develop wetland ecosystem. Stakeholders of this wetland thoroughly believe that implementing these kind of activities would help to conserve biodiversity of the wetland as per their knowledge and experience particular to their local context. They have proper understanding of prevailing situation of the wetland and have their suggestions and views on how this wetland would be managed sustainably. Though they are not the policy makers,

they have the sense of protecting this natural landscape and capable of directing policies with their sense at the ground level.

Historical profile was prepared in the FGD demonstrating the changes in marine fishing, lagoon fishing and agriculture in Bundala area. These changes were stated under three decades namely; 1980's, 1990's and after Tsunami disaster. Though the Bundala area is popular for inland fishing, results of historical profile show that there are 150 marine fishing families are engaging in marine fishing at present. Marine fishers who participated the FGD experienced that there were 600-800 marine fishers from outside in 1980's and fish catch per boat is low at present compared to 1980's. Marine fishers in this area had used destructive fishing techniques to catch more fish in 1990's. Now it has reduced up to a low level. Now they are well-aware of adverse impacts of using destructive fishing techniques. Both marine and lagoon fishers have experienced the change in certain fish species such as mussels, lobsters, lula, korali and prawns at present. According to marine fishers, they have experienced a cold water layer in the sea surface and can see a lot of dead fish since 5-6 years of time period. Population of turtle are reduced as well due to trapping in fishing nets. People living near Bundala wetland highly concern on turtle conservation as there are two turtle conservation sites are located with this wetland.

According to lagoon fishers' experiences, there is an increase of lagoon fishers but fish catch per boat has decreased. No more prawns in lagoons due to change of pH levels of the lagoons though the prawns are prominent fish species caught by lagoon fishers. Bundala is famous for lagoon fishing not for marine fishing but it is not prominent industry at present due to changes of lagoon ecosystem. Paddy farmers use minimum dosage of chemicals for their paddy fields since they have been made aware of adverse effects of over usage. They have experienced a warmer climate at present. They notice the rainfall pattern and rainfall intensity have changed. Hence, they thoroughly believe that these climatic changes have impacts on lagoon fishing, small scale marine fishing and agriculture. Information gathered through PRA tools demonstrate that stakeholders of the Bundala wetland are well-aware of their local context who are capable of involving in the decision making process through participatory approaches.

Conclusions

Sustainable wetland management has been identified as an effective strategy to overcome wetland degradation occurred due to unplanned development activities in the Bundala wetland. Biodiversity, lagoon fishing and eco-tourism have been identified as the main aspects of a sustainable wetland management. Further, community has concerned the ecological supportive ecosystem values rather than the provisioning services of the Bundala wetland. Each and every stakeholder has forwarded their opinions in various means and ultimately came to one platform for providing implications for policy to manage this wetland sustainably. Though the most of the stakeholders are not well educated, they are better enough to take part in the decision making process since they have gone through participatory approaches which facilitate the bottom up approach. This study implies that the participatory approaches are helpful collective effort to address wetland degradation issues in terms of perspectives of stakeholders and their point of view.

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