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# Challenges of Co-Management in Sundarbans

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FORESTRY AND WOOD TECHNOLOGY DISCIPLINE  
KHULNA UNIVERSITY  
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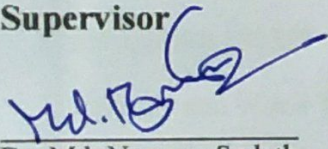


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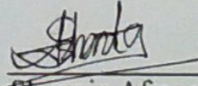
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## DECLARATION

- I'm Sharmin Afroze Shanta, declare that this thesis is the result of my own work that has been carried out under direct supervision of Dr. Md. Nazmus Sadath, Professor, Forestry and Wood Technology Discipline, Khulna University, Khulna and that has not been submitted or accepted for a degree in other university.
- I, hereby, give consent for my thesis, if accepted, to be available for photocopying and for inter-library loans and for the title and summary to be made available to outside organizations.

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**Dedicated**

**To**

**My Beloved Parents**

**and**

**All Honorable Teachers of FWT Discipline**

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## ABSTRACT

In spite of being an exceptionally biodiversity rich country, the forest coverage of Bangladesh is decreasing at an alarming rate. Management of forest in this regard is one of the efforts from government side for providing protection to tackle the loss of biodiversity and ensuring sustainability of the forest. The Sundarbans is the largest single tract of mangrove forest in the world; it is a World Heritage site and supports diversified natural resources. Thousands of people around the Sundarbans rely on Sundarbans for their livelihood. But Sundarban is experiencing many problems since many years. Illicit felling, overexploitation, high pressure on the forest for timber, non-timber forest products and fuel wood-makes the management of the SRF challenging. Apart from these The SRF is facing with very limited infrastructure, manpower and policy support for monitoring and governance. Lack of alternative job opportunities and lack of environmental consciousness is also a problem for management of SRF. Through a few projects some people-centered approaches for managing the forest and alternative income generation are made available but their numbers are inadequate and performances are less satisfactory. Co-management might be one of the effective approaches in this regard. But the Co-management Committee, Co-Management Council, CPG, VCF and the Forest Department are facing with some problems while managing the forest due to governance and proper implementation strategy. Limited resource management, traditional conservation strategies followed by FD, conflicts between FD and CMC, governance, negative attitude of local people towards the CMC, political pressure, rule of games, lack of social learning all are those related challenges of co-management. This study was undertaken at Sundarban, Chandpai (Dhangmari) range and Satkhira range (Koikhali) to assess the regular functionality, effectiveness and challenges of co-management and activities of CMC, FD and NGO to find out the challenges they are facing while playing the role of conserving the forest, reducing degradation of forest and identify the key issues for ensuring the sustainability of forest. Respondents from the local community were selected for discussion. Face to face interview and group discussion were made to collect the required information regarding co-management. People's dependency of forest for livelihood, conflicts is the hindrance for the protection of SRF. Proper policy implementation, monitoring, identification of problem, solving the problem can contribute a lot in co-management as well as forest conservation.

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## **LIST OF ACRONYMS OR ABBREVIATIONS**

<b>SRF</b>	<b>Sundarban Reserved Forest</b>
<b>BFD</b>	<b>Bangladesh Forest Department</b>
<b>FD</b>	<b>Forest Department</b>
<b>CMC</b>	<b>Co-Management Committee</b>
<b>CMC</b>	<b>Co-Management Council</b>
<b>CPG</b>	<b>Community Patrolling Group</b>
<b>ACF</b>	<b>Assistant Conservator of Forest</b>
<b>ADB</b>	<b>Asian Development Bank</b>
<b>WB</b>	<b>World Bank</b>
<b>FAO</b>	<b>Food and Agriculture Organisation of the United Nations</b>
<b>IPAC</b>	<b>Integrated protected Area Co-Management</b>
<b>NGO</b>	<b>Non-Government Organization</b>
<b>PA</b>	<b>Protected Area</b>
<b>GDP</b>	<b>Gross Domestic Product</b>
<b>UNESCO</b>	<b>United Nations Education Science and Cultural organization</b>
<b>WWF</b>	<b>World Wide Fund for Nature</b>
<b>NSP</b>	<b>Nishorgo Support Project</b>
<b>VCF</b>	<b>Village Conservation Forum</b>
<b>PF</b>	<b>Peoples Forum</b>

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background and justification of the study**

Present era is the era of industrial revolution. Industrial revolution is essential for developing a country as well as for the world but it is also responsible for losing the forest cover. Forests are the only protector of us from any kind of natural calamity, global warming, and soil erosion at the same time forests are the provider of tree timber, fuel wood, fruit, flower, leaf, medicine, and edible food for wild animal, honey, wax, natural beauty and serenity. Forests are also the natural habitat of numerous wild animals, birds, insects, flora, fauna, and reptiles. So in every aspects of our life forests are playing important role. The product or things that we use in our day to day life maximum products are comes from the forest. We can survive one second or two seconds without oxygen but we cannot survive one minute without oxygen. Trees are the provider of this valuable oxygen which is necessary for our existence in the world, trees are the life saver and forests are the factory of trees. But it is a matter of great regret that forests are decreasing rapidly due to industrialization, natural disaster, and anthropogenic activities which are not expected. It is necessary to increase the forest cover without damaging the forest.

Bangladesh is a densely populated developing country; population is increasing at an alarming rate in Bangladesh. A country should have sufficient forest cover comparing to its total volume. But we have very low forest cover than our demand. Most of the people of our country are not conscious about the loss of the forest because they are living below the poverty level so meeting of basic needs are paying more attention to them rather than to protect the forest. We need to conserve and manage the existing forest cover and should try every possible ways how to cope with the situation with this low forest cover, how to increase the forest cover, how to reduce forest degradation, how to mitigate the loss of biodiversity, how to conserve the forest resources. Co-management is a very effective way in this regard. It is a medium of natural and cultural resource conservation. Co-management finds out the resource user groups and involves them in decision-making process by sharing responsibilities and benefit, and creates accountability. But there are some challenges or barriers of co-management.



The Sundarbans is known as the biggest halophytic mangrove forest of the world. It is considered as the queen of natural beauty. It is situated in the south west part of Bangladesh in the greater Khulna district. India Shared a little bit of the forest with Bangladesh. The total area of SRF is 6017 square kilo meters and is located in the between 21°30' and 22°30' North and 89°00' and 89°55' East. Land area of SRF is 4113 sq. km and water body of SRF is 1904 sq. km. It is a part of delta which is formed by the river Ganges, Brahmaputra and Meghna. Sundarban is a land of numerous sacred beauties. It is a combination of both floral and faunal diversity. Floral diversity is composed of 334 plant species, 165 algal species and 13 orchid species and faunal diversity composed of 35 reptiles species, 315 birds species, 42 mammals species and 291 fishes species. The world famous 'Royal Bengal Tiger' are found in Sundarban. Tiger, deer, monkey, wild boars, crocodiles, migratory birds are the assets of SRF. SRF has tremendous importance to the people living around it and SRF also plays crucial role in contribution to our national GDP. The SRF provides timber, nypa leaves, honey, wax, fishes, crabs, shrimps which are collected by the local people. Local people's livelihood revolves encircled the SRF. But Sundarban is now in danger created by both natural calamities or other factors and anthropogenic activities. Natural calamities such as cyclones is always a serious threats on the values of the property and along with saline water intrusion and siltation; Over exploitation of timber resources and fauna, illegal hunting and trapping, and agricultural encroachment are also serious threats to the values of the property and its overall integrity. (UNESCO). SRF is also vulnerable to harmful industrial activities and was listed as a threatened global heritage for passing shipping lane and oil tankers through it said by World Wide Fund study report. Recently oil tanker leakage caused a great damage to the water body of the SRF. Numerous water species including fishes, crocodiles and others were died by that occurrence. That also polluted the water body of SRF and caused a great loss to SRF. Full dependency of local people on SRF also creates a problem.

Considering all these things it is urgently needed to conserve the SRF through co-management as it is declared The World Heritage Site and the valuable natural asset of our country. Long term management of SRF is possible only through the active participation of all the stakeholders, aid of the Government and people live adjacent to SRF by applying existing rules and regulations. In co-management expected result is more equitable and recourse conservation baked by resource users, concerned management authorities and associated stakeholders. Governance of SRF can

be successful for long term only when the needs and aspirations of the surrounding local communities are considered in decision-making.

In our country co-management first inaugurated through the conservation of the tropical forest conservation fund agreement. Five pilot forest protected areas were selected for co-management. In the year of 2004 United States first debt for mature funds with a view to protecting and ensuring the biodiversity of the tropical forest in Bangladesh (Khan et al, 2004). Bangladesh was found suitable for co-management approaches as local people depend on forest. With a view to protecting the resources and managing the SRF Government of Bangladesh first time inaugurated co-management project in SRF which aimed at –

- Ensuring sustainability of SRF through conservation of biodiversity of SRF and Surrounding SRF.
- Increasing continuous supply of forest products without damaging the forest.
- Ensuring food security, enhancing ecotourism for appreciating the nature and conserving the biodiversity and providing benefit to the local community through socio-economic activities.
- Supporting of local people in decision making.
- Gradual improvement of co-management activities in SRF.
- For improving a functional co-management model.
- Formation of CMC; Co-Management Committee and Co-Management Council.
- Developing of forest policies for protected area management.
- Constitution of forest user groups and community patrolling groups (CPG).
- Strengthen of institutional capacities of FD and including stakeholders in decision making.
- Infrastructure development.
- Supportive training.
- Development of micro plan training.

A large number of people are living adjacent to Sundarbans and they are dependent on the mangrove ecosystem for their livelihood. Collaborative management or co-management is considered as important tool for good governance in natural resource management system

because it is a transparent approach, further it seeks the resource user groups to involve them in decision making process as well as to increase accountability and sharing of responsibilities. Theoretically there is no problem in co-management but the problem is its proper implementation and applying method. Other associated problem of co-management makes the proper implementation critical. Accountability and transparency is a major thing of co-management for its proper implementation. In SRF, a tree tiered co-management structure has been practicing since 2011.

Various co-management organizations are performing their role in SRF and surrounding landscape. This organization likely the CMC arranges weekly or monthly meeting in order to permit agenda and regular discussion are held for seeking solution to the existing problem. But The FD, VCF, PF, CMC, CPG, NGOs and researcher involved in co-management activities faces challenges for managing the SRF. The study was undertaken in SRF (Chandpai and Satkhira range respectably) to find out those challenges of co-management and possible solution of those challenges.

## **Objectives**

- To find out the challenges of co-management in the study area.
- To find out different stakeholder's opinions about challenges of co-management.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Concept of Co-management

Co-management is playing an important role and being popular in many countries of the world specially developing world by solving different problems or weakness of traditional forest management system of natural resource management. Co-management is recognized as an ideal model for natural resource management system.

Co-management is also called the collaborative management. Co-management means managing things jointly. Collaborative management is "A situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources." (Borrini-Feyerbund, 2000). Co-management can be defined as to manage the forest in a sustainable way through sharing of responsibilities, power and benefit between the Government and the local community. It can also be defined the process of management of forest in which power is shared with resource users by the government and rights and responsibilities related to information and decision-making.

According to World Bank co-management is defined as-'The sharing of responsibilities, rights and duties between the primary stakeholders, in particular local communities and the nation state, a decentralized approach to decision-making that involves users in the decision-making process as equals with the nation state.' (The World Bank, 1999). So from the above two definition of co-management can be defined as-An effective approach which involves different social actors for decision making at the same time sharing of power and responsibilities between the government local communities in a set of natural forest recourses for conserving those recourses and with a view to deriving benefits from those recourses.

There is another definition of co-management which is the most prominent definition of co-management. According to the definition Co-management can be defined as-'A governing arrangement where one or more public agencies directly engage non-state stakeholders in a

collective decision –making process that is formal, consensus oriented and deliberative and that aims to make or implement public policy or manage public programmes or assets.’

Co-management, or the joint management of the commons, is often formulated in terms of some arrangement of power sharing between the State and a community of resource users. In reality, there often are multiple local interests and multiple government agencies at play, and co-management can hardly be understood as the interaction of a unitary State and a homogeneous community. An approach focusing on the legal aspects of co-management, and emphasizing the formal structure of arrangements (how governance is configured) runs the risk of neglecting the functional side of co-management. An alternative approach is to start from the assumption that co-management is a continuous problem-solving process, rather than a fixed state, involving extensive deliberation, negotiation and joint learning within problem-solving networks. This presumption implies that co-management research should preferably focus on how different management tasks are organized and distributed concentrating on the function, rather than the structure, of the system. Such an approach has the effect of highlighting that power sharing is the result, and not the starting point, of the process. This kind of research approach might employ the steps of (1) defining the social-ecological system under focus; (2) mapping the essential management tasks and problems to be solved; (3) clarifying the participants in the problem-solving processes; (4) analyzing linkages in the system, in particular across levels of organization and across geographical space; (5) evaluating capacity-building needs for enhancing the skills and capabilities of people and institutions at various levels; and (6) prescribing ways to improve policy making and problem-solving.

From the definition of co-management stated above some key words are identified related to co-management- responsibilities, decision-making process, social actors or stakeholders, public policy, implementation of policy, resources, management, conservation.

## **2.2 Evolution of co-management**

Evolution of co-management practices for forests and protected areas (PAs) is presented for South Asian region in order to comprehend the present co-management scenario in the region in general and Bangladesh in particular. This follows a review of current patterns of co-managing PAs in six main South Asian countries (India, Nepal, Sri Lanka, Pakistan, Bhutan and

Bangladesh) with a view to discern enabling co-management policy issues and challenges. The relevance of emerging lessons is examined for Bangladesh in order to help decide future co-management priorities for the PAs. Co-management approach is particularly found suitable for Bangladesh PAs that are intimately interspersed with local communities, who practice cultivation and depend on forests for their livelihood. The protection of PAs and constituent biodiversity against biotic pressure cannot be effectively checked without establishing gainful partnerships with local stakeholders. More natural forest areas should be brought under PAs where co-management practices for in-situ biodiversity conservation should be implemented.

The concept of co-management is not an ancient idea it is recently introduced. The terms of co-management is first used by Pinkerton (2003). The concept of power and responsibilities shared in co-management are followed to the earlier time.

Joint Forest Management practices were inaugurated in India in the year of 1972 at West Bengal State for revenue sharing arrangement to replant degraded forest areas (Agarwal, 2001). Co-management of watershed is probably most advanced in the United States. (Brunner et al, 1999) and co-management of river basin in Europe (Pahl-Wostl and Hare, 2004; pahl-wostl et al, 2007)

Kakadu National Park in Australia's protected area co-management is an early concept of co-management but it did not become widespread until in the year of 1990s. (Borrini-Feyerabend et al, 2004). According to Berkes et al, 1991-The early literature depicted co-management as a class of relatively simple partnership arrangement.

### **2.3 Adaptive co-management:**

Adaptive co-management is another form of co-management which is more flexible and more innovative. Adaptive co-management is a dynamic approach to governance whereby there is a combination of institutional arrangements and ecological knowledge are continuously revised through a process of learning by 'learning-by-doing.'

Adaptive Co-Management is an interdisciplinary term and has been defined and conceptualized by several authors. According to Armitage, Berkes, and Doubleday (2007b, p. 328) Adaptive Co-Management as a "process whereby institutional arrangements and ecological knowledge are tested and revised in an ongoing, self-organized and dynamic process of learning-by-doing".

According to Olsson, Folke, and Berkes (2004) dynamic learning occurs via collaboration or what they describe as a 'community-based system' (p. 75). Adaptive Co-Management has also been described as a paradigm of governance that while underpinned by iterative learning, also aims to establish linkages, and share rights and responsibilities between stakeholders (Nancy, 2008). The common theme of the definitions is that learning and collaboration are fundamental aspects of the Adaptive Co-management approach.

Adaptive co-management is a suitable approach where existing governance process is unable to connect with the stakeholders and to take collaborative actions.

Building trust through collaboration, institutional development, and social learning enhances efforts to forest ecosystem management and resolve multi-scale society-environment dilemmas. One emerging approach aimed at addressing these dilemmas is adaptive co-management. This method draws explicit attention to the learning (experiential and experimental) and collaboration (vertical and horizontal) functions necessary to improve our understanding of, and ability to respond to, complex social-ecological systems. Here, we identify and outline the core features of adaptive co-management, which include innovative institutional arrangements and incentives across spatiotemporal scales and level, learning through complexity and change, monitoring and assessment of interventions, the role of power, and opportunities to link science with policy.

## **2.4 Challenges for Co-Management Practice**

- **Accountability of Co-management committees.**
- **Valuation of ecosystem services provided by (Protected Areas) PAs and explores more sources to benefit the society.**
- **Trust and cooperation between agencies and actors of the CMCs.**
- **Linkages between committee members and their constituencies.**
- **Demand/aspirations of the community performing for conservation of PAs.**
- **Effective mechanism for conflict resolutions.**
- **Command and controlling mentality of local elites in committees.**
- **Exploitation of PA resources through empowerment of local community. (Philippe DeCosse, et al. 2012)**



## **2.5 Conservation strategies in co-management**

In case of providing protection of forest resources of SRF it is identified that some part of community are fully dependent on forest resources for their livelihood and some are focusing deep interest to collect forest resources which will further enrich them is oppose move towards the conservation efforts. In order to abate high dependency of forest resources co-management is inaugurated to conserve forest resources by organizing local community for involving them in decision-making process. CMC is functioning the role of sharing responsibilities in co-management system. Government's guideline in 2006 indicates that CMC ensures the management practices of PAs through the active participation of local stakeholders. Co-M management Council observes the activities of CMC and provides guideline for managing the PAs. Between 30 and 100 residents of villages organize to form Village Conservation Forum (VCF) having one-third female members. The VCF elects the Peoples Forum (PF) for each village (one male and one female) of VCF members through election. Community Patrol Groups (CPG) is selected from the villagers and is represented by the CMCs (Rahman, 2016). A portion of income is received by the CMC for community development. Public involvement in Protected Area management and biodiversity conservation are very poor. Protected Area distribution is not adequate for rich biodiversity conservation. Effective co-management that ensures clearly defined rights and responsibilities of various stakeholders on PAs and in active participation in decision-making process is necessary to secure the future of PAs of Bangladesh (Mukul, et al, 2008). Conservation strategies for SRF includes-

- **Strict enforcement of law and community participation for existing forest resource conservation**
- **Stakeholders group formation and awareness rising of NGOs in resource conservation of SRF.**
- **Alternative use of timber and alternative income generation can reduce the dependency of SRF.**
- **Management of SRF is needed for integrated development of forest flora, fauna, wildlife, fish, aquatic resources, timber, nypa palm, honey etc. In order to prevent retrogression of future study ecological succession monitoring should be continued.**
- **Co-management for coastal mangrove forest needs to be initiated.**

- Massive afforestation programme.
- Co-ordination and interaction among FD, NGOs, public and private sector, industries in order to select research project and result of the research project is to be ensured.
- General consideration of National Conservation institution, and functional capacity building of FD.
- Development of eco-tourism to facilitate SRF.
- Ensuring integrated development of all resources including timber, fuelwood, fish, honey, wildlife, aquatic resources by formulation of effective plan and the implementation of plan.
- Plantation enrichment of those selected areas where inundation does not takes place.
- Hardship allowance for FD staff who are engaged in working in Sundarbans.

## **2.6 Resource management in co-management**

The Sundarbans is enriched with rich biodiversity. It is the natural habitat of world's famous Royal Bengal Tiger, apart from tiger's monkey, spotted deer, jungle fowl, lizard and numeric migratory flock ducks are increasing the beauty of the Sundarbans. The tree species of Sundarbans includes- Sundri (*Heritiera fomes*) Baen (*Avicennia marina*, *A. alba*, *A. officinalis*) Gewa (*Excoecaria agallocha*), Garjan (*Rhizophora spp.*), Kankra ( *Bruguiera spp.*), Hental (*Phoenix spp.*) Passur (*Xylocarpus mekongensis*), Golpata (*Nypa fruticans*). The SRF-natural mangrove forest provides charming beauty to the visitors. But this wide range of resource of SRF needs to conserve and the forest needs proper management plan and effective implementation of plan. Management of huge natural resources of SRF is one of the major challenges for FD, CMC and NGOs. FD still facing the want of skilled manpower for monitoring, controlling and regulation of forest resources. Currently total strength of FD is 10,224. Control and monitoring of such large area of SRF is not easy due to access of intruders from all sides. There is a need of realization of human resource planning enabling the FD to retool its working force for the safe guard the country's dwindling forest (Rahman, 2011a). Additional problems for FD in resource conservation are overly lengthy administrative procedure, civil litigation, lack of policy, political commitment, lack of co-ordination between FD and CMC.

## **2.7 Conflict management in co-management**

Huge resources of SRF under the management practices of FD and CMC sometimes leads to create conflict. Disputes among interest holders sometimes grow into major conflicts. Where there are resource uses opportunities and interest groups there will be possibility for occurring conflict. As observed by Ayling and Kelly (1997) there are more 'resource frontiers' in the world and virtually every change of land use or expansion of resource use tends to involve conflict-be it between nations, regions, districts or individuals. In an area if there are NGOs, private companies or other private actors show interest for management of resource uses and conservation along with providing benefits will not all the time appreciated by the local community will often not be successful for motivating those peoples because the activities go against their interest, ideas and opinion. Conflicts is sometimes created within the community and with the outsiders but all the time conflict doesn't bring the negative impacts to the environment sometimes conflicts may lead to positive changes to the environment and to the society. Actually conflict is a part of dynamic society; it may be positive or may be negative. But can affect the conservation activities if it is not managed in a systematic way.

In some cases, local tradition is followed by the interest groups for handling conflicts without government intervention. The guidelines which are helpful for conflict management are formulated specially to conserve planners by the foundation of the South Pacific International (Tapisuwe et al., 1998), an organization working the participation in conservation in Vanuatu (FAO, 1994; Buckles 1999).

Solutions of conflicts are stated below:

- **Proper planning for solving conflicts.** Serious consideration of the planners about complaints is needed. Discussion for solving the conflict. All complaints should be taken seriously by planners. Listening to the concerns from both sides, and to fully understand the concerns, repeating them in own words after listening. Consideration about the best time and place to discuss complaints. In many societies women are not expected to speak up in public hearings and other groups, such as poor or non-land owning individuals, may well, for their own reasons remain silent during hearings.

- It is significant to bring special consideration of the underlying issues for solving the conflict and measure to solve the conflict. If there are many problems or underlying issues that need to be dealt with, it is a good idea to prioritize them in terms of (a) magnitude (the amount of people, land, trees affected by a problem), and (b) importance (the impact a problem may have on different stakeholders).
- Encourage all stakeholders to look for positive solutions to any conflict they meet. Think about how to compensate those who are affected by a problem.
- Discussion about the issues with the stakeholders is needed for solving the conflict.
- Discussion and modification of the options until everyone can accept the solution. It should be noted that these guidelines depend on the voluntary participation of all relevant interest holders. Cultural conditions, including people's interest to acknowledge a conflict that will make the guidelines that is more or less effective in different parts of the world. If the conflict-mediating process suggests that only certain stakeholders are brought together, while the real causes of conflict remain beyond the mediator's control, the process might in fact be counterproductive because people are likely to experience it as futile.
- Consideration about how to compensate the people who are affected by the problem.

## **2.8 Participation of people in co-management**

People's participation in co-management creates the opportunities to manage the forest resources sustainably. But most of the people are less aware about the proper management of forest and the opportunities are few due to lack of awareness for different social and economic problem, and complicated procedure. Providing forest dependent people clear access to forest resources and opportunities to legally exploit them could provide incentives for maintaining forest cover (Eliasch, 2008).

## **2.9 Security of land tenure and user rights in co-management**

Lack of secure land tenure or forest user rights is a major reason why local people do not commit themselves to participatory forest conservation. As is to be expected, people without such rights experience a lack of a predictable future and a diminished willingness to invest labor and care in the forest. Once local people gain land or user rights, however, they often take an active interest in forest conservation. The government's decision to change their status from illegal settlers to legal participants in forest management was a turning point. This provided the spark for increased community and resource mapping and conservation efforts. In Africa, according to a comprehensive literature survey by Shepherd (1992), effective in situ conservation is almost solely on lands under legally acknowledged ownership. In Melanesia, undisputed ownership to forest resources is seen as a prerequisite for replacing exploitative logging practices (Kuata *et al.* 1996).

In many countries, local groups have their own customary forest rules and regulations. By formally recognizing such rules, governments can greatly motivate local people to participate in conservation efforts. Official recognition of customary law can, however, be a complex issue. The legislation of some nations, for example, might not permit formalization of communal land ownership and customary laws of indigenous people. Considering the economic value of forests and the often fierce competition over access to forest resources, the question of granting tenure or forest user rights to local people is a highly controversial matter in many countries. This is partly because user rights in themselves provide no guarantee that 'new' private or communal land owners will manage forest resources in ways

## **CHAPTER THREE**

### **MATERIAL AND METHODS**

#### **3.1 Selection of the study area**

The study was conducted in Chandpai range and Shatkhira range in Sundarbans. Chandpai range is under Mongla Upazilla of Bagherhat administrative district. The world's largest mangrove forest Sundarbans lies under two forest divisions, and four administrative ranges viz Chandpai, Sarankhola, Khulna and Burigoalini. (Protected Area) PA of Chandpai range is 11,714 ha.

#### **3.2 Methods of Data Collection**

Required data are collected from review of relevant documents of co-management and through the interview of FD, CMC and CPG members of Chandpai and Satkhira range, Sundarbans. NGOs, researcher to know about the existing challenges of co-management in Sundarbans. Chandpai CMC (Co-Management Committee) was formed at 4<sup>th</sup> february, 2010 and it is consists of 27 members (22 male and 5 female) and Chandpai CMC (Co-Management Council) consists of 12 members and Shatkhira CMC (Co-Management Committee) was formed at 11 November, 2009 and consists of 29 members (24 male and 5 female).

#### **3.3 Content Analysis**

Content analysis can be defined as the process in which elevating social reality with a manifest text and within a non-manifest text. According to Krippendorff (1980) content analysis is the research technique for making explicative and valid inferences from data to their context. According to Neuman, content analysis is the most appropriate method for revealing the exact, objectively significant, text, word or symbol from a large volume of text. (Neuman, 2006). Published literature, various thesis paper and journal etc. are considered the documents of challenges of co-management. Review of relevant documents is used to collect the required data, focus group discussions and face to face interview were made in each study area to collect the data.

### **3.4 Socio-economic analysis of challenges of co-management**

Socio-economic analysis is conducted for identifying the past and present challenges of co-management and assesses the policies and adequate actions to mitigate the existing challenges of co-management in SRF. Socio-economic analysis follows the following steps stated below:

- Analysis of socio-economic dynamics and existing challenges of co-management.
- Identification and description of existing challenges of co-management.

### **3.5 Research strategies**

Qualitative assessments are involved in research and for analysis of data and for the representation. Qualitative research is a broad field for enquiry that follows unstructured data collection method that includes observations, interviews, survey, and document. Qualitative research tends to try to covers the reasons of behavior, attitudes and motivations instead of dealing with what, where and when. Data were collected from the study area by field survey.

Qualitative Research is also indicates to uncover trends in thought and opinions, and dive deeper into the problem. Qualitative data collection methods vary using unstructured or semi-structured techniques. Some common methods include focus groups (group discussions), individual interviews, and participation/observations.

### **3.6 Unit of analysis**

Divisional Forest Officer, CMC and CPG members of the study area, NGOs and researcher were the unit of analysis for completing the research and considered as the unit of analysis for the research.

### **3.7 Questionnaire designing**

An open ended questionnaire was designed and checked for several times in order to make field survey. Before making questionnaire extensive literature review was conducted for making the questionnaire appropriate ensuring the avoidance of any types of digression from the objectives of the study.



### 3.8 Data collection

Data collection was done through the following ways-

#### 3.8.1 Primary data collection

##### 3.8.1.1 Interview

In order to collect the required information about the challenges of co-management of the research area face to face interview of the DFO and other respondent, such as CMC and CPG member, NGO worker, researcher (as per question) were conducted. The first technique was the respondents were given a short brief by the interviewer so that they can realize the topic well and can provide sufficient information. The interview was frank, spontaneous, tactful and no rigid to make the respondents guileless. Interview was flexible followed by the key issues that were raised by the respondents to obtain clear concept about the challenges, weakness, and threats and solution of the existing and future challenges for achieving sustainability of forest on co-management at the research area.



**Fig: Photographs of interview from the respondent (NGOs)**



### **3.8.1.2 Group discussion**

Focus group discussion was carried out with the participation of CMC, CPG, VCF, NGOs groups to express their ideas, views, thoughts, opinions and their perceptions. From each of the study area groups were formed by the community leader of the study area for discussion.



**Fig: Photographs of Group discussion (Chandpai and Shatkhira CMC)**

### **3.8.2 Secondary data collection**

Different sources of secondary data collection were used to collect the secondary data for the study. Adequate literature, internet sources, newspaper, government offices such as Forest Department was the sources of collecting the secondary data.

### **3.9 Data processing, analysis and interpretation**

By following the objectives of the study adequate data that were collected were compiled, tabulated and analyzed. After the collection of data the interview schedule were transferred to a master sheet for facilitating the tabulation.

### **3.10 Report preparation and presentation**

The analyzed information that was obtain from the research conducted in the study area according to the questionnaire and objectives of the study represents the final report which is called the thesis paper. Final report has been prepared based on analysis of the information.



## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Results and Discussion

After the analysis of different relevant articles and field data important challenges of co-management in Sundarbans are identified. Those identified challenges are also the indicator of improper management and unskilled design of co-management model for Sundarban Reserved Forest. Theoretically or in written agreement there is no problem, co-management is considered as a very transparent and effective approach but the main problem is lack of proper implementation. Improper implementation of co-management approach in SRF raises the challenges which will be the barriers to achieve the management objectives in near future rather than to conserve it. From interview, group discussion and field data analysis it is found that there is a communication gap and lack of combined activities among the actors. Major challenges of co-management in Sundarbans from different respondent's point of view can be showed by a graph-

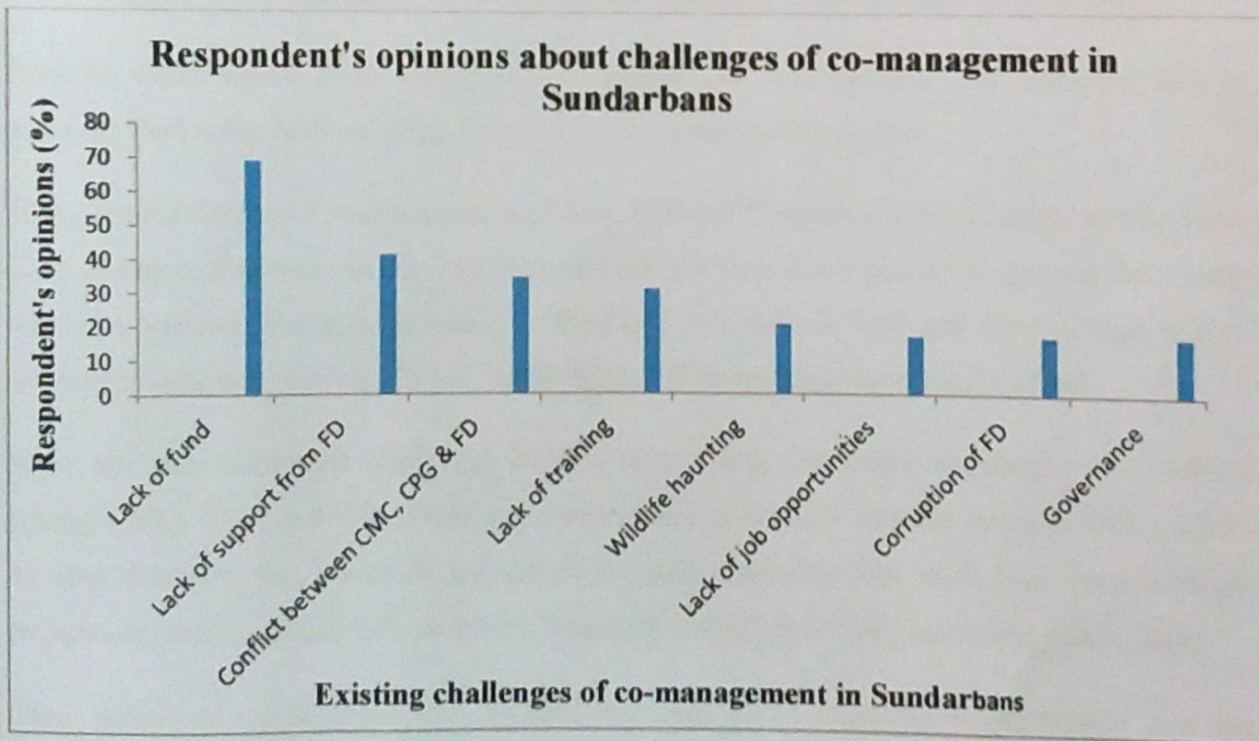
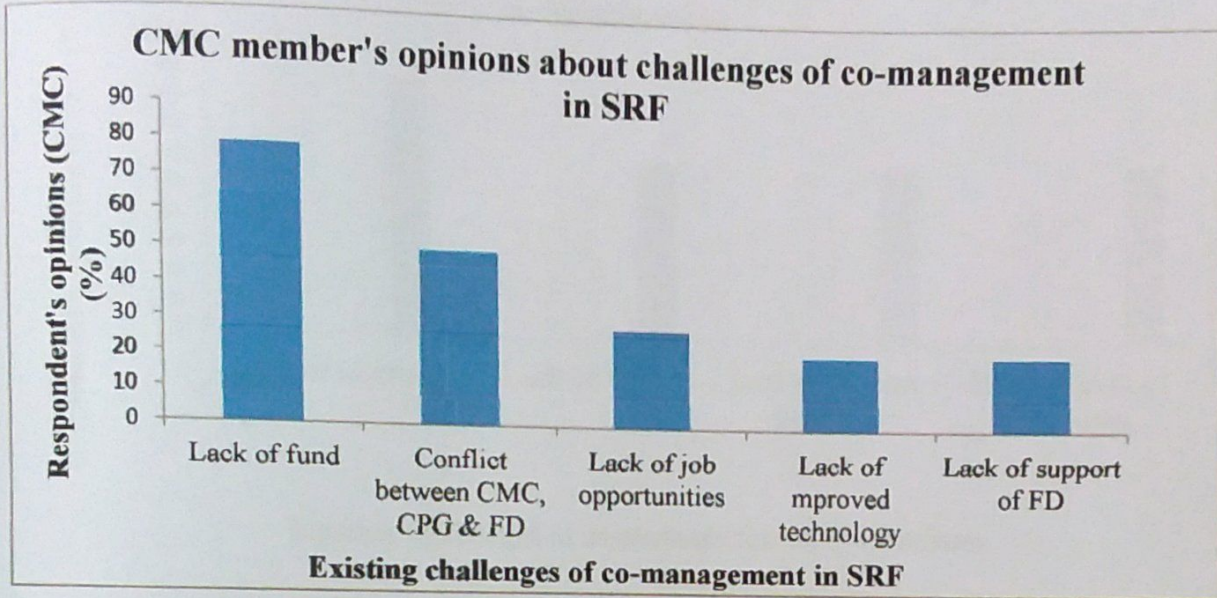


Fig 4.1: Important challenges of co-management compared with the respondent's opinion (%)



## 4.2 Actor wise analysis of result

### 4.2.1 CMC member's opinion about the challenges of co-management in SRF



**Fig 4.2 CMC member's opinions about challenges of co-management in SRF**

From the above figure, CMC members of Chandpai CMC and Satkhira CMC think that lack of adequate fund is the main problem for them in co-management activities.

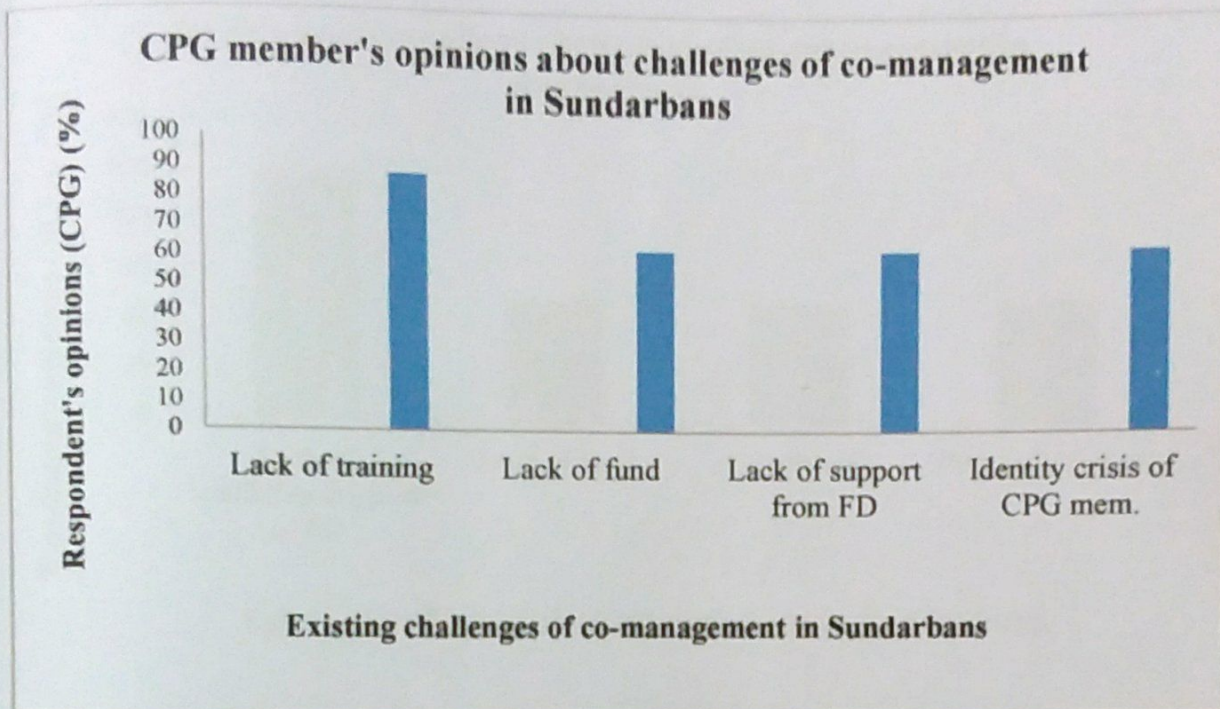
They demand the fund to continue the activities. 80% CMC member of both Chandpai and Satkhira CMC demands that they do the volunteer service and they don't get any wages for their work and have positive mentality to conserve the forest but lack of fund and there is high risk to extinct the volunteer service of CMC when there will be no donor for providing fund.

There are also associated challenges besides fund. Other two major challenges are conflicts among CMC, CPG and FD (50%) and local people's negative attitude towards CMC. CMC member demands that FD staffs are not cordial and supportive and some local people shows negative attitude towards CMC members local people think that CMC has stopped their pass.

Other additional challenges CMC demand that they don't have the transportation cost for attending the meeting, lack of improved technology (smart phone), lack of cordiality of FD, Corruption of FD, lack of awareness among the local people, lack of alternative job opportunities, haunting of wildlife (specially tigers and deers).



#### 4.2.2. CPG member's opinion about the challenges of co-management in SRF



**Fig 4.3: CPG member's opinions about challenges of co-management in SRF**

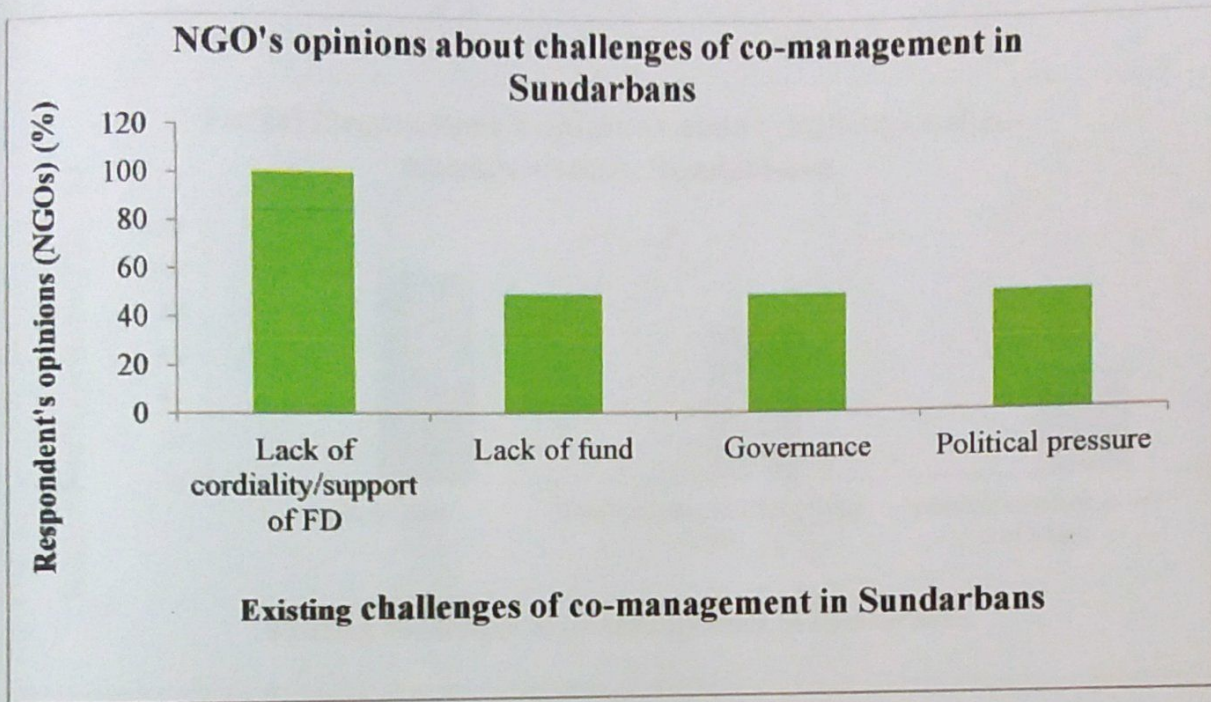
Figure shows that, lack of adequate training is considered the main challenges for CPG members (90%). CPG members of both ranges demand that they have lack of training facilities and they are not allowed to patrol inside the forest (especially deer haunting) so they don't get the information of forest offences.

Secondly, lack of fund (60%) lack of cordiality or support from FD (60%) and identity crisis (60%) has also the priority and also considered as the barriers.

They also demands that they have lack of instrument such as: Torch light for patrolling, weapon, medicine, dress, meeting room facilities etc. and they are not secured while working sometimes physical torture and threats from the thief and haunter makes challenges and their life risk.



### 4.2.3. NGO's opinions about the challenges of co-management in SRF



**Fig 4.4: NGOs opinions about challenges of co-management in SRF**

NGOs associated with co-management activities perform the role of providing training, alternative job opportunities, fund and support. Lack of cordiality and support from the FD (100% in the figure) is considered the main challenges for NGOs. FD often neglects their work and not supportive. Then lack of fund, corruption in CPG camp, Governance and political pressure from local dominant leader are also considered as challenges.

NGO worker also thinks that lack of awareness among people and skilled person and lack of proper planning makes the activities critical.



#### 4.2.4. Forest Department's opinions about the challenges of co-management in SRF

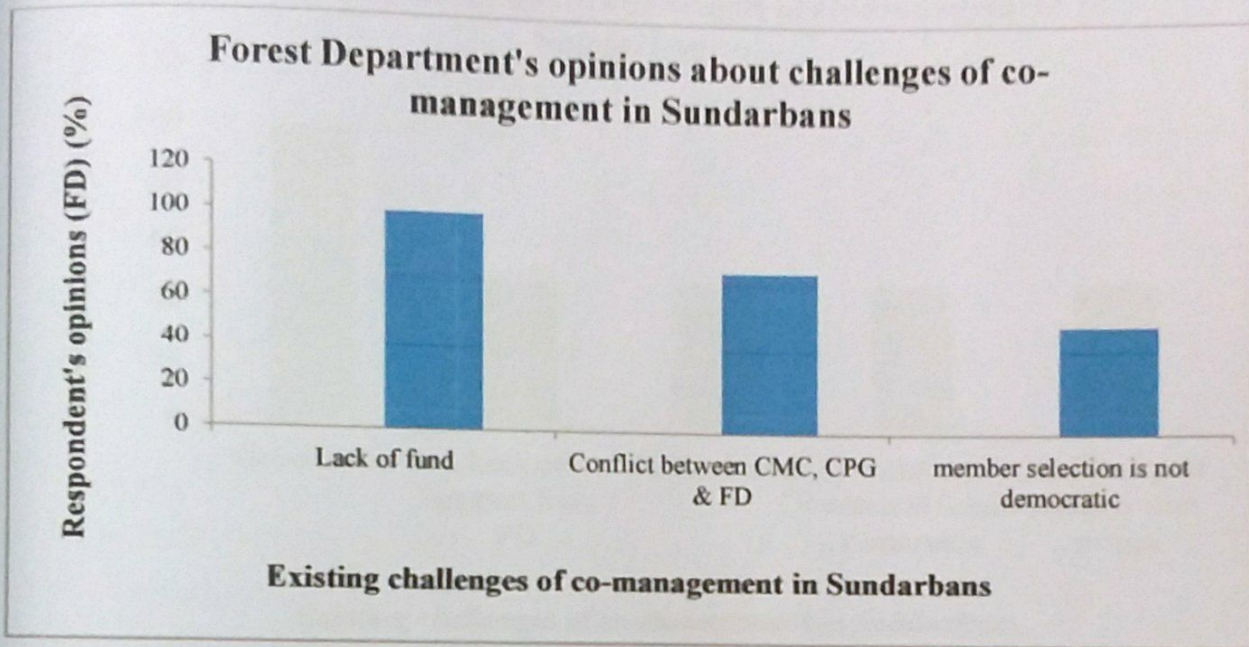


Fig 4.5: Forest Department's opinions about challenges of co-management in SRF

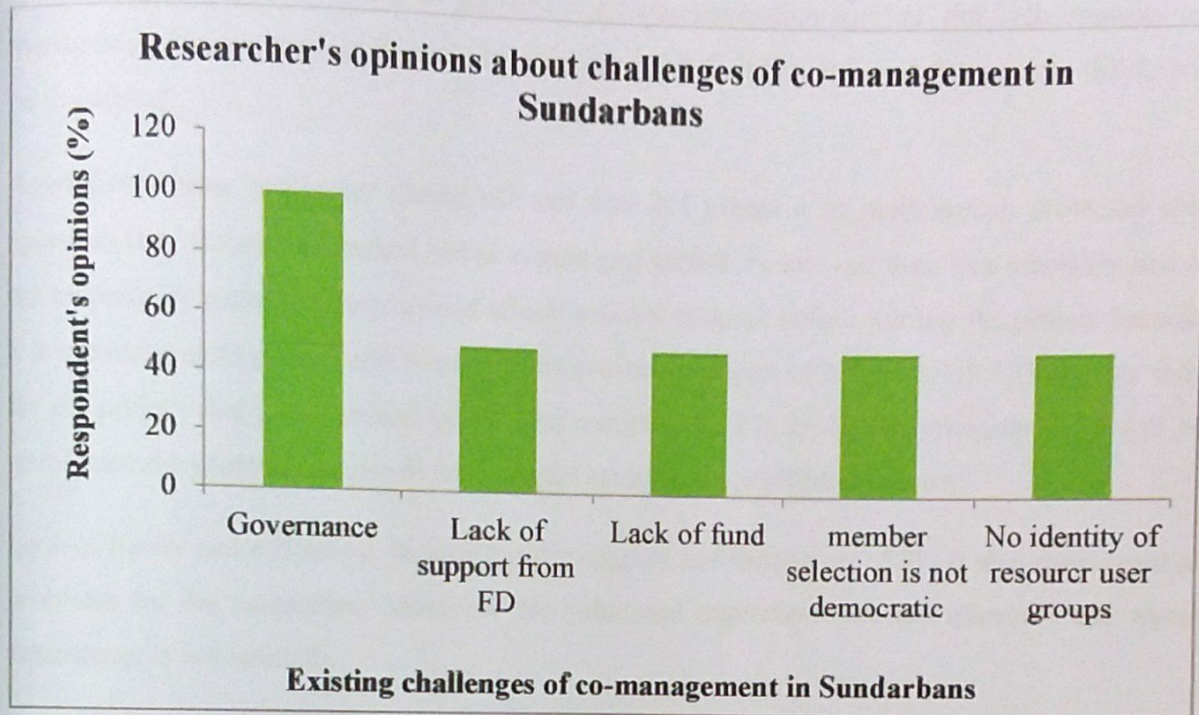
Firstly, lack of fund is the main challenge for co-management in Sundarbans Forest Department's opinion (100% in the figure)

Secondly, conflicts among CMC, CPG and FD (80%) and lack of democratic process in member selection (60%) are the major challenges considered by Forest Department. Financing and budgeting is the main problem for co-management activities.

Apart from these Forest Department thinks that, resource user groups are not identified properly and every there are planning in ever year but there is no proper implementation of the planning.



#### 4.2.5. Researcher's opinions about the challenges of co-management in SRF



**Fig 4.6: Researcher's opinions about challenges of co-management in SRF**

From the above figure indication goes to governance (100%) as the main challenges of co-management from the researcher's point of view. Good governance indicates accountability, transparency, joint decision making and implementation. But those things are only in written agreement there is lack of lack of accountability and transparency. FD, CMC and CPG complains against each other but both of them are involved in corruption and illegal activities and in case of decision making the decision maker at the top level has the priority to take any decision but stakeholders at the grass root level cannot participate to take the decision or their opinions are neglected. There is no proper implementation of planning. Though co-management is considered as a very sound system of resource conservation but in respect of Sundarbans the problem related to its application.

Additional challenges from researcher's opinions are lack of fund or budgeting, lack of cordiality or support from FD, member selection is not democratic and no identity of resource user groups (more than 40%). Socio-economic status of the neighboring communities of SRF is another challenge of co-management (from researcher's opinion if the neighboring communities are

needy there will be a chance to destroy the forest for long-term management) and full dependency of SRF due to lack of alternative income generation sources. For high intensity co-management human interference can hamper the wildlife it is another challenge so wildlife will be threatened.

Apart from these, researcher thinks FD still couldn't accept it as main stream protected area approach they follows command based system and couldn't come out from this mentality due to the preparatory activities they needed which was not adopted before starting the project because it is a development project and foreign aided project (a project of USAID). USAID donates fund for the project that is patronized by FD and ministry. So FD thinks that when the fund will be terminated the protected area will be managed again by the traditional system.

Lack of equity and efficiency, lack of logistic support and manpower of FD is also considered as problems by the researcher. Moreover the rules and regulations are not adequate and forest department is not strength.



4.2.6. Major existing challenges of co-management (comparison among different respondent's group's opinions)

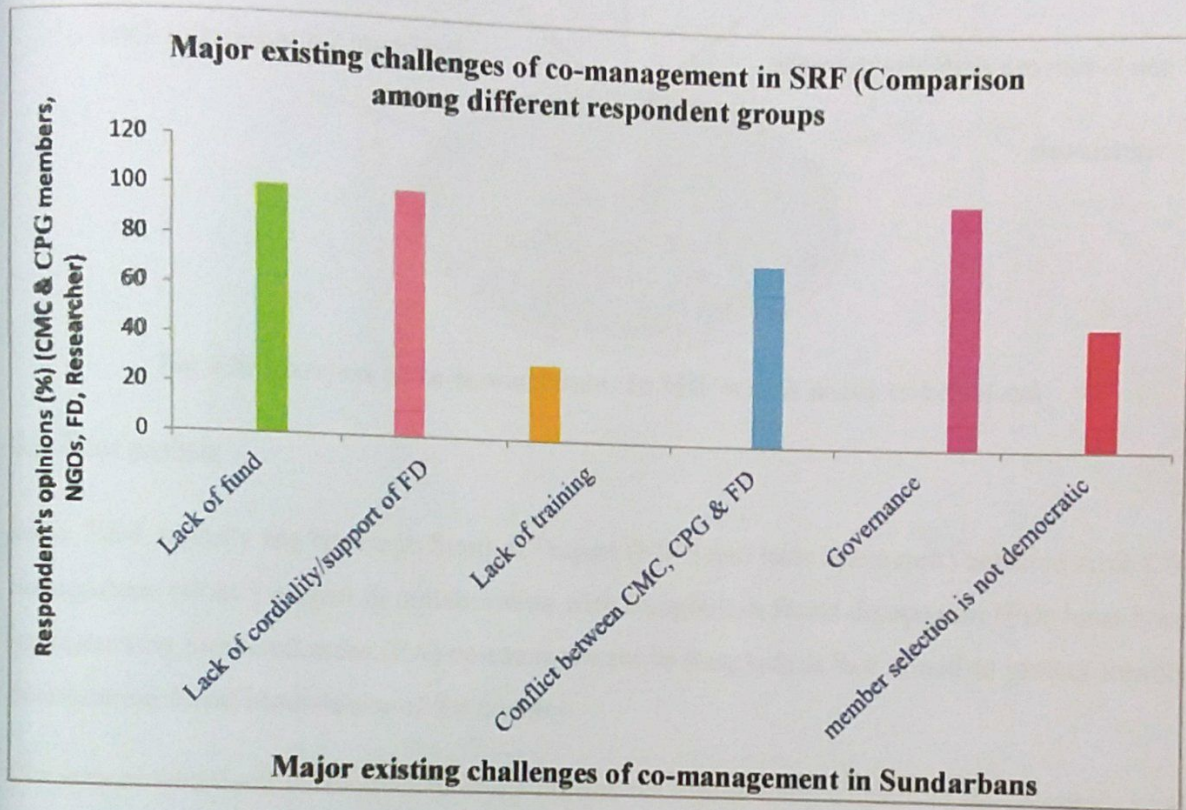
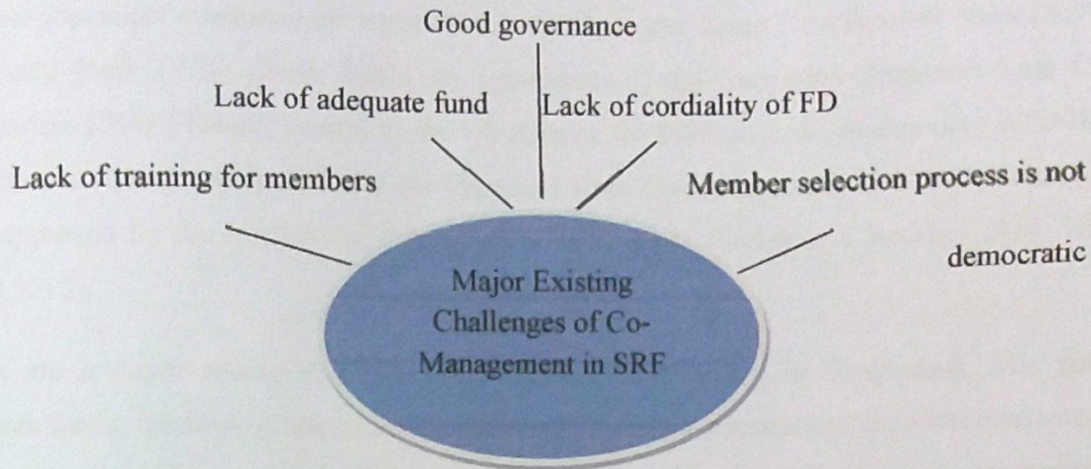


Fig 4.7: Identified major existing challenges of co-management in Sundarbans (comparison among different respondent's groups)

Figure shows that, 100% opinions go to lack of fund, lack of cordiality or support from FD and governance. 80% opinions for conflict among CMC, CPG and FD, 40% opinions for no democratic process are used in member selection and more than 20% opinions for lack of training. So from the above figure that, funding and budgeting problem, lack of cordiality of FD and Governance are the existing dominant challenges of co-management in Sundarbans which needs to be solved immediately.





**Fig 4.8: Barriers of co-management in SRF which needs to be solved**

### 4.3 Discussion

Since 2004, initially the Nishorgo Support Project (NSP) and later Integrated Protected Area Co-management (IPAC) project in collaboration with Bangladesh forest department (FD) have been implementing protected areas (PA) co-management in Bangladesh that aimed to protect rapidly deteriorating forest biodiversity of the country.

The area of forestland in Bangladesh is 2.5 million ha, representing 17.08% of the country's total land area, of which 1.53 million ha is managed by the BFD (Ahmed et al. 2007, FAO 2011, Sarker and Rodrigo 2014), and the remainder by district commissioners (Sadath and Krott 2012, Sarker and Rodrigo 2014). According to FAO statistics, declines in Bangladesh forest cover from 1990 to 2011 create major threats because of biodiversity loss, decreases in timber and non-timber forest products, human-wildlife conflicts, deteriorating environmental conditions, and reduced forest ecosystem services (Sarker and Rodrigo 2014). Additionally, climate change has aggravated existing stresses (Sadath and Krott 2012). In order to address this, the GoB has shifted its policy to emphasise community-based forest management and sustainable development. It has adopted a community forestry approach, as established in the Forestry Master Plan completed in 1993, the revised Forest Act of 2000, and the Social Forestry Rules of 2004, amended in 2010 (BFD 2015). This has facilitated collaboration between the GoB, through the BFD and local communities in enhancing conservation while striving to meet local people's consumption needs (ibid). The 1990s witnessed a significant milestone for community forestry in Bangladesh, with the BFD beginning CF management activities that involved active participation

by forest-dependent communities, using foreign aid from the Asian Development Bank (ADB) and World Bank (WB) (ibid). Based on experience of the Integrated Protected Area Co-management (IPAC) Project funded by the US Agency for International Development (USAID), the BFD then developed draft Rules for Protected Area Co-management in 2011, currently is being approved by the Ministry of Environment and Forests (Sarker and Rodrigo 2014, UN-REDD 2012).

Forests are a major source of energy and livelihood for people in Bangladesh. The main challenge facing the forestry sector is a deficiency of financial resources to support initiatives to sustain the environment, natural resources, and communities. The Bangladesh government (GoB) therefore adopted a CF approach to address the primary drivers of deforestation and forest degradation, and to promote people's participation in improved forest resource management (BFD 2015). However, in most developing countries, lower-level community actors have not been empowered appropriately in forest management (Krott et al. 2014, Ribot et al. 2006), and Bangladesh is no exception (Chowdhury et al. 2009, Jashimuddin and Inoue 2012, Rashid et al. 2013).

Healthy mangrove systems in Bangladesh not only support meeting the economic needs and fishery resources but also protect lives and properties from natural disasters. The SMF green cover has been standing firm against natural disasters for ages. Its vegetation consists of 64 plant species, which have the capacity to withstand estuarine conditions and saline inundation and can face strong winds (Rahman & Rahman, 2015). Furthermore, The SMF's triple tier natural protection mechanisms protect the islands from cyclonic storms originating in the Bay of Bengal (Miyani, 2012). Hence it is necessary for stakeholders to use SMF resources sustainably. Here are some

recommendations for sustainable use of SMF resources, which will eventually improve the socioeconomic conditions of the artisanal fishermen in the SMF:

Public support and community participation are the primary requirements of successfully establishing of any system. Hence, adaptive management systems (like community-based fisheries management or co-management) should be developed for better understanding of the social-ecological system of the SMF.



In structuring management systems and policy implementation, socio-economic and cultural heterogeneity should be addressed. Furthermore, attention to the local politics, religion, education level and influence of the local authority on the management plan should be considered, as all these components play direct or indirect roles in policy implementation.

As a developing country, the forest resources of Bangladesh are under serious threat of degradation (Chowdhury et al., 2009), but the country is committed to conserving them and is a party to the relevant international agreements (e.g., CBD, CITES, UNFCCC, UNFF, UNCED, etc.) (Rahman and Giessen, 2014; Sadath and Rahman, 2016).

The polders and the adjacent area are the property of the Bangladesh Water Development Board. These polders have a significant role in the socio-environmental situation of the southwestern region of Bangladesh. The presence of the Sundarbans on opposite bank of the rivers makes this situation more important in terms of biodiversity context. Additionally, it is very common to find landless people as settlers along the polders in these particular regions. Although the land belongs to the state, these areas are used as common-pool resources. Hence multiple level stakeholders/actors are involved in the management of the polder areas particularly in respect of plantations. As GIZ has taken a pilot project for the conservation of biodiversity along the polder area in a participatory way, it is imperative to have a stakeholder/actor analysis in terms of interest and power in the pilot area. This study has done the complete network analysis in seven unions (Suterkhali, Rayenda, Southkhali, Ramjannagar, Munshiganj, Burigoalini, and Shyamnagar) of three upazilas (Dacope, Sarankhola, and Shyamnagar). The study found that the local government, local politicians, local beneficiaries, local elites, local NGOs, and upazila administrations are the irreplaceable stakeholders at local level. Water development board and forest administration are the two other irreplaceable actor at national level. These actors dominate the interest power network of participatory biodiversity policy program in and around Bangladeshi Sundarbans. Additionally the present co-management strategy of Bangladesh also advocates in favor of the administration-dominated institutions. (Sadath M.N, et al, 2017)

Figure 4.2 shows that insufficient fund (80%) for the CMC members make their work critical. Inadequate fund for CMC members is a big challenge for performing the activities of co-management in Sundarbans.

From the figure 4.3 CPG members think that lack of training (90%) for them is the main challenge of co-management in Sundarbans they also demand that, even they don't get sufficient instruments for patrolling besides training.

Figure 4.4 indicates that, NGOs concerned with co-management activities in Sundarbans consider that, most of the time Forest Department is not supportive (100%) to them.

Figure 4.5 indicates that, Forest Department also considers insufficient fund (100%) as a major challenge of co-management in Sundarbans. Conflict among CMC, CPG and FD sometimes creates problems and hampers combined activities.

Figure 4.6 indicates that, Governance (100%) is the main challenge for co-management in Sundarbans considered by Researchers. Good governance means accountability, transparency, joint decision making and proper implementation but there is a lack of combination of those things for co-management in Sundarbans. FD officials, CMC and CPG members are involved in illegal activities but they are not accountable to each other.

From fig 4.7 it indicates that, major existing challenges for co-management in Sundarbans are insufficient fund for different co-management organizations (100%), lack of support from FD (Forest Department) (100%) and governance (100%). Moreover the process of member selection is not democratic (60%) and provision of training for the members is not adequate (40%).

Co-management approach is accepted worldwide as a very sound approach. The existing co-management system of SRF is facing with many problems because the existing governance system is not functional. The research was undertaken to find out the challenges and recommended solution to overcome the problem. As it is compared traditional protected area management to co-management so there is no alternative to co-management. For protecting the forest from illicit felling co-management is necessary. It is proved that traditional protected area management system has already failed and co-management is considered as a new approach and



which can be a successful method for managing the forest if the barriers are identified properly and the possible solution are ensured.

As there is no problem of co-management theoretically so it can be hoped that if it is implemented properly it will ensure the sustainability of SRF and long term management of the resources of SRF is possible through collaborative management. But if it is not possible to overcome the identified challenges of co-management in SRF then the situation will be more critical and it will be more vulnerable and will be a serious threat to the PA compared to traditional protected area management system. Because in traditional area management system FD was the concerned authority to manage the forest resources but now the rights has transferred also to the resource users, so from both sides illegal activities are occurring because they are not accountable to each other which are not expected. So it is urgent to adopt the measures to overcome the challenges of co-management in SRF otherwise it will be a serious threat to be gradually destroyed rather than to protect the forest.

# CHAPTER FIVE

## CONCLUSION

### 5.1 Conclusion

Co-management was started in developed countries to mitigate the conflicts between main stream people and indigenous people and finally the resource management right is transferred over the indigenous people. In many developed countries forest is successfully managed by co-management system and they have the positive results, they have benefited by co-management; from that philosophical point of view co-management has started in our country as well as in SRF but apart from the benefit associated problems are arising which are making the situation more challenging. Some people have benefited through the approach but it couldn't bring benefit to the entire community.

In Bangladesh the existing laws are not very effective and the laws are not sufficient for conserving the biodiversity of protected areas and it couldn't stop the steady loss of biodiversities in protected areas. The gradual losses of biodiversity in protected areas are not only the results of conflicts among different organizations and FD but also for institutional failure.

Consultation mechanisms must be activated to resolve two intertwined problems: One of conflicts and one of sustainability (e.g sustainable environmental resource use). Such consultation mechanisms, emanating from bottom-up, cross-sectional participation and collective action at micro and meso levels have been widely adopted. Community based management, co-management initiatives (featuring prominently in coastal fisheries management) and the constitution of organizations promoting environmentally sustainable use of coastal resources (e.g Arriaga et al., 1999 for Equador; Masalu, 2000 for Tanzania; Rouf and Jensen; 2001 in case of Bangladesh Sunderbans). Criteria for successful collective action in managing common resources are not new (Olson , 1971; Ostrom, 1990): reasonable group size, homo geneity of participants and agreed purpose are conditions for the successful organization of stakeholders in associations, cooperative or resource user groups for collective action at local level.

Active participation of local people is a must otherwise there is a little chance for success of those initiatives. But In Bangladesh context it is not so easy to involve local people in such

efforts as financial benefit or cash for their involvement is required by them. So, if the barriers are not identified properly and possible solution are not ensured (financial viability, governance training, designing and implementing) co-management for protected areas have a little chance of success.

## 5.2 Recommendation

- Governance should be ensured if governance are not ensure then ultimately there will be no change and achievement of expected result or desired goals will not be possible. So there is no other way to governance. Accountability for the activities of FD, CMC, CPG, VCF, PF, should be ensured, there should be transparency, decision making should be in a way that all the stakeholders from the grass root level to the top level should be treated equally and there should be no discrimination and finally proper implementation is necessary.
- Adequate funding source is urgently needed for CMC, CPG, VCF, and PF. More rights should be provided to CMC in lieu of merely consulting with them only to the issues around the forest. Ambiguity in revenue sharing process should be removed.
- Forest Department should be cordial towards the CMC, CPG and NGOs. FD should provide logistic support and should come out from their negative mentality and they should appreciate any good activities.
- Conflicts should be mitigated through mutual understanding and discussion; underlying issues should give the priority and try to solve the problem.
- Alternative income generation sources should be provided for uplifting the socio-economic status of neighboring people because if they are needy they will play the negative role there will be high risk to destroy the forest by them because they are fully dependent on SRF. So alternative income generation source is urgent.
- Adequate training facilities and instrument of CMC and CPG member should be provided, room facilities for arranging meeting for the VCF, CMC and CPG members should be provided.
- Corruption of FD staffs must be stopped and investigation is needed in this regard
- Rules and regulation should be updated.
- Awareness buildup and empowerment of the local community should be ensured because objectives of co-management are both management and conservation.
- Motivation of people and their active participation is needed when people will be motivated and will be realized the importance of forest they will be encouraged to conserve the forest.

- Knowledge about forest offences should be provided to the people.
- Change of political culture is necessary.
- Resource user groups should be introduced.
- Moreover proper planning, designing of co-management model and effective implementation should be ensured.

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# APPENDIX

## Focus Group Discussion Checklist

### Study on Co-management committee's, Community Patrolling Group's & Forest Department's activities and impacts

*The study is framed to assess the extent of FD, CMC and CPG's regular functionality, effectiveness in conservation of SRF regarding co-management and reducing forest degradation and identify key issues for ensuring sustainability.*

#### Part A.

##### A. Basic information:

Name of the PA:

Area of the PA: ..... ha

Forest beat:

Forest Range: .....

Name of CMC:

Month & year CMC first formed in this area (mm/yyyy): .....

Name & cell of group leader: ..... Cell: .....

Members (current, Nov/2017): ..... Male: ..... Female: .....

Members at formation: ..... Male: .....Female: .....

##### B. CMC/CPG Functionality:

**What are the activities of CMC/CPG/ in forest conservation?**

.....

.....

.....

.....

**C. Activities :**

What do the CMC, CPG and FD personnel usually **DO** during their work?

Possible activities	CMC members	FD personnel
Aware community of 'dos' / 'don't		
Prevent hunting wildlife		
Prevent illegal logging		
Prevent encroachment		
Prevent grazing domestic animals in forest		
Others? What?		

What is the role of CMC/CPG Leader?

1. ....
2. ....

Notes on CMC's/CPG's functionality:

1. ....
2. ....

**D. CMC/CPG EFFECTIVENESS :**

- Participatory Monitoring of forest offence
- Fire Management



- Laws and regulations related to PAs
- Wildlife and/or wildlife related surveys
- Others (what?)

What actions should be taken to improve forest, (fishery where applicable) and wildlife conservation?

- 1.
- 2.
- 3.

What more could your CMC/CPG do for conservation?

- 1.
- 2.
- 3.

What are the challenges does your CMC/CPG face (while conserving the forest and other issues)?

1. ....
2. ....
3. ....
4. ....
5. ....

What are the measures needed (take) to continue the programme?

- 1.
- 2.
- 3.
- 4.
- 5.

Institutional (legal and management) supports required:

- 1.
- 2.
- 3.

**Part B.**

1. How FD is working for co-management of forest resources conservation?

- 1.....
- 2.....
- 3.....

2. What are the challenges of co-management for ensuring sustainability of forest?

- 1.....
- 2.....
- 3.....
- 4.....

3. How to overcome the problems of co-management?

- 1.....
- 2.....
- 3.....
- 4.....

4. Is it possible to manage the forest sustainably through co-management?

- 1. Yes 2. No

5. If possible then how?

- .....
- .....
- .....

6. Can co-management reduce the degradation of forest due to agriculture and logging activities?

- 1. Yes 2. No

7. Does FD provide any alternative job opportunities for the local people?

1. Yes 2. No

8. What are the efforts of FD for conserving the wild resources and other resources?

- 1.....  
2.....  
3.....

9. What is your suggestion for managing the forest properly?

- .....  
.....  
.....

10. Do you think that forest rules and regulations are adequate?

1. Yes. 3. No

11. Is there any discrimination between rich and poor for applying these rules?

1. Yes. 2. No

12. Rank their performance CMC/CPG (10 score)

1	2	3	4	5	6	7	8	9	10
Lowest					highest				

Comments/explanation:

1.  
2.  
3.

13. Rank the impacts of CMC/CPG actions

1	2	3	4	5	6	7	8	9	10
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Lowest highest

Comments/explanation:

- 1.
- 2.
- 3.