

Ecotourism in Sri Lanka's mangroves

A research on how ecotourism contributes to Community Based Mangrove Management (CBMM)



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Preface

The past year, I worked on this Master Thesis about ecotourism and mangrove management in Sri Lanka. After completing my bachelor Geography, Spatial Planning and Environment and the courses of my master Cities, Water Climate Change I wanted to investigate something new, something adventurous that crossed the borders of the Netherlands. Therefore, I went searching for opportunities to do volunteer work in mangrove areas across the world. Mangrove forests have always interested me, since they serve as natural buffer zones and are very important for carbon storage and biodiversity. Unfortunately, it is a fact that these beautiful ecosystems are often misused and destroyed. After some investigation, Sri Lanka appeared to be a very interesting country to do research on mangrove management. The country struggles in their mangrove management and had just suffered from a Tsunami, an economic crisis and knows an unstable political situation. As I started to prepare for my travel, I noticed Sri Lankan people were very well-willing to help me and warmly wanted to welcome me in their country. This gave me trust in the process. When I left from the airport in September 2023, I knew this research would bring me to inspiring people, hidden places and beautiful mangrove areas of Sri Lanka. And it did. I dedicate this research to all people in Sri Lanka who try to protect these beautiful mangrove areas and improve livelihood situations with all their strength. Although there are so many challenges and setbacks in conserving mangroves, it was so inspiring to meet people who did not give up on their mission to protect these ecosystems. I want to thank all the interview participants for sharing their thoughts, inspiring me with their strength and learning me about Sri Lanka as a country. I look back on an amazing trip and I am forever thankful that I got the opportunity to talk to you all and have a real Sri Lanka experience.

After 2,5 months of traveling I had time to analyze all the data and write the document that now lies before your eyes. I want to thank my supervisor Sander Meijerink for helping me in this process and giving me monthly feedback. Finally, I also want to thank my partner, family and friends for giving me support and the advice to take it 'step by step'. Coincidentally, this is the same advice initiative leaders gave when we talked about mangrove conservation: *"You should take it step by step, and celebrate every small victory"*.

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Abstract

The mangrove ecosystems in Sri Lanka serve as buffer zones, reducing the damage storms and waves may have to the coastal livelihoods. Unfortunately, mangroves can be considered as a misused ecosystem in Sri Lanka. One way to overcome this, is the implementation of Community Based Mangrove Management (CBMM). CBMM refers to decentralization of rights, by shifting responsibilities and authority on mangroves from government to local communities. CBMM is often associated with programs that involve some kind of revenue generation through the mangroves in order to gain income for local people. One of these programs is ecotourism. Ecotourism is in absence of general recognition of the practical conditions under which it should be best managed to contribute to CBMM. The aim of this research is therefore to describe to what extent and how ecotourism contributes to CBMM. This is done through a case study in Sri Lanka.

The results showed that ecotourism can positively, but moreover negatively contribute to the successfulness of CBMM. Ecotourism leads to a value increase of the mangrove forests, high participation grades and an increase of livelihood welfare. On the other hand, ecotourism also has high chances to negatively contribute to CBMM. Ecotourism often causes pollution and asks for even more technical training due to a lack of entrepreneurship skills. Besides that, it can be concluded that ecotourism does not have a positive influence on all political issues regarding CBMM. When looking at the social context, there are high chances economic benefits are not fairly distributed among the community if it is not carefully monitored.

Therefore, ecotourism is in need of a proper working monitoring system, broad educational programs and a community association that controls the licenses and fairly distributes the incomes. Given the fact that government bodies, in the case of Sri Lanka, already struggle due to a lack of staff members, funding and technical knowledge, it can be doubted whether ecotourism should be recommended as strategy to successfully contribute to CBMM.

Keywords: Ecotourism, Community Based Mangrove Management, Sri Lanka, Mangroves, Involvement Local Communities, Tourism.

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1.0 Introduction

In 2015, Sri Lanka became the first nation to legally protect all its mangrove forests. Sri Lanka acts hereby as an important exemplar in mangrove management for other nations (Veettil et al., 2023). The mangrove ecosystems in Sri Lanka serve as buffer zones, reducing the damage storms and waves may have to the coastal livelihoods (Mangroves – IUCN, z.d.). Besides that, mangroves are known for a lot of other benefits like their carbon storage potential, filtration actions and their biodiversity conservation, since they are home for more than 3000 fish species, insects and birds. However, in Sri Lanka, mangroves are facing big threats due to urbanization, pollution, exploitation of timber and intensive aquaculture and shrimp farming. In fact, mangroves can be considered as the most misused ecosystems in Sri Lanka (Veettil et al., 2023).

Analysis of the human-environment interactions remains spread among a wide range of scientific fields, each with their own set of theories. In the literature on common pool resources, community based mangrove management is considered as the most effective approach to prevent mangrove degradation and achieve sustainable results in mangrove conservation and restoration (Datta et al. 2012). This approach is known for its focus on local participation and the shift of responsibilities from higher authorities to local communities. Unfortunately, there is no assurance that every community-based mangrove management undertaking is sustainable (Garcia & Lescuyer, 2008). According to Arfan & Taufieq (2017), socio-economic conditions of the local community should be taken into account when developing a CBMM. Within common pool resource management, a market approach on managing natural resources is, therefore, widely debated. There is a need for a market-based measure to provide economic incentives to protect the common pool resources, especially for the local communities (Huang, 2017). It is hoped that through the market mechanism, conservation of natural resources and local community development can be integrated harmoniously. For this, ecotourism is often raised as one of the most popular and promising strategies in the last several decades.

Ecotourism is also upcoming in Sri Lanka. Wickramasinghe (2013) describes Sri Lanka as “blessed with splendid and diverse forests, wildlife resources as well as a rich cultural heritage” and “with a significant potential to be developed as an ecotourism destination” (p.17). Ecotourism is, within the environmental economics literature, often considered to be a potential strategy to support conservation of natural ecosystems while, at the same time, promoting sustainable local development (Ross & Wall, 1999). It is a form of sustainable tourism that enables tourists to travel to natural areas while taking into account the needs of local communities and the benefits to local stakeholders of conserving cultural and natural areas (Swangjang & Kornpiphat, 2021). However, ecotourism also knows its risks and can be just as unsustainable as other more intrusive forms of tourism if it is not driven by the right ethical imperative (Fennell, 2014).

In the literature, relatively few scholars within human-environment studies have examined the linkage between common pool resources and ecotourism. This creates a lack of knowledge on how ecotourism should be best managed to contribute to CBMM (Ross & Wall, 1999).

To offer a solution to this problem, a closer look will be taken to the conditions that create successful community based mangrove management in Sri Lanka and how ecotourism might play a role in this. Eventually, an answer will be given on the question to what extent and how ecotourism contributes to community based mangrove management (CBMM).

1.1 Research objective and research questions

1.1.1 Research problem

Analysis of the human-environment interactions remains spread among a wide range of scientific fields, each with their own set of theories. The widespread distribution among different scientific fields brings along challenges, because empirical work cannot be as efficient or effective without thorough understanding of all theories that can be applied. Relatively few scholars within human-environment studies have examined the linkage between common pool resources and ecotourism. Analyses of the effects of ecotourism development on commons management are relatively scarce. This creates a lack of knowledge on how ecotourism should be best managed to contribute to CBMM (Ross & Wall, 1999).

Problem statement:

There is a lack of knowledge on how ecotourism contributes to CBMM.

1.1.2. Research aim

The purpose of this case study is to describe how ecotourism might contribute to community based mangrove management.

1.1.3. Research questions

The main question of this research is:

To what extent and how does ecotourism contribute to Community Based Mangrove Management (CBMM)?

This question is subdivided into 3 sub questions:

1. What are the conditions for successful CBMM?
2. To what extent and how does ecotourism contribute to the realization of these conditions?
3. Which recommendations for the design of ecotourism result from this?

1.2 Relevance

1.2.1 Societal relevance

This research is societally relevant, because it explores the role of ecotourism in community based mangrove management that can help the Sri Lanka communities conserve their mangrove forests in an efficient, sustainable way. Mangroves are of high importance for ecosystems and have a wide range of benefits to both animals and humans in Sri Lanka. First of all, mangroves serve as coastal protection barriers, reducing the damage of storms to the coastal communities behind mangroves (Mangroves – IUCN, z.d.) . Especially for Sri Lanka it is of high value to conserve the mangroves, because the country is surrounded by sea and the number of floods and other natural hazards has increased in the past year due to climate change (World Bank, 2022) . Furthermore, mangroves act as water filtration, have a very high carbon storage potential and are home to thousands of different species, including globally threatened species in Sri Lanka (Mangroves – IUCN, z.d.).

Another important benefit from mangroves is that they are very valuable for local livelihoods, since they provide food, fish, timber and a place for tourists to visit. Especially nowadays, in 2023, Sri Lanka is in high need of valuable forests like these, because years of bad economic management, the Covid pandemic, War in Ukraine, several Terror Attacks and bad policy of the Rajapaksa government caused the Sri Lankan economy to drop dramatically in 2022 (RTL Nieuws, 2022). The news article mentions that spokesmen of the Sri Lankan government say that this crisis is their worst since the independence in 1948. Figure 1 shows the increased poverty rate since 2022 (percentage) according to the World Bank (2023).

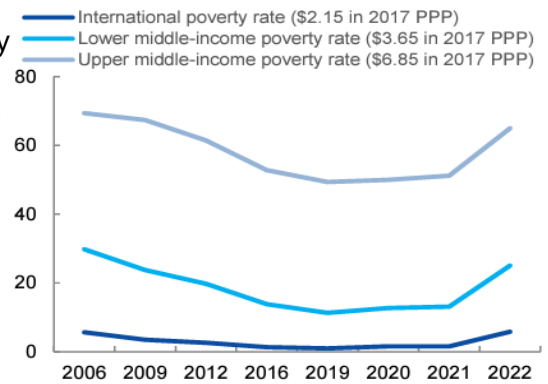


Figure 1: Poverty rate Sri Lanka (percentage) (The World Bank, 2023)

Even though mangroves have a lot of benefits for the country, approximately 25% of mangrove habitats in Sri Lanka are estimated to have been destroyed between the years 1980 and 2005, (Mangroves – IUCN, z.d.). Major reasons for this were expansion of aquaculture, agriculture and urban uses for which the mangroves had to be destroyed (Mangroves – IUCN, z.d.). Pollution from waste water and aqua ponds and deforestation for timber are also mentioned as threats for the forests (Veettil et al., 2023). Veettil et al. (2023) even state that mangroves can be considered as one of the most misused ecosystems in Sri Lanka.

The problem has been acknowledged by the government, several organizations, citizens and NGO's, but mangrove management strategies appear to be rare and ineffective. The lack of initiatives causes degradation of the mangrove forests even further (Nijamdeen et al., 2023).

A number of actors who have conducted community-based mangrove conservation or restoration activities in Sri Lanka failed unfortunately in majority (Veetti et al., 2023). In their social network analysis, Nijamdeen et al., (2023) concluded that overall, a lack of financial assistance (due to the economic crisis), poor collaboration and communication, a lack of awareness, intrusion, and issues related to land ownership were the biggest challenges hindering mangrove management in Sri Lanka. Veetti et al. (2023) add to this that inappropriate species selection, lack of monitoring and knowledge on hydrology and environment also caused initiatives to fail. Moreover, the lack of continuous economic benefits to the neighboring communities has also challenged the long-term sustainability of mangrove rehabilitation efforts in many areas (Ratnayake, 2012). Considering current trends in tourism, ecotourism activities might be an opportunity to create an additional or alternative income (f.e. boat tours, ecolodges) for mangrove community stakeholders. Ecotourism strategies in Sri Lanka are especially important in this period of time, as Pathmasiri (2017) mentions the government of Sri Lanka has not placed sufficient attention to monitor ecotourism practices of the country until the 21st century. Therefore, this era can be seen as the 'ecotourism policy era' in the country, where he recommends implementing a national policy on ecotourism and microscale ecotourism policies simultaneously. In this research, a closer look will be taken, to what extent and how ecotourism might contribute to community based mangrove management. If that is the case, ecotourism might be recommended as a strategy in its 'ecotourism policy era' to conserve mangrove forests in Sri Lanka.

1.2.2 Scientific relevance

Nowadays, one of the key challenges in scientific research is understanding how human-environment interactions can generate more sustainable outcomes (Cox et al., 2016). Cox et al., (2016) mention that analysis of the human-environment interactions remains spread among a wide range of scientific fields, each with their own set of theories. These fields include f.e. common-pool resources, environmental economics, political ecology and sustainability science. The widespread distribution among different scientific fields brings along challenges, because empirical work cannot be as efficient or effective without thorough understanding of all theories that can be applied (Cox et al., 2016). As a result, Cox et al., (2016) state that researchers may continue to collect facts and document patterns inductively, without testing theories generated by their colleagues, and the science of sustainability may therefore remain in an exploratory phase.

To overcome the challenge of spread distribution on human-environment interaction knowledge, this research brings the two scientific fields 'common-pool resources' and 'environmental economics' together in one case study. Although ecotourism and common pool resource management have each been intensively researched over the past twenty years, relatively few scholars have examined the linkage between the two (Stronza, 2009). Therefore, analyses of the effects of ecotourism development on commons management are relatively scarce. This research combines these two theoretical fields. On the one hand, there are mangrove forests that serve as common-pool resources. In the common pool literature, a community-based approach is recommended by Ostrom (2008) to prevent a 'tragedy of the commons'. Such an approach is in this research defined as Community Based Mangrove Management (CBMM). Within CBMM, scientific knowledge gaps are also known that increase the scientific relevance of this research. Datta et al. (2012) noticed there are hardly any studies on CBMM that focus on the impacts of globalization that might cause socio-cultural transformations. Since increasing tourism can be seen as an impact of globalization and this study describes the way in which tourism can contribute to CBMM, this research will contribute to this knowledge gap. Satyanarayana et al., (2013) also highlight the importance of a social perspective on conservation of mangroves, because research nowadays is in majority focused on the ecological and economic importance of mangrove ecosystems. This social perspective is urgent, since there is an increasing demand for socio-economic development in coastal resources in the light of climate changes and sea-level rise (Phong et al., 2023). Additionally, Phong et al. (2023) mention still limited knowledge is obtained on how local communities perceive the outcomes of their involvement in protecting mangrove forests under co-management programs. This knowledge is important to reveal the entire picture of community based mangrove management and thereby avoiding mistakes in implementation of the projects.

On the other hand, there is ecotourism. In environmental economics and the tourism literature, ecotourism is often considered to be an efficient management approach to conserve natural ecosystems and at the same time promote sustainable local development. Ross & Wall (1999) mention that ecotourism is in absence of the conditions under which it should be best managed. This research is therefore, scientifically relevant, since it contributes to this knowledge gap.

Lastly, this research contributes to the existing knowledge on CBMM and ecotourism, because Sri Lanka is hardly used for a case study on these theories before. Moreover, little research has been conducted on the subject of ecotourism as a possible tool in sustainable forest management (Wickramasinghe, 2013). Sri Lanka knows a turbulent history of civil war, climate hazards and terror attacks. This made the country not attractive for researchers or ecotourists to travel to, because fieldwork and surveys in conflict settings were challenging during that time (Nijamdeen et al., 2023). Furthermore, the Tsunami in 2004 partly destroyed the Sri Lankan mangrove forests. This makes Sri Lanka a unique location, because the Tsunami was followed by rapid mangrove restoration initiatives in all coastal provinces, most of which ended up in failure (Nijamdeen et al., 2023).

All in all, it can be concluded that his research is scientifically relevant, because it uniquely combines two theoretical fields and provides extra knowledge on CBMM and ecotourism as theoretical concepts. Since all this important data is collected in a country where fieldwork has not been done for a long time, it might provide new insights and contextual circumstances.

1.3 Reading guide

To answer the question how ecotourism contributes to CBMM, first a literature review is given on the concepts 'Common Pool Resources', 'CBMM' and 'Ecotourism'. From this, a conceptual model is formed which is shown in chapter 2.4. In chapter 3, the methodology of this research is described and argued. It contains the philosophical assumption and a detailed description of the case study selection and research methods that are used. After that, the results are presented in chapter 4. In this chapter, the sub questions are answered one by one. First, a contextual description of mangrove management is given. Then, the conditions that create successful CBMM are examined. Afterwards the contribution of ecotourism on these conditions is discussed and an answer is given to the main question of this research: *To what extent and how does ecotourism contribute to Community Based Mangrove Management (CBMM)?* This research ends with a conclusion, recommendations and reflection.

2.0 Literature review and theoretical framework

In this research, theories and literature from the field of common-pool resources and community based mangrove management will be intertwined with the field of environmental economics and ecotourism theories. First, the thoughts on managing common-pool resources are discussed. Then, literature on CBMM and its conditions is described. After that, a switch is made to the environmental economic field and the definition, benefits and challenges of ecotourism as a concept are discussed. After that, the research fields come together and an overview of the literature that already exists on ecotourism within mangrove management is given. This chapter concludes with the construction of a conceptual model, based on all the literature discussed.

2.1 An integrated approach on natural resource management

During the 90' the view on natural resources and the environment management has shifted from the focus on production of commodities towards preservation of the entire ecosystem (Wallace, 1996). This increasing ecosystem management philosophy depends as much on understanding social and political factors as it does on understanding biological information (Wallace, 1996). Therefore, environmental debates nowadays no longer center only on the importance of nature conservation, but also on the question what kind of natural areas need to be protected, how, and by whom (Buijs, 2012). To answer these questions, integration of knowledge from different disciplines like political ecology, environmental economics and common property resource management has been recognized as a key factor (Cox et al., 2016). Natural Resource Management (NRM) should therefore be seen as an integrated approach that takes into account different factors leading to social, economic and environmental sustainability. Within NRM, several strategies and approaches are known to understand the complex relationship between humans and the environment. In this research, common pool resource management and ecotourism theories are discussed.

2.2 Managing common pool resources

Common-pool resources are resources that are “sufficiently large that it is difficult, but not impossible, to define recognized users and exclude other users altogether. Furthermore, each person’s use of such resources subtracts benefits that others might enjoy.” (Ostrom, 2008, p. 11). Walker et al. (2022) explain that mangrove forests are often treated as common-pool resources within national legal frameworks and research. Mangroves are located in an intertidal zone, which is already since the Romans governed as a common to all mankind being so close to the sea (Walker et al.,2022). Also, mangrove forests are not owned by any individual person, but owned communally by all the people living within its sovereignty (Walker et al.,2022). Therefore, in this research, mangrove forests are categorized as a common-pool resource.

2.1.1 Tragedy of the commons

In 1968, Garrett Hardin published an influential paper about a problem that described the “tragedy of the commons,” in which humans overuse and deplete a common-pool resource even though it is not in their best interest to do so. Hardin explains that this tragedy occurs, because individual users act in their own self-interest and therefore exploit shared resources, leading to the loss of the resource for all parties. Given this understanding, the only way to ensure that a common resource is maintained is through either transforming commons to private property or restriction of use from an outside authority (Walker et al., 2022). Until the 1980s, many scholars had presumed that the users of common-pool resources could not self-organize to manage them (Cox et al., 2010). However, Nobel prize-winning political scientist Elinor Ostrom proved differently and suggested, by identifying numbers of case studies in which self-management of a commons resource has been successful, that Hardin’s tragedy of the commons cannot be a universal truth (Ostrom et al., 1999). According to her, common-pool resources can be managed by the local communities themselves.

2.1.2 Principles for managing common-pool resources

Using lessons from her case studies, Elinor Ostrom outlines eight design principles for governing common-pool resources that increase the likelihood of successful community-based natural resource management. These design principles are probably the most famous arguments in the field of commons management. In 2010, Cox et al. (2010) conducted a meta-analysis of the literature that had evaluated Ostrom's theories and introduced a slightly modified version of the principles. Cox et al. (2010) formulated the principles invented by Elinor Ostrom as follows:

Principle	Description
1a	User boundaries: Clear boundaries between legitimate users and nonusers must be clearly defined.
1b	Resource boundaries: Clear boundaries are present that define a resource system and separate it from the larger biophysical environment.
2a	Congruence with local conditions: Appropriation and provision rules are congruent with local social and environmental conditions.
2b	Appropriation and provision: The benefits obtained by users from a common-pool resource, as determined by appropriation rules, are proportional to the amount of inputs required in the form of labor, material, or money, as determined by provision rules.
3	Collective-choice arrangements: Most individuals affected by the operational rules can participate in modifying the operational rules.
4a	Monitoring users: Monitors who are accountable to the users monitor the appropriation and provision levels of the users.
4b	Monitoring the resource: Monitors who are accountable to the users monitor the condition of the resource.
5	Graduated sanctions: Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and the context of the offense) by other appropriators, by officials accountable to the appropriators, or by both.
6	Conflict-resolution mechanisms: Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.
7	Minimal recognition of rights to organize: The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.
8	Nested enterprises: Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.

Table 1: Principles for successfully community-based common-pool resources management (Cox et al., 2010) based on (Ostrom, 2008).

Certainly, there are some critiques on the thoughts of Elinor Ostrom. Cox et al. (2010) identify in their meta-analysis that incompleteness of the principles is the most important empirical critique found in the literature. Some other factors like type of government regime and which users operate are also clearly important in many cases Cox et al., (2010). Another critique from Block & Janković (2016) is that she did not properly use all types of private property rights, since she missed out partnership arrangements, which is neither under government control nor that of free market participants. They advocate that the true lesson of her findings should be that private property regimes do exist outside of the confines of government control. However, empirically, Cox et al. (2010) think the principles are well supported and

important critiques were rather abstract than empirical. This makes the principles of Ostrom therefore useful as a baseline for analyzing the successfulness of Community Based Natural Resource Management (CBNRM). In this research, her principles form the fundamental of all the conditions that cause successful CBNRM. Since the most empirical critique on Ostrom is the incompleteness of the conditions, in the next paragraph, a literature overview is given on what can be identified as more conditions that cause successful CBMM.

2.2 Community Based Mangrove Management (CBMM)

According to Ostrom, common-pool resources can be managed by the local communities themselves (2008). Other past research also indicates the participation of local communities as a major success factor or failure within natural resource conservation (Roy, 2016). Although larger policy decisions may influence conservation of mangroves, their sustainable use largely depends on the exploitation and attitude of the local communities. Therefore, the importance of Community Based Natural Resource management is further examined in this research.

2.2.1 Definition and successes

According to Datta et al. (2012), The essence of CBMM lies in the concept that (local) people have to be recognized first and by doing that, sustainable mangrove forest management will follow. CBMM is intertwined with the broader concept of community based natural resource management (CBNRM), which refers to decentralization of rights, by shifting responsibilities and authority on natural resources from government to local communities (Alcorn et al., 2002). This requires a degree of trust between all actors that can be developed through participatory approaches that are truly accessible, interactive and responsive (Krumpe & McCoy, 1995). According to Aspen et al. (2011), the term CBNRM describes the management of resources such as forests, wildlife and water by collective, local institutions for local benefit.

Community Based Mangrove Management (CBMM) has been recognized by both governing agencies and academia for sustainably managing the ecologically important mangrove forests which are disappearing rapidly worldwide (Datta et al., 2012). Damastuti et al., (2023) also mention that CBMM is considered the most effective approach to achieve sustainable results in mangrove management. So in practice, the community is not only the one who benefits from CBMM, but also the main actor in every step of the mangrove management process (On-prom, 2014). This is a major success factor of CBMM, because the information collected will be highly relevant and reflects the realities and opinions of community members, especially the vulnerable and poor (On-prom, 2014). This builds local capacity and development activities will be more effective, because people have better knowledge and expertise in local resource management than government/private agencies (Wibisono et al., 2023).

2.2.2 Challenges and conditions

However, CBMM also knows challenges and is not in every case a guarantee for success. In this paragraph, conditions for successful Community Based Mangrove Management will be discussed. In chapter 2.1.2. The principles of Elinor Ostrom regarding successful CBMM have already been outlined. In this chapter, these conditions are extended with views from other researchers. The conditions are categorized into technical, political, social and economic conditions. After determining which conditions cause successful CBMM, an analysis will be done on how ecotourism can contribute to these conditions.

Technical conditions

The first technical principle a community based mangrove project has to comply with is Ostrom's clear definition of boundaries of the users and resource system (2008). Furthermore, in order to ensure CBMM can be economically sustainable in the long term, habitat and diversity factors of mangroves should be taken into account and ecological dynamics maintained (Datta et al., 2012). Datta et al., (2012) describe that ecological contributions of community managed mangroves are questionable as biodiversity issues are not always taken into consideration. The research of Phong et al. (2023) also shows that community members involved in a community based mangrove program encountered a shortage of technical skills and resources that challenged effective coastal protection. Likewise, they

could not determine the causes of coastal erosion and were incapable of helping volunteers. Therefore, a condition Wickramasinghe (2017) also mentions for successful CBMM is capacity and know-how on conserving specific areas of mangrove forests. This could even get more successful, if the knowledge on mangrove rehabilitation is from locals and integrated in the community.

Another technical condition that should be met is effective monitoring to avoid some individuals to cheat to the detriment of others and the mangrove environment (Suharti et al., 2022). Elinor Ostrom divides the monitoring into two divisions: monitoring on the users and on the resource. Wickramasinghe (2017) also mentions the importance of monitoring. One of the challenges, described by Buncag (2021), is the potential lack of capacity from the local community for planning, management and evaluation. In order to monitor the mangrove management system and have periodic evaluations, the community should be supported by local government, academia and others in using the right applicable criteria and indicators (Buncag, 2021). This could be done, for example, by providing workshops, training and technical/financial support.

Political conditions

A political major challenge faced within CBNRM is lack of efficient management caused by communication barriers and the absence of strategic collaboration. About this, Damastuti et al., (2023) mention the critical role of capable leaders who stimulate collective action and active involvement of all stakeholders. Leaders that take initiative, monitor the project and take responsibility of the aims of the project are a key to success in CBMM (Damastuti et al., 2023). If there is an absence of strategic collaboration and lack of capable leaders from the involved community, there are high chances the assigned government agency still is intensively involved in protecting the mangroves (Phong et al., 2023). The study of Phong et al. (2023) shows that this was the case in a community based mangrove management project in Kien Giang, Vietnam. Here, the government agency also faced to main difficulties in mangrove protection: insufficient capacity and limited staffing and resources. These two limitations hindered the monitoring of coastal erosion. Elinor Ostrom also highlights the importance of the rights of appropriators to devise their own institutions. They should not be challenged by an external governmental authority. Wickramasinghe (2017) shows, however, in his case studies that the involvement of the central government is sometimes a crucial factor to guarantee long term sustainability of the project. Ostrom highlights that this can only be successful if the appropriation, provision, monitoring, enforcement and governance activities are organized in multiple layers of nested enterprises. Good governance on CBNRM by the local government also requires a revised, implemented management plan (Tveit et al., 2007). This plan ensures conservation initiatives that can be integrated. Also, there should be a mechanism for conflict resolution and strict sanctions for each violation to encourage users to comply with the mutually agreed rules (Suharti et al., 2022). This is in line with Ostrom's principles on graduated sanctions and conflict-resolution mechanisms (2008)

Social conditions

A social condition Ostrom (2008) mentions is the congruence of management with local conditions. Appropriation and provision of rules should be congruent with local social and environmental conditions. Next to that, Wickramasinghe (2017) learned from two case studies in Sri Lanka, that continued community participation and benefit sharing such as livelihood support for the community play a significant role towards success in community participation in mangrove conservation projects. A challenge many conservation projects face is a lack of support from the neighborhood. Therefore, Suharti et al. (2022) highlight the importance of active involvement of all stakeholders including people living around the wetland and traditional users such as farmers, the fishery community and entrepreneurs. Bond et al. (2006) also mention in their manual on CBNRM that the community or group that lives within the resource should also be the same as the group that makes the decisions over the resource and the same as the group that benefits. Ostrom (2008) also highlights the importance of this in her principles. It is necessary to use carefully designed public awareness and bottom-up planning processes for an optimal result (Damastuti et al., 2022).

Economic conditions

Another obstacle CBMM has to overcome is the lack of funding and income generation. Wickramasinghe (2017) mentions that logistical and financial support provided by an external organization has resulted in positive outcomes on several case studies on CBNRM projects. CBMM cannot be sustainable when a method is used that is solely oriented towards conservation of biodiversity, but neither when it is solely focused on increasing productivity for financial benefits (Ginantra, 2022). A project that covers the quality of life of low-income families by providing environmentally friendly skills, investments and work opportunities is according to Suharti et al. (2022) a requirement that guarantees successful CBNRM. Moreover, it is also argued that communities living with the natural resource should receive higher benefits than those who do not. It is of high relevance that the distribution of benefits is in accordance with the costing a stakeholder has made (Suharti et al., 2022). In condition 8, Ostrom also highlights that the benefits obtained by users from a common-pool resource, as determined by appropriation rules, are proportional to the amount of inputs required in the form of labor, material, or money, as determined by provision rules.

2.2.3 Conclusion CBMM

Overall, CBMM can function as a very successful strategy to sustainably govern the mangroves in which the local community is the main factor in every step of the process. However, in order to successfully manage the mangroves in such a way that the lagoon is not polluted and community members are happily the main actor in every step of the decision-making process, a large set of technical, political, social and economic conditions have to be met. In the next paragraph, the literature on ecotourism and how it might contribute to these conditions will be discussed.

2.3 The role of ecotourism

In this paragraph, the role of ecotourism within CBMM is explored and a description will be given on how ecotourism might contribute to CBMM. Although ecotourism and common pool resource management have each been intensively researched over the past twenty years, relatively few scholars have examined the linkage between the two (Stronza, 2009). Therefore, analyses of the effects of ecotourism development on commons management are relatively scarce. Huang (2017) mentions that a market approach on managing natural resources is the most debated in the literature and asks for a market-based measure to provide economic incentive to protect the common pool resources, especially for the local communities (Huang, 2017). Huang (2017) mentions it is hoped that through the market mechanism conservation of natural resources and local community development can be integrated harmoniously. For this, ecotourism is often raised as one of the most popular and promising strategies in the last several decades. Ecotourism is namely one of the tools used for mangrove management that can effectively overcome environmental problems in the forest, by creating an economic alternative for the community, offering environmental education and involving local participants (Kurniawati, 2022).

2.3.1 Definition

Ecotourism can be seen as a “travel by tourists with a primary interest in the natural history of a destination” (Fennell, 2014, p. 38). An ecotourism initiative is 1) Nature-based 2) Sustainable through local participation and conservation of nature 3) Educative and 4) Carried out by moral imperative (Fennell, 2014). Ecotourism involves and empowers local people and provides considerable benefits for the environment, visitors and agencies (Cabahug, 2002). Ross & Wall (1999) also use this definition. They say ecotourism is viewed as a way to protect natural areas, while at the same time it generates revenues, environmental education and the involvement of local people. To prevent discrepancies in the definition, ecotourism requires embodiment of intrinsic rather than extrinsic values (Nelson, 1994). Nelson (1994) also highlights that ecotourism is often confused with adventure, thrill-seeking tourism (f.e. rafting), but it needs to be understood that ecotourism is focused on admiration of nature and education, not on physical achievement.

Furthermore, Ross & Wall (1999) mentioned that sustainable ecotourism is based on the assumption that it develops synergistic relationships between tourism, biodiversity and local communities, facilitated by appropriate management strategies. Figure 2 shows a schematic overview of these relationships.

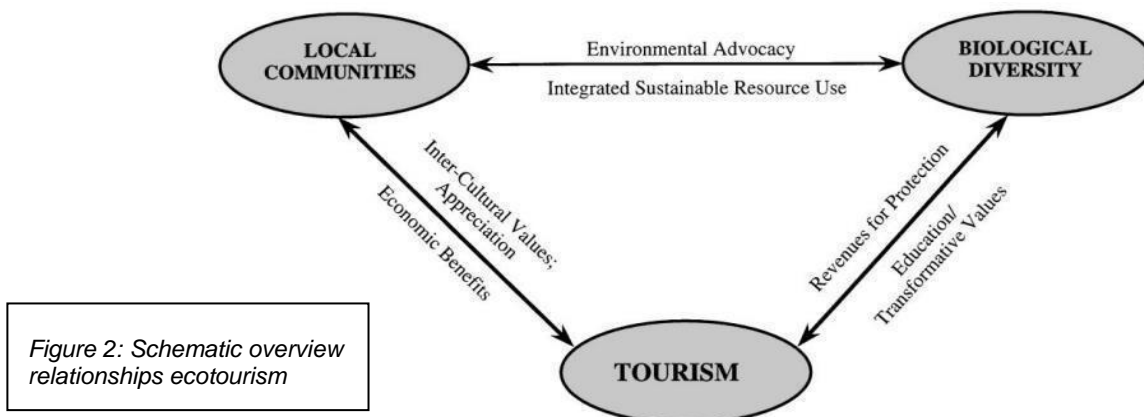


Figure 2: Schematic overview relationships ecotourism

In the relationship between local communities and biodiversity, local residents act as stewards and in return they benefit from the natural resources. Also, by participating in ecotourism, local communities can generate economic, social and infrastructural benefits. These benefits are less likely to leak out of the community if participation is local (Cater, 1994). In return, tourists have a chance to speak to local residents and share inter-cultural values. Lastly, tourists bring in money that can be used to protect the biological diversity of the natural areas. In return, tourists get a unique insight into the natural areas and create awareness on its importance for the ecological system.

Wood (2002) states 8 principles that make ecotourism genuine and sustainable:

- 1) Conservation of biological and cultural diversity through ecosystems and protection
- 2) Sustain the well-being of local people
- 3) Includes a learning experience: environmental & cultural knowledge
- 4) Involves responsible action on the part of tourists
- 5) Is served primarily by small – scale businesses
- 6) Minimizes to lowest possible level the consumption of non-renewable resources
- 7) Stresses local participation, ownership and business opportunities, particularly to rural people.

2.3.2 Ecotourism and common pool resource management

Looking at the aspects of ecotourism and knowing the attributes of CBMM, ecotourism might be a strategy that contributes to CBMM in several ways.

Already many scholars have analyzed how tourism development creates new social relations that reconfigure local residents' sense of place, community and identity (Stronza, 2009). These changes have powerful effects on local valuations of natural and cultural resources. Ecotourism has the unique potential for generation of economic growth and biodiversity conservation at the same time (Ginantra, 2022). This is essential, since CBMM cannot be sustainable when a method is used that is solely oriented towards conservation of biodiversity (Ginantra, 2022). Stronza (2009) also mentions that ecotourism helps building capacity, since help is needed from residents to exert control over the resources, and cultural traditions. Especially, because these are formed into attractions for outside tourists. Also, ecotourism stimulates collaborations between communities and private companies and these are extremely common in ecotourism projects (Stronza, 2009). In these collaborations, local community members share their knowledge, labor, land and skills with, for example, private tour operators who have the market know-how, managerial experience and investment capital. These collaborations have the potential to enhance the management and conservation of common-pool resources (Stronza 2009). Furthermore, Ginantra (2022) mentions that mangrove forests might function as a research laboratory for students or researchers and provide interpretive experience with good knowledge for visitors about the existing flora and fauna. This might increase the knowledge on ecology and biodiversity issues. However, this potential benefit of ecotourism only works if mangrove forests are running in balance and flora and fauna and ecological systems are protected and conserved by the community (Ginantra, 2022). Using mangrove forests for ecotourism activities can be beneficial in several more ways according to Ginantra (2022): 1) it builds environmental awareness 2) it minimizes physical and social impacts 3) it provides a positive experience for hosts and visitors 4) it generates financial benefits for local communities 5) it provides experiences for visitors that increases sensitivity on the political, environmental and social circumstances of the tourist destination 6) it builds infrastructure while minimizing environmental impact 7) it recognizes and empowers the rights and beliefs of the indigenous community.

In their study on ecotourism development perspectives within mangrove conservation, Hakim et al. (2017) developed a conceptual framework for 'mangrove community-based tourism' (Figure 3):

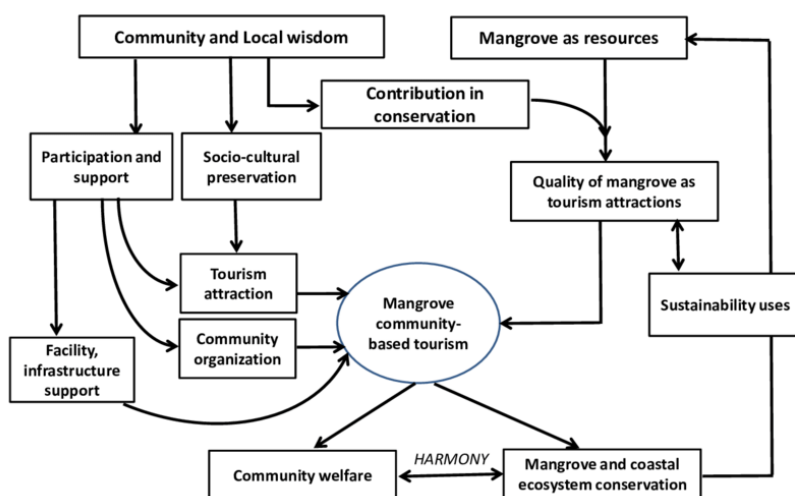


Figure 3: Conceptual framework for local community-based mangrove tourism, with local wisdom as a fundamental aspect of mangrove-based destination sustainability and competitiveness (Hakim et al., 2017)

In this framework, Hakim et al. (2017) state that in order to develop sustainable mangrove-based tourism, community participation and involving their local wisdom is crucial. Local people who have lived in mangrove areas for a long time have an important role in defining active community support and culture preservation within mangrove based tourism, which in turn leads to tourism attraction, facilities, infrastructure support and the establishment of a community-organization. It is also an important factor to increase the uniqueness of the local tradition and culture. In their research they also state that the success of mangrove tourism in their studied area could be due to mangrove site accessibility, local community involvement, the quality of mangrove ecosystems, and availability of mangrove tourism programs.

2.3.3 Challenges and conditions in ecotourism

Although ecotourism has a lot of benefits, it is not always a strategy that guarantees success. Stronza et al. (2019) mention that scholars in conservation biology and ecology critically begin to look at ecotourism, arguing it is not only not helpful to conservation, but in fact, may be harmful to wildlife. Their perspectives were based on theories related to risks of predation or physiological measures related to stress for the animals. Holden (2005) also mentions that the degree to which an ecotourism company causes a higher environmental awareness remains uncertain. Since, for example, the tourists will be willing to take an airplane flight to these exotic locations and test the depth of their environmental ethics. Overall, it is hard to measure the success of tourism as a strategy to conserve nature. Are activities that are helpful to local people in terms of jobs and benefits legitimate, if wildlife still experiences implications?

Nowadays, ecotourism is also often in use as a marketing tactic and a term to give businesses a favorable green edge on the competition (Ross & Wall, 1999). This 'greenwashing' of the term ecotourism is a high risk when implementing ecotourism policy. Therefore, it is highly important to have a clear definition on when an initiative can be called a true, sustainable form of ecotourism and governments should keep monitoring their activities. Furthermore, ecotourism is even within the local communities not always rightly understood. A study of Kurniawati et al., (2022) on ecotourism in East Java, Indonesia showed this by concluding that almost 100% of the people of the village did not understand the concept of ecotourism. They thought that ecotourism was the same as tourism in general. Therefore, ecotourism should be treated carefully when implemented as a tool for nature conservation, because there exist high chances that the term sounds more promising than the reality will reveal. Next to these challenges, according to Coria and Calfucura (2012), the success of ecotourism depends on two complicated conditions:

1) The distribution of benefits and ventures

Due to the involvement of many stakeholders like governments, outside investors and local communities, a very small portion of the tourism benefit might go to the local communities, causing very little incentive to protect the mangroves (Huang, 2017). Wunder (2000) mentions that the effectiveness of tourism income also depends on the incentives used for participation, and on the substitution versus complementarity of other productive activities: only if tourism changes labor and land allocation decisions, it will have a local conservation impact. Coria and Calfucura (2012) also notice this. They mention that ecotourism should not be conceived as the only source of development for local communities, but must be complemented with other actions by the government and other agents. The incentive structure is also an important matter considering the attitudes of the participants (Wunder, 2002). Nature-degrading practices are some of the challenges encountered when incentives are lacking. To conquer this challenge, food sales or the demonstration of handicrafts and cultural elements have high income potential whenever they are ecologically and technically feasible and implemented (Wunder, 2000).

2) community control over land and resource and power relations between the stakeholders. Very often, local communities lack management skills and have a shortage in infrastructure in their neighborhood. The lack of infrastructure is a big problem, because tourists pay themselves for their transportation costs (Huang, 2017). Coria and Calfucura (2012) mention that without the full involvement of local communities and the respect and support from external agents in design, implementation and distribution of ecotourism risks, the project does not survive spontaneously. Social conflicts can emerge from unequal earnings and increased gaps between rich and poor households within the communities that will weaken trust and cohesion among local communities.

Huang (2017) also highlights the importance of a proper policy design. In his research, it is concluded that ecotourism may be causing the extinction of the natural resources without a proper policy design, because the local people might receive too many tourists, exceeding the sustainability level. To avoid this situation, they suggest the following principles:

- 1) control the number of operators through implementing a small number of licenses or by charging high license fees
- 2) raise the access costs through tourist tax or sales tax on the operators
- 3) reduce the amount of accepted visitors

However, despite all the challenges within ecotourism, Coria and Calfucura (2012) mention that it does not mean it should be abandoned. Considering the high threats on biodiversity and the urgency for conservation management, all potential policy options have to be considered.

2.3.4. Conclusion ecotourism

Overall, literature shows that ecotourism is one of the tools that can effectively overcome environmental problems in the forest and in some ways contribute to community-based mangrove management. By creating an economic alternative for the community, offering environmental education and involving local participants it helps overcoming challenges CBMM faces. Next to that, ecotourism builds environmental awareness, it provides a positive experience for hosts and visitors and builds infrastructure and livelihood welfare in the neighborhood. However, these positive contributions only occur when certain conditions are met. To prevent pollution, misunderstanding, greenwashing and an unfair distribution of income, ecotourism should be well monitored, supported by the government and neighborhood and include a proper policy design to prevent a tragedy of the commons.

2.4 Conceptual model

The purpose of this case study is to describe to what extent and how ecotourism might contribute to community based mangrove management (CBMM). To find this out, this research focuses on the conditions under which CBMM should be managed, in order to be a successful management project. After describing these economic, social, technical and political conditions, a further look is taken into ecotourism and to what extent and how this concept might contribute to these described conditions.

First, looking into the concept 'CBMM'. From the literature, it can be concluded that successful CBMM is a way of management in which mangroves are sustainably managed (Datta et al., 2012) and community members are the main actors in every step of the decision-making process (On-prom, 2014). For this, conditions named below have to be met as far as possible:

Economic conditions

- Funding and/or the generation of financial incomes (Wickramasinghe, 2017)
- A project that covers the quality of life of low-income families (Suharti et al.,2022).
- a method that is oriented towards conservation of biodiversity and at the same time focused on increasing productivity for financial benefits (Ginantra, 2022).
- A distribution of benefits that is in accordance with the costing a stakeholder has made (Suharti et al., 2022) (Ostrom, 2008).

Social conditions

- Continued, committed community participation (Wickramasinghe, 2017).
- Support from the neighborhood (Suharti et al.,2022),
- The community or group that lives within the resource is the same as the group that makes the decisions over the resource and the same as the group that benefits (Bond et al., 2006) (Ostrom, 2008)
- Use of the local wisdom (Hakim et al., 2017)

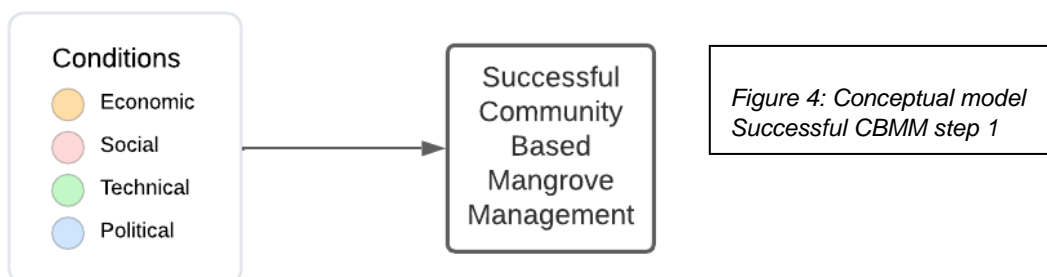
Technical conditions

- Habitat and diversity factors of mangroves are taken into account and ecological dynamics are maintained (Datta et al., 2012).
- Monitoring on the projects (Wickramasinghe, 2017) (Ostrom, 2008)
- Support by local government, academe and others in using the right applicable criteria and indicators (Wickramasinghe, 2017) (Ostrom, 2008).
- Well defined boundaries (Ostrom, 2008)

Political conditions:

- Strategic collaboration (Damastuti et al., 2023)
- Capable leaders (Damastuti et al., 2023)
- Support by all levels of the government Wickramasinghe (2017)
- A revised, implemented management plan (Tveit et al., 2007)
- A mechanism for conflict resolution (Suharti et al., 2022) (Ostrom 2008)

Conceptually this leads to the following model:



The next step is to analyze how ecotourism might contribute to these conditions. Overall, ecotourism is a management strategy which might contribute to CBMM as it protects natural areas, while at the same time it generates revenues, environmental education and the involvement of local people. Using ecotourism as a tool within CBMM management can be beneficial in several ways as seen in the literature review (Ginantra 2022):

- it builds environmental awareness;
- it minimizes physical and social impacts;
- it provides a positive experience for hosts and visitors;
- it generates financial benefits for local communities;
- it provides experiences for visitors that increases sensitivity on the political, environmental and social circumstances of the tourist destination;
- it builds infrastructure while minimizing environmental impact;
- it recognizes and empowers the rights and beliefs of the indigenous community.

These benefits might positively contribute to the social, economic, technical and political conditions that ensure successful CBMM.

However, according to the literature, it is also possible that ecotourism does not contribute to specific conditions at all, or worse, negatively influences them. Ecotourism knows certain challenges. Conceptually they can be described as:

- Green washing (Ross & Wall, 1999).
- Misunderstanding of the concept (Kuniawati et al., 2022)
- Risk of being harmful to wildlife (Stronza et al., 2019)

Furthermore, in order for ecotourism to be truly sustainable, it has to meet the following conditions:

- A proper policy design (Huang, 2017)
- A fair distribution of benefits and ventures (Coria & Calfucura, 2012)
- Community control over land and resources (Coria & Calfucura, 2012)
- Equal power relations between the stakeholders (Coria & Calfucura, 2012)

A summarized conceptual model of this outcome is made below in figure 5. An extended version of this can be found on the next page. The operationalization scheme can be found in appendix 1.

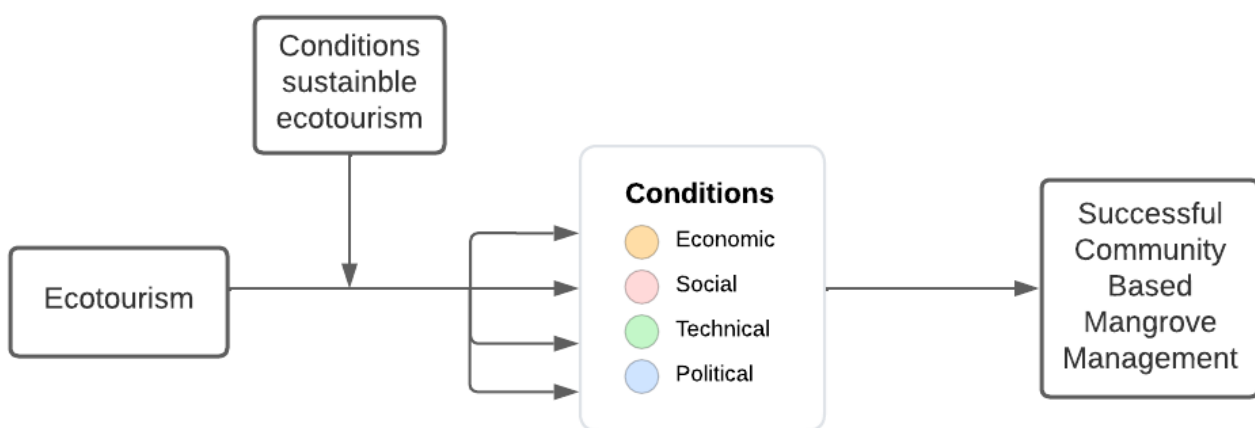
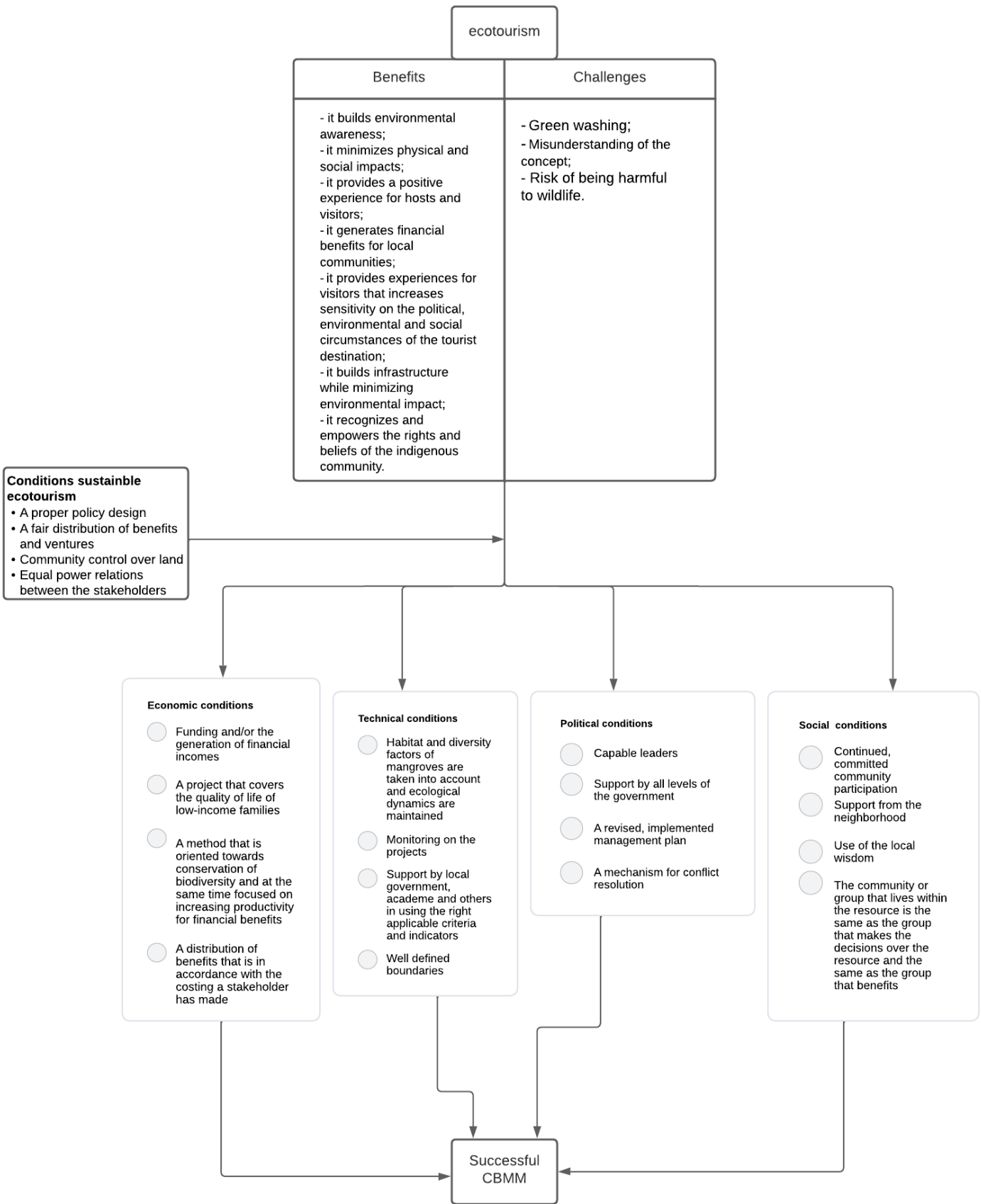


Figure 5: Conceptual model

Figure 6: Conceptual model extended version



3.0 Methodology

In this chapter, all methodological choices are explained and grounded that lay the foundation for this research. First, the philosophical assumption is explained. Then, an overview is given of the research design, data collection and way of data analysis. After that, the case and participant selection is explained including the selection criteria. At last, the validity and reliability of this research are discussed.

3.1 Philosophical assumption

The philosophical assumption that is used in this research is social constructivism. Social constructivism is an approach in which researchers seek understanding of the world through the interaction among individuals (Creswell & Poth, 2007). According to social constructivists, subjective meaning and reality is created when individuals interact with each other and through historical and cultural norms that operate in individual's lives (Creswell & Poth, 2007). Thus, individual values are honored and negotiated between individuals. The goal in this research is to rely as much as possible on the participant's view of the situation to interpret his/hers/their meaning.

3.2 Research design

The formulated problem in this research is that there is a lack of knowledge on how ecotourism contributes to CBMM. To have an in-depth, detailed understanding of this complex problem, a qualitative research design has been used. A qualitative approach is chosen, because having in-depth interviews creates a more personal relation with the respondents might result in more valid results. According to Creswell & Poth (2018), qualitative research knows 9 different characteristics: 1) The research is conducted in a natural setting 2) involves multiple methods 3) involves inductive and deductive reasoning 4) focuses on participant's multiple perspectives and meanings 5) is situated within the context or setting of sites or participants 6) involves an emergent design 7) is reflective of researcher's background influences 8) relies on the researcher as key instrument in data collection and 9) presents a holistic and complex picture. All these characteristics are taken into account in this research.

For this research, a qualitative case study has been done. A case study is as an approach in which a real-life, present-day bounded case is explored with multiple methods and a case description (Creswell & Poth, 2018). A case study is a suitable strategy for this research, because CBMM in Sri Lanka is a real-life specific decision making process bounded by time and place. To accomplish an in-depth understanding of the cases, interviews, observations and document analyses have been done. To ensure the case study is bounded by time, the decision making process of implementing ecotourism is analyzed since Sri Lanka became the first nation to legally protect all its mangrove forests (Veettil et al., 2023). The government of Sri Lanka, Seacology; a U.S.-based NGO and a Sri Lanka based NGO Sudeesa announced on the 12th of May, 2015 to join a program that focuses on comprehensively protecting all mangrove forests in Sri Lanka (Seacology, 2015). The Government will secure legal protection and provide rangers for coastal patrols (Pearce, 2015). This time is chosen, because from this time on, mangrove forests were nationally protected and CBMM project were widely implemented.

3.3 Case and participant selection

As already mentioned, the design of this research is a case study of Sri Lanka. In this chapter, an explanation is given on why this country is selected and which specific areas are visited and observed.

3.3.1 Case selection

Sri Lanka is selected as a country for this case study, because of societal and scientific relevance. Sri Lanka is having difficult times in managing mangroves and Veettil et al. (2023) even state that mangroves can be considered as one of the most misused ecosystems in Sri Lanka. Furthermore, Sri Lanka has experienced a turbulent past 10 years with a civil war, tsunami and economic crisis. This made the country not attractive for researchers or ecotourists to travel to, because fieldwork and surveys in conflict settings were challenging during that time (Nijamdeen et al., 2023). Therefore, up to

date case studies of Sri Lanka are scarce and needed. To have an in-depth understanding on how ecotourism contributes to CBMM in Sri Lanka, various mangrove sites in Sri Lanka were visited with ecotourism projects. First, research on the internet has been done to indicate where most ecotourism projects were located. In Negombo Lagoon and Madu Ganga Estuary, a relatively high number of boat tour agencies was found. Mainly, because both of these areas consist of mangrove ecosystems and are located at the touristic west coast of Sri Lanka. Therefore, these places were firstly visited to interview boat tour operators about their experiences in ecotourism. Map 1 shows the location of Negombo Lagoon and Madu Ganga Estuary (near Ambalangoda). During the interviews with the Coast Conservation Department and NARA, it appeared Pottuvil Lagoon also consisted of a successful ecotourism project which involved fishing community members. On map 1, Pottuvil is indicated with the red circle on Arugam Bay. This area was, therefore, also visited and fishing community members were interviewed. With help from the Environmental Authority, two successful mangrove ecotourism projects around Galle were also visited.

It was tried to also visit ecotourism projects in the northern part of Sri Lanka to have a broad view on the projects in the country. However, the northern part is hardly visited by tourists in high numbers, because of the recent civil war and the bad infrastructure. This also shows up when looking at the room distribution in Sri Lanka. According to the annual tourism report in 2023, In terms of provincial distribution, the Western Province holds the highest share of accommodations, accounting for 35% of all rooms. The Southern and Central Provinces follow with 26% and 16.6% of all rooms, respectively. Meanwhile, the Northern Province has the lowest number of rooms (Research and International Relations Division Sri Lanka Tourism Development Authority, 2023). Therefore, only mangrove areas in the western and southern provinces of Sri Lanka were visited for interviews.



Map 1: areas visited to interview participants of ecotourism projects (Van Verre Reizen, 2024)

3.3.2 Participant selection

To have an in-depth and holistic view on the process, 18 different actors were interviewed. Besides the interviews, 9 observations were also done to explore the physical setting, participants, interactions, conversations, behavior and activities of the boat tour operator centers. To make a selection of which participants were interviewed, a set of criteria were taken into account.

Since this research explores the conditions of successful CBMM, a set of experts are interviewed who have experience in implementing community-based mangrove conservation projects. In Sri Lanka and the case study areas, these projects have been implemented by mostly government stakeholders from the National Ministry (Coast Conservation Department, Environmental Authority) and several NGO's (Emace, SEDO, Center of Eco-Cultural Studies and Mangrove Museum). Also, the National Aquatic Research and Development Agency is interviewed about this subject, since this agency is responsible for carrying out and coordinating research, development and management activities on the subject of aquatic resources in Sri Lanka, including mangroves (The National Aquatic Resources Research and Development Agency, z.d.). Since these stakeholders have experience in implementing CBMM projects, they were interviewed about the successes and challenges within CBMM and their thoughts about ecotourism as a tool to manage mangrove areas.

To have an idea on how ecotourism might contribute to CBMM current ecotourism businesses were interviewed in different areas of Sri Lanka. In each area, at least two boat tour operators were interviewed to have a broad view on the experiences of the boat tour operators. Although it is tried to

search for ecotourism operating business owners that fit this research’s definition of ‘ecotourism’, some boat tour businesses turned out to be not so sustainable at all. However, it is still decided to take their data into account, since this also shows how ecotourism might not be an efficient tool to use for mangrove management. At every boat tour center, (participating) observations have been done on the products, the buildings, boats and lagoon area. Criteria they all meet is the involvement of local community members in their business, the provision of boat tours through mangrove areas and the use of terms like ‘eco-, green, nature-based’ to sell their products on the internet, which creates an ecotourism image on their business.

In appendix 3, an overview is made of all the participants interviewed and observations made. For every actor, it is mentioned who participated, to which case it belongs and at what location the interview is conducted. Also, which observations have been done on this location.

3.4 Data collection

Since this qualitative research aims at an in-depth understanding of the matter, multiple methods have been used to collect data on the subject. The different methods are explained and argued in this chapter.

3.4.1 Document analysis

First, a document analysis has been done on the current mangrove management system in Sri Lanka. A document analysis is a procedure for evaluating both printed and electronic documents in order to define meaning, gain understanding, and develop empirical knowledge (Bowen, 2009). The criteria for the documents were as follows: the documents had to be 1) on national or case level 2) about Sri Lankan mangrove-management and/or 3) ecotourism in Sri Lanka 4) in use after 2015, 5) used by stakeholders implementing a CBMM or ecotourism project. In this document analysis, the following current mangrove management plans in Sri Lanka are analyzed:

Name	Author	Year	Scale
National Policy on Conservation and Sustainable Utilization of Mangrove Ecosystems in Sri Lanka	Biodiversity Secretariat Ministry of Environment and Wildlife	2020	National
National Strategic Action Plan for Conservation and Sustainable Utilization of Mangrove Ecosystems in Sri Lanka 2022-2026	Biodiversity Secretariat Ministry of Environment	2021	National
National Guidelines for the Restoration of Mangrove Ecosystems of Sri Lanka	Biodiversity Ministry of Environment	2021	National
Guide to Mangroves of Sri Lanka	Biodiversity Secretariat Ministry of Environment & Renewable Energy	2014	National
Sri Lanka National Strategy and Action Plan (2009) Mangroves for the Future Program	IUCN Sri Lanka Country office	2009	National
An appraisal of Mangrove Management in Micro-tidal Estuaries and Lagoons in Sri Lanka	IUCN Sri Lanka Country office	2011	National
Arugam Bay Tourism Development Master Plan 2020-2030	Urban Development Authority Sri Lanka	2020	Pottuvil Lagoon
Development of an Ecotourism Plan for Pottuvil to Panama Region in the Ampara District with special emphasis on Urani, Kottukal and Panama Lagoons.	Coast Conservation and Coastal Resource Management Department IUCN	2016	Pottuvil Lagoon

Master Plan of Muthurajawela and Negombo Lagoon	Greater Colombo Economic Commission and Euroconsult, the Netherlands	1991	Negombo Lagoon
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Table 2 : Overview of documents analyzed

3.4.2 Semi structured interviews

To understand the world from the participant's point of view, semi-structured interviews have been conducted. A semi-structured interview is a method where a blend of closed- and open-ended questions are used which are often accompanied by follow-up why or how questions (Newcomer et al., 2015). The interview guide can be found in appendix 3. This method is chosen, because semi-structured interviews have been found successful in enabling reciprocity between the participant and the interviewer (Kallio et al., 2016). It enables the interviewer to improvise follow-up questions based on participant's responses and it allows space for the participant's verbal expression, which makes this method very suitable for qualitative research. In the interview guide, up to 10 open-ended questions were formulated according to the operationalization scheme. During the interview however, the questions functioned as a guideline and were not all of the time directly asked. Since this research holds a social constructivist approach, the goal was to rely as much as possible on the participant's view of the situation to interpret his/hers/their meaning. Some interviews were conducted online due to travel issues. However, the majority was conducted live in the ecotourism center or government office.

3.4.3 Observations

Finally, in all three lagoon areas and at the boat tour agencies, observations have been done. The observations are based on the research purpose and questions. The physical setting, participants, interactions, conversations, behavior and activities have been observed through a 'complete participant approach' (Creswell & Poth, 2018). This approach means that the researcher is fully engaged with the people he/she is observing and participating in the activity at the site. In every area, boat centers have been observed and in Negombo Lagoon and Madu Ganga Estuary, boat tours were done to gain insider views. The observations have been collected through pictures and with descriptive and reflective notes in a notebook. It must be mentioned that there were some challenges with the mechanics of observing. For example, remembering to take field notes while being in the activity and heavy rains that disturbed the writing of notes. Nevertheless, it is tried as much as possible to write the reflective report shortly after the experience to make sure the findings are reliable. As this research combines interviews, observations and a document analysis, triangulation occurs, which contributes positively to the validity of this research.

3.4.4 Data analysis

Analyzing qualitative data consisted of preparing the data in transcripts/photographs/reports, then categorizing the data into themes through a process of coding and finally representing the data into a figure and a discussion. In this research, the data of the interviews, observations and documents are analyzed and coded with the help of 'Atlas.ti'. In the analysis, the operationalization scheme is used to analyze and categorize the data in a deductive way. However, the data is also analyzed in an inductive way, because it is believed that new insights might be gained when looking objectively to the data (Creswell & Poth, 2018). This way of coding also improves the qualitative aspects of this research (Cresswel & Poth, 2018). The first step was to transcribe all the interviews accurately. The next step was to analyze these transcripts and notes and mark certain elements with codes. Elements were coded which describe information in line with the operationalization scheme or which were surprising, new information. Elements that were conceptually interesting or give contextual explanation on the case area are also coded. After this, the codes were categorized into groups and the relations between the codes and group codes were defined. Within this process, memo's, summaries and noteworthiness of codes were taken into account. Eventually, a figure and discussion of the data was created.

3.5 Validity and Reliability

3.5.1 Validity

There are many types of validation in qualitative research, but in this research it is chosen to use the consideration of Cresswell and Poth (2018), who mention validation “is an attempt to assess the “accuracy” of the findings, as best described by the researcher, the participants, and the readers (or reviewers) (p.338)”. To ensure this “accuracy” by the researcher, participant and reader, multiple validation strategies are applied in this research. First, triangulation has been applied, which means multiple methods and data resources are used to develop an overall understanding of the phenomena (Patton, 1999). The multiple methods are semi-structured interviews, (participant) observations and a document analysis. Another way used to ensure accuracy, is to report data that does not fit the pattern of the pre-thought codes or themes to provide a realistic assessment of CBMM and ecotourism. Third, the researcher’s biases and short-comings will be presented in the discussion section of this research that might have shaped the interpretation of the results.

To ensure the validation by the participant, data, analyses, interpretations and conclusions were sent back to the participants, so they had the opportunity to judge the accuracy of the results and interpretations. Also, it is tried to spend as much time in the field as feasible during the data collection. A focus has been laid during the trip to learn about the culture and context of Sri Lanka’s tourism and mangroves.

Lastly, to ensure the reader’s validation of the research, it is aimed as much as possible to use detailed description of the situations and an accessible writing style. Additionally, a peer-review is done with two fellow students in the master’s specialization ‘Cities, Water, Climate Change’ for an external check on the validity of the research.

3.5.2 Reliability

The reliability in a research is the degree of consistency and transparency when measuring the variable (Vennix, 2016). In qualitative research, it often refers to the stability of responses to multiple coders of data sets (Cresswell and Poth, 2018). To guarantee reliability in this research in the first place, the interviews are done by the same researcher every time with the same interview guide for every actor. Secondly, the transcripts of the interviews are made as accurate as possible including pauses, unfinished sentences and laughing sounds to ensure transparency of the data. Additionally, each interview is coded according to the same well-thought coding scheme, which matches the operationalization scheme from the theoretical framework. The aim is to interpret the data as objective as possible.

4.0 Results

In this chapter, findings from the interviews, observation and document analysis are described and analyzed. To start off with a broad view on the subject, the physical, political and tourism context of Sri Lanka is described in chapter 4.1. Afterwards, the sub questions are answered one by one: What are the conditions for successful CBMM in Sri Lanka? And how does Sri Lankan ecotourism contribute to these conditions?

4.1 Context Sri Lanka

In this chapter, context is given on the broad physical and political aspects of the country to gain some background knowledge on mangrove management. Then, the administrative system of mangrove management will be described and the current uses of mangrove ecosystems.

4.1.1 Physical landscape

Sri Lanka is a tropical island located in the Indian Ocean with a land area of 65,610 km² (Piyasiri et al., 2017). Out of this area, 24% exists out of coastal land (excluding inland water). Sri Lanka has a coastline of 1,338 km (Piyasiri et al., 2017). The mangrove cover is mostly distributed in the coastal areas around the lagoons and river areas. Mangroves in Sri Lanka include 21 species, which accounts for about a third of the world's number of mangrove species (Piyasiri et al., 2017). There are five coastal provinces with mangroves. Presently, circa 25% of the overall Sri Lankan population lives within the coastal region of these five coastal provinces. Furthermore, 70% of hotels and 62% of industrial units are located in the coastal region (Nijamdeen et al., 2023). Map 2 shows the mangrove distribution in Sri Lanka. For this research, Negombo Lagoon, Kalutara/Galle area and Pottuvil were visited to interview boat tour agencies. Near Chilaw Lagoon, the mangrove museum is located.

Sri Lanka has two main seasons: 1) the Maha season, associated with the northeast monsoon (September – March) and 2) the Yala season, associated with the southwest monsoon (May – August)., Sri Lanka is one of the hottest countries in the world, with an average temperature of around 27 - 28°C (World Bank, 2022).



Map 2: Mangrove distribution Sri Lanka (Chandrasekara et al., 2016)

4.1.2 Political landscape

Sri Lanka is a democratic republic. Since the adoption of the new Constitution in 1978, Sri Lanka has had a presidential system that grants strong powers to the president. The president holds the executive power and, as head of state and government, appoints (and dismisses) the members of the cabinet and organizes elections. However, the President is also responsible for appointing judges to the Supreme Court, the Court of Appeal, and the High Courts (*Government Of Sri Lanka, 2023*). The last task for the president is to lead the armed forces and the police. The president is elected for a period of six years and is eligible for re-election (Directie Consulaire Zaken en Migratiebeleid Afdeling Asiel, Hervestiging en Terugkeer, 2011). Ranil Wickremesinghe is the current president.

Next to the President, there is the Parliament of Sri Lanka holding legislative power. The Parliament consists of 225 members (*Government Of Sri Lanka, 2023*). Of these, 196 members are elected in multi-seat constituencies, while 29 are chosen through proportional representation.

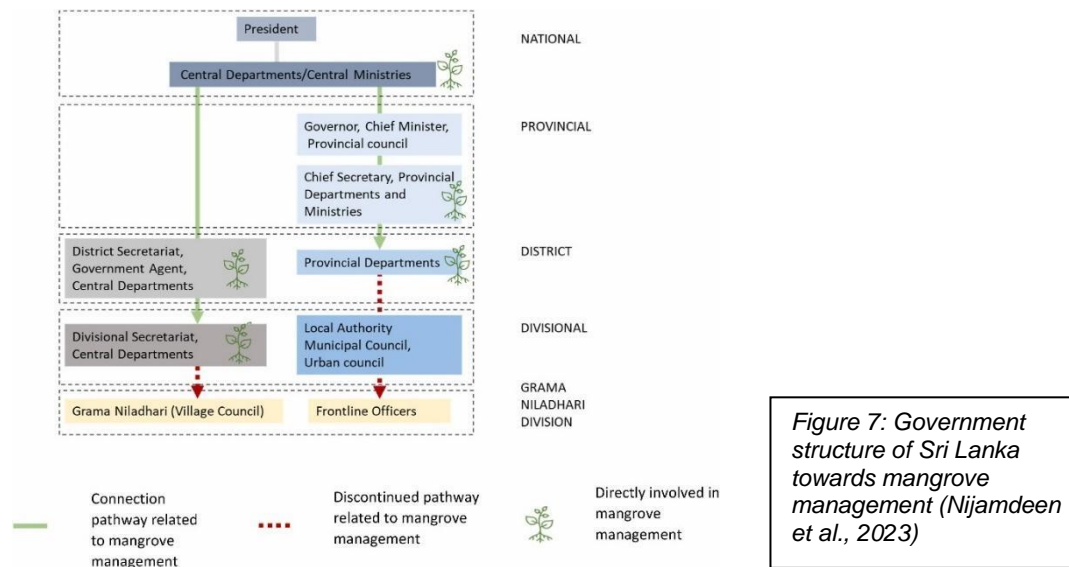
Sri Lanka's judicial system consists of a Supreme Court, Court of Appeal, High Courts, and a range of subordinate courts. The legal system in Sri Lanka reflects a mix of cultural influences due to the history of colonization and presence of different cultural groups.

Current political situation

The past years have been turbulent for Sri Lanka. In March 2022, The Aragalaya protests emerged, where thousands of people demonstrated, because of medicine shortages, rising prices, long power cuts and a shortage of fuel and food. Sri Lankans from different religions, generations and ethnicities came together to collectively protest the Gotabaya Rajapaksa-led government. They demanded political change and accountability for economic crimes (Naila Rafique, 2023). The nonviolent protests led to the resignation of the Rajapaksa family. However, in the time since, very little has changed for the country. Sri Lanka continues with serious economic and political challenges. Sri Lanka now has to restructure its debt and address critical national issues such as financial stability and food security for average families. There has been little progress toward addressing concerns related to democratic resilience and rebuilding trust between government leaders and Sri Lankan citizens (Naila Rafique, 2023).

4.1.3 Mangrove management in Sri Lanka

Sri Lanka is the first nation in the world to formally protect all of its mangroves by jurisdiction and has specific policies for mangrove management (Nijamdeen et al., 2023). Mangroves are protected and managed by the Forest Department, the Department of Coast Conservation and Coastal Resource Management, the Central Environmental Authority, the Department of Wildlife Conservation, the Marine Environment Protection Authority and the Department of Fisheries and Aquaculture. The National Aquatic Research and Development Agency (NARA) and the International Union for Conservation of Nature and Natural Resources (IUCN) are also involved as research entities. Since mangroves are located at the sea-land interface, confusion does exist regarding responsibilities, collaboration and formal rules (Nijamdeen et al., 2023). Figure 7 shows the government structure from Sri Lanka of possible pathways towards mangrove management (Nijamdeen et al., 2023). From the president towards frontline officers and village councils. In figure 7, green connections demonstrate direct pathways, red connections demonstrate discontinued pathways. It becomes visible there are no clear relations within the lower segments of mangrove management.



Recent amendments of the law provide a legal basis for inter-sectoral (inter-agency) collaboration to promote resources management and environment conservation. Laws and legislations for mangrove protection include the Forest Ordinance (1907), the Soil Conservation Act (1951), the Tourism Development Act (1968), the Urban Development Authority Law (1978), the National Environment Act (1980) and the Coast Conservation Act (1981), which is responsible for defining the coastal zone in the country (Veetti et al., 2023).

Sri Lanka considers 'zonation' as a key strategy in coastal zone management (Iftekhar, 2008). Zonation means the mangrove areas are divided up into five zones: 1) protection zone, 2) multiple-use zone, 3) rehabilitation zone, 4) reforestation zone and 5) buffer zone. In the multiple-use zone and reforestation zone, participatory management involving community groups is considered the main approach (Iftekhar, 2008).

Furthermore, Sri Lankan policies on mangrove management represent a lot of plans, strategies and guidelines to sustainably manage the mangrove forests. Overall, Sri Lanka wants to protect traditional knowledge on mangroves and beneficial multi-stakeholder partnerships between local communities, public agencies, the academic and research community and investors. This will, among other things, be done through improving access to data, creating key stakeholder participation and innovative financing mechanisms. Furthermore, to identify most significant and important threats for mangroves, they want to set targets for tourism, aquaculture, fisheries and saltern practices to make these industries mangrove friendly. They highlight the potential for win-win coexistence between traditional coastal land use and tourism in their policies.

4.1.4 Use of Mangrove ecosystems

From a socioeconomic view point, mangrove ecosystems generate large scale income to the local population in Sri Lanka. Exportation of shrimps, prawns and lobsters brings high profit to the country, next to tourism, timber, and medicinal use of the mangrove forests (Veettil et al., 2023). Furthermore, A number of Sri Lankan mangroves are either edible or used to produce edible products. For example, mangrove apples are used to prepare juices and ice creams and the leaves of *Acrostichum aureum* are used for making salads and curry (Veettil et al., 2023). These uses lead to overexploitation of the mangrove forests, since these developments are based more on financial benefits than environmental impacts on a long term scale. This causes conflicts between stakeholders (Veettil et al., 2023). The level of overexploitation of the mangrove forests differs per region, depending on the mangrove species and characteristics of the community members (Veettil et al., 2023). Veettil et al., (2023) mention that major threats to Sri Lankan mangroves are 1) tourism activities; 2) pollution (including oil spills and garbage); 3) salt ponds, sand mining and aquaculture 4) removal of shells, herbivores (crabs) and 5) rapid urbanization.

4.2 Conditions for successful CBMM in Sri Lanka

In this subchapter, the conditions for successful CBMM in Sri Lanka are discussed. Kodikara et al. (2017) investigated the effectiveness of mangrove planting initiatives in Sri Lanka in their study. After the 2004 tsunami disaster, the central government and some NGOs realized the significance of mangroves that serve as a natural barrier against the wave storms and initiated projects for restoration and replanting at selected locations in Sri Lanka. Kodikara et al. (2017) found that only 200-220 ha out of 1,000 – 1,200 ha of restored mangroves survived and were successfully restored. How come only so little projects succeeded? What are the conditions for successful CBMM in Sri Lanka?

4.2.1 Technical conditions

In Sri Lanka, challenges often occur in CBMM projects, because the technical conditions are not sufficiently taken into account. In this chapter, a description is given on how Sri Lanka meets the technical conditions formulated in the conceptual model.

Ecological knowledge

The key reason that Kodikara et al. (2017) mentioned for the failure of post-tsunami mangrove restoration is poor understanding of the environment and vegetation interactions. Ranasinghe (2012) also states the following key reasons for failure of many mangrove reforestation efforts in Sri Lanka:

- a) poor selection of planting sites without proper assessment of environmental conditions;
- b) inappropriate species selected for planting;
- c) improper substrate depth beyond natural range where mangroves can survive.
- d) lack of sufficient monitoring of seedlings after the reforestation campaign;
- e) inadequate knowledge, particularly about the ecological role of mangroves, of people involved.

Mr. Sandaruwan, participant and researcher at NARA mentions the problem in the interview as follows: *“Sometimes they are planting without having many ecological ideas and plants may invade. This is a very big problem to the ecosystem. Community people have to know that kind of biological ideas.”* He illustrated a scenario: *“If you tell a participant this: ‘if you are planting ten mangrove trees, I will give some money.’ When this project comes, they plant whatever they can. Those species may not be compatible with your environment. Sometimes the plant is destroyed before it’s grown or sometimes the plant is an invasive species”.* This illustrates the importance and the current lack of proper ecological knowledge of participants on CBMM projects in Sri Lanka.

Mr. Janaka, participant and owner of the ecotourism boat tour company ‘Eco Escape’ also realized that people in his neighborhood do not have knowledge about ecosystems: *“People love to protect the environment, but they don’t know the biodiversity... If we directly try to answer the climate adaptation issue, we are going to mess up with the biodiversity of the area. Because we are planting a lot of wrong plants in the natural resources.”* He, therefore, decided to let nature develop itself and interfere with nature to the bare minimum in the project.

For The Education Officer from the Mangrove Museum, the lack of ecological knowledge on mangroves in Sri Lanka was the reason to start a museum: *“We started this museum to share our traditional and modern knowledge about mangroves, especially for community members, because they know mangroves as generally, but they do not know how to manage it in a very sustainable manner.”* She mentions the importance of post-care: *“They all want to plant a mangrove, but they do not care about it. They do not know about the technology. They have a planting campaign for one or two days and after that, they go. But in our sea ecology projects, we have done this post caring and we can see big, high mangrove trees in those restored sites.”* With post-care, she means day to day caring like taking water and replanting. Post-care is, therefore, an important factor to guarantee successful mangrove conservation.

Important to mention is that not only community participants occur to have inadequate ecological knowledge, also political actors like district officers, government bodies and policemen tend to lack in their knowledge on mangroves. *“The government, the divisional secretaries or the district secretaries, they don’t have an idea about the environment. Sometimes, they do not give permission to a*

community organization, because they think a mangrove project may be a harmful event for the environment..” Is what Dr Manoj from the Environmental Authority tells in his interview.

Mr. Janaka explains that this lack of knowledge among government members is caused due to a mismatch between the background study and job function. For example, Sri Lankan people can work at the Environmental Authority, but have a background in Engineering, which makes them not aware of the biodiversity aspects of the mangrove site. A police officer from the Environment Unit spoke at a congress of World Environment Day and said the most difficult issue he is facing regarding the mangroves is that the officers do not know the mangroves. Officers can't identify the mangroves, because their background is in the police academy. For this reason, Dr Manoj Prasanna, from the Biodiversity Secretariate, wrote a handbook on how to identify all mangrove species.

Overall, a lack of ecological knowledge within Sri Lanka often causes harm to the mangrove environment, the death of planted mangrove trees and no permission for new CBMM projects from the government. It can, therefore, be concluded that Sri Lanka does often not meet the condition '*Habitat and diversity factors of mangroves are taken into account and ecological dynamics are maintained*'. A lack of ecological knowledge on mangrove restoration causes a high number of unsuccessful CBMM projects.

Technical support

An important factor to overcome a lack of knowledge is the providing of education and training programs on mangrove conservation. In the interviews, this is also described by the participants as a major cause for success in CBMM projects. In Sri Lanka, technical support is given by the government bodies, but due to the financial crisis nowadays, they mostly collect funding from International NGOs. Board members from EMACE, an NGO conducting CBMM projects, explain how training creates an ownership feeling that is highly important in conserving mangroves: *“The major challenge is the lack of awareness of the people of the importance of the mangrove. We spent a lot of time, in fact, months and months to educate them. And without education, as I said, the ownership is not transferred to them... Initially, before we start any activities, we do the mangrove education program, until they get sensitized to the environment. That is the most important part... When you just pay them and get them to plant, they don't have the feeling of ownership to take care of the plants, because they are working for money. We should change the mindset of the people. Even if they get \$5 a day for planting mangrove, they should not say: 'I am getting \$5 a day. That is why I am planting trees.' They should say: 'I am doing this job to save the planet, for that I am getting \$5.”*

In short, it means that through technical training on the importance of mangroves, community members create a more sensitized and ownership feeling towards the mangroves, that causes continued participation and commitment of the participants. Technical training can therefore be described as a highly important condition for successful CBMM projects. It could also reduce the costs of a project, because EMACE mentions that at a certain point, community members feel so sensitized towards the mangrove environment, they will participate without getting paid.

On the question how this training should be organized, several answers arise. Mr. Upali Rathnayake, Deputy Director at the General Ministry of Tourism, highlights the importance of regular training: *“The thing is, the community who is not well educated tend to forget the knowledge. Therefore, you have to remind again: 'Too much harvest will damage the mangroves.' You have to remind them again and again. So therefore, this training will have to be on a regular interval.”* Regular training also prevents newcomers in the project from missing out of the mangrove education.

Besides, training also has to be given on *“Ground level”* as Mr. Janaka, from Eco Escape Boat Tours, explains: *“the technical experts, they are explaining on their level, not the ground level. That's why people can't understand what they are saying.”* He explains that training should be easily accessible and matters should be explained with real life experience, otherwise the community members will not understand. Another condition to ensure the training is accessible, is to give the training for free. EMACE, The Environmental Authority and the Tourism Authority, all provide the training for free and mention this is important to increase the number of participants and create capable leaders.

In summary, technical support in using the right applicable mangrove species and creating awareness on the importance of mangroves can be seen as an important condition for successful CBMM projects.

The training creates an ownership and sensitized feeling towards the mangrove sites which increases the number and commitment of participants. To increase the positive effects of the training program, training should be accessible for community members and given on a regular basis.

Boundaries

In the theoretical framework of this research, it is mentioned that a clear definition of 'user boundaries' and 'resource boundaries' is an important condition for successful CBMM. Although Ostrom (2008) intensively highlights the importance of these clear boundaries, it is (quite surprisingly) not particularly mentioned in the interviews as a successful or failure aspect in CBMM projects implemented in Sri Lanka. The reason for the absence of this condition is not hundred percent clear. It might be that the clear definition of boundaries only becomes important for the participants if the rest of all the challenges (f.e. lack of ecological knowledge, funding and clear responsibility tasks) are already solved.

It cannot be concluded that the definition of clear boundaries is not important at all. Although it is not particularly mentioned in the interviews, successful projects in Sri Lanka still show the importance of user boundaries, since they have a clear division between legitimate users and nonusers via a license system. For example, projects that involve fisheries organizations are relatively successful and consist of clear user and resource boundaries, since the fishermen are the only ones allowed on the particular lagoon. Furthermore, project leaders do experience difficulties in user boundaries when organizing their education programs, because people from outside areas join the program who are not part of the local community living around the lagoon. Therefore, user and resource boundaries are still important conditions that cause successful CBMM, but not particularly mentioned by the interview participants.

Monitoring

Another technical condition that ensures successful CBMM, is monitoring of the projects. Mr. Sandaruwan (NARA) mentions this is a big challenge within CBMM in Sri Lanka: *"Actually it's a big problem happening everywhere in this country. Most of the mangrove projects start, but execute after some certain time, because the government or NGO stopped the project. After they stop, the project is not properly handed over to the community. And when the technical support is not there, the community cannot sustain the project... Therefore, this kind of long term monitoring is very important."*

EMACE also agrees that long-term sustainability is one of the major challenges within Sri Lanka. To ensure their project is sustainable in the long-term, they introduced a "Youth brigade" to monitor the environmental degradation activities around the lake. This brigade consists of young graduates who studied in environmental sciences and are willing to devote their time to monitor the project. With informants in the villages, cameras and social media, they try to undertake action whenever someone destroys or pollutes the mangrove lagoon. EMACE provided their technical training.

In their book on Participatory Mangrove Management in a Changing Climate, DasGupta and Shaw (2017) mention 2 successful mangrove conservation case studies in Sri Lanka. Here, the involvement of the government by providing legal protection and coastal patrolling for monitoring were the key reasons for success.

Overall, it is an important condition for successful CBMM to have one party that monitors the project on its environmental aspects. For this, the question arises who is responsible for that task. Who is responsible for leading the project (after the government/NGO support stops)? Who checks whether the rules are being met? And if someone breaks the rules, who will hand out what kind of punishments? In dividing these responsibilities, several challenges occur, because of the complicated structure of the political system in Sri Lanka. Therefore, further explanation on this topic is given under the next subchapter 'political conditions'

4.2.2 Political conditions

In this subchapter, a description is given on how Sri Lanka meets the political conditions formulated in the conceptual model.

Strategic collaboration

In order to have a successful CBMM project, it is firstly important to have a strategic collaboration between the government bodies, community members, NGOs and other involved stakeholders. There should be clear responsibility tasks, fair power distribution and no communication barriers. In the case of Sri Lanka, this often occurs as a challenge. Ranasinghe (2012) states that poor coordination among the institutions and organizations involved in the campaign is a key reason for failure of many mangrove reforestation efforts in Sri Lanka. Veetti et al., (2023) also mention that major limitations in mangrove management in the country are communication barriers and a lack of knowledge among the institutions on the environmental importance of coastal vegetation and resources for mangrove conservation. In his interview, Mr. Janaka mentions that he bumped into this problem while conducting his mangrove conservation project: *“The government body says: ‘this is not my job, this is from another party’. So who has the responsibility?”*. Among the participants, there was a wide-shared opinion that local government bodies involved in the CBMM project had a lack of responsibility and mainly thought about their own interest, particular task and their own concerns. Weerakoon et al., (2020) state that this problem can be caused due to the involvement of numerous organizations, each with their own mandates and agenda work in the same area with little or no reference to each other. Also, the multitude of policies and laws brings confusion into the management of a coastal area.

Therefore, Weerakoon et al., (2020) recommend a shift to an integrated inter-sectoral approach in coastal ecosystem management. A proper inter-sectoral approach can provide government support to CBMM projects with minimum bureaucratic interference (Senarath & Visvanathan, 2001). About such a form of management, Dr. Premathilake, deputy director of the coastal resource management unit at the Coastal Conservation Department (CCD), also says in his interview: *“In special management areas, we bring local government agencies, communities and also the educational groups, academics into this forum. We make a committee under chairmanship of the divisional secretary who has the power to coordinate with all agencies. Then, we vote on arrangements.”* Some participants mention the collaboration between all parties is good and works very well, because they collaboratively decide on important decisions. However, it is also mentioned that the divisional secretary and local politicians do not always implement the arrangements and obey the decided rules 100 percent. Due to the administrative system, local government bodies have a lot of power compared to the other parties. This power is sometimes used in their own favor, which results in favoritism and nepotism. Also, Special Management Areas cannot be defined as true community-based mangrove management, because the community is not in self-control. Mr. Upali Rathnayake (Tourism Authority) mentions that a CBMM project should not be a *“government agency controlled program”*, but a *“community governed program.”* About community self-control, Dr. Premathilake (CCD) mentions this is almost impossible in Sri Lanka, because of the administrative system and the power of local government bodies. *“Here, we can mainly do collaborative management: government agencies, communities, academics all collaborate to manage the things.”* Special Management Areas are therefore a good attempt to create more integrated, inter-sectoral mangrove management, but due to unequal power distribution, collaboration is still a challenge.

Sri Lanka knows, overall, a complex political system regarding mangrove management and the multitude of policies and laws brings sometimes confusion into the management of the area. The question arises who is responsible for what task and the opinion of the interview participants was that government bodies sometimes lacked responsibility. To overcome this, Special Management Areas are introduced as an inter-sectoral approach. However, power in this collaboration is not always equally divided, which makes strategic collaboration on mangrove management in Sri Lanka sometimes a challenge.

Management plans

A way to create strategic collaboration is to implement a revised management plan in which all responsibilities are divided among the stakeholders and goals and actions are formulated to conserve the mangroves. In Sri Lanka, several mangrove plans and policies are known. However, although management plans exist, to engage people in the project, an executing mechanism is the most important. Mr. Sujeewa Jasinghe, Managing Director - Centre for Eco-cultural Studies (CES), explains in his interview that these executive mechanisms are very rare in Sri Lanka. *“Only the management plans are there. But what is important is to engage the people, having an execution plan. An implementation plan in which different stakeholders can come and join and contribute to the different things.”* Mr. Sajeewa, CBMM project director, also mentions that a lack of management plans hinders the implementation of new projects: *“Still, I can’t see the master plan for it. All these relevant authorities, conservation organizations: come up with the master plan! Then, we can get the approval for a project and implement it.”*

Overall, Sri Lanka does meet the condition of having a national mangrove management plan, but the problem is that this management plan is missing out on enough executing mechanisms to create direct engagement.

Support by all levels of the government

Another important condition mentioned in the conceptual model is support by all levels of the government. As already mentioned, Sri Lanka knows a complex administrative system in mangrove management with many government bodies involved. In general, it can be stated that the national government bodies are well willing to support CBMM projects, since they are often the initiative holders, have the ecological and technical expertise and recognize the importance of mangrove conservation in the country. This can also be concluded when looking at the national mangrove management policies.

However, in the political system, not national authorities, but local authorities and district secretaries have most power in decision-making processes. They are the ones who need to give permission for the project and they allocate funds to local initiatives. The key problem is that these actors are also the ones who sometimes lack environmental awareness, as already mentioned earlier. This means that a project can be fully supported and even initiated by national government bodies and still fail due to political interference from local authorities. In the interviews, this problem of political interference often came to light. All national government bodies recognized the problem and could mention at least one project that had failed for these reasons. Not only was the lack of local government support highlighted by the interview participants, it also came to light during the conduction of interviews for this research. It was tried three times to conduct an interview about mangrove management with district level authorities, but, especially compared to the national level of government bodies, district authorities did not seem to understand the question and were not able to give useful information about mangrove management in their region. Mr. Sandaruwan, researcher at NARA, describes that the problem with local authorities has two sides: *“Or, you as initiative holder, neglect the local authorities, but this means the project will probably fail, because they will try to stop you. Or you start a negotiation, but this means favoritism or nepotism might occur. For example, instead of involving vulnerable people in the project with low welfare, people who are favored by the local authorities will be involved to gain more votes.”* To deal with this problem, participants mention it is important to understand the social political context of an area. Sometimes a bottom-up approach does not work and it might be more effective to first recognize the local community leaders, but in some regions it might be more effective to include powerful religious leaders to the project. This is different for each region.

Overall, support for a CBMM project cannot always be found on every government level in Sri Lanka. Local authorities and district secretaries tend to negatively interfere with a project, due to a lack of environmental awareness and a desire to gain votes. However, this is not always the case and it is possible to overcome this challenge when an approach is used that takes the social-political structure into account carefully.

A mechanism for conflict resolution

In the theoretical framework of this research, it is mentioned that a mechanism for conflict resolution is an important condition for successful CBMM. Ostrom (2008) explains that there should be graduated sanctions when people violate the operational rules and rapid access to low-cost local arenas to resolve conflicts among appropriators and officials. Among the interview participants, the importance of a mechanism for conflict resolution is, quite surprisingly, rarely mentioned. The reason for this is hard to conclude directly, but it could be that conflicts hardly occurred in the projects and other challenges were considered more important. Having a good mechanism for conflict resolution comes hand in hand with clear division of tasks and responsibilities among the participants and a well-functioning monitoring body. As already mentioned, these aspects were lacking in many projects in Sri Lanka.

However, there is also a chance that projects already had a proper functioning resolution mechanism which made it not worth mentioning in the interview. There is, for example, already a lot of legislation on degradation of mangroves and people in Sri Lanka are aware of the crime of cutting mangrove trees and polluting the lagoon.

Noteworthy is that CBMM projects that worked with fishery organizations (Pottuvil Lagoon), had a clear mechanism for conflict resolution. Fishery organizations include all fishermen that are legally allowed to catch fish of a specific lagoon. The organization is led by a board of community fishermen who make agreements on environmental concerns, techniques, financial support and legislation. Pottuvil Fishing community representatives tell that *“when a fisherman wants to join the organization, he writes a motivation letter and has a probation period for one year in which he needs to respect the rules. If you do not obey the legislation, you are out of the organization”*. This conflict mechanism works well and is noteworthy, because this makes a fishermen organization a good community-based partner to collaborate with in CBMM projects.

In general, mechanisms for conflict resolution in Sri Lanka were rarely mentioned as an important condition for successful CBMM in the interviews. On the one hand, it might be that clear responsibility tasks, a monitoring body and support from local authorities are already such big challenges that come hand in hand with good conflict resolutions, that it was not worth mentioning separately in the interviews. On the other hand, it might be that the current legislation on degradation of mangroves is already well-working and it is not experienced as a mentionable challenge of CBMM projects, because it is working unconsciously. CBMM projects that work with fishermen organizations do already have a potential conflict resolution, which makes the projects overall successful.

Capable leaders

Capable leaders are people that lead the project and stimulate collective and active involvement and action of all stakeholders. They are passionate about conserving mangroves and keep close, long-term contact with the community members and take responsibility. These capable leaders are an important condition for politically successful CBMM projects. In Sri Lanka, there can be found a lot of people who take initiative and set up a community project to create more welfare for the livelihood and environment. Especially since the Tsunami in 2004 and the past economic crisis years, more community based mangrove projects have been set up. A lot of project leaders can be found in government departments. However, Dr. Premathilake, deputy director of the coastal resource management unit, explains that the department has not enough budget, capacity and staff members to provide the level of support they actually want. *“Because they are more than 100 km away and we cannot regularly visit them. This kind of community work needs regular meetings with the community. You need to discuss with them, identify their problems and continuously help them. That is needed, because they get motivated quickly and also get frustrated quickly.”* He also mentions regional departments cannot offer such help to the community, because *“working with the community is a separate subject. It needs some kind of special skills and training, but in the department, we have a very small number of these people. As a government department, we have very limited resources in that area.”* The lack of budget, staff members and capacity within the government bodies is widely known among the interview participants and at this moment in time blamed on the economic crisis from the past years. *“Nowadays the government can't support it, because of the current situation. It's very bad for our country.”* Tells Mr. Faizarsulfi, a community-based mangrove project leader. Dr. Manoj Prasanna, from the Biodiversity

Secretariate, also mentions that the lack of budget and resources affects the desired level of support: *“the main challenge within these projects is that we can't continue the training. We can't provide some extra facilities to them.”* Due to the current political and economic situation in the country, capable leaders who take initiative begin to rise within NGO's and the community itself. About this community involvement, more information will follow in the next chapter.

In general, Sri Lanka knows a lot of government bodies who want to take initiative and lead a CBMM project. However, working with communities asks for patience, time, budget, training and continuous help. Due to the current economic crisis in the country, government bodies cannot offer such help in every way. For this reason, NGOs and community members begin to take more responsibility in the projects.

4.2.3 Social conditions

In this subchapter, a description is given on how Sri Lanka meets the social conditions formulated in the conceptual model.

Community participation and community benefits

A social condition for successful CBMM projects, is a committed participation of the community members to the project. How do leaders of CBMM projects in Sri Lanka create this commitment of community participants? The answer to this question is mostly through creating financial community benefits. Since community benefits are heavily related to the economic perspective of this research, the following economic conditions will also be discussed in this chapter:

- *A project that covers the quality of life of low-income families (Suharti et al.,2022).*
- *a method that is oriented towards conservation of biodiversity and at the same time focused on increasing productivity for financial benefits (Ginantra, 2022).*
- *A distribution of benefits that is in accordance with the costing a stakeholder has made (Suharti et al., 2022) (Ostrom, 2008).*

Representatives of EMACE, an NGO initiating CBMM projects, tell how they experience their challenge in involving the local community. *“The average village community does not have any kind of interest in the restoration of mangroves. The reason for this is, because there is no direct benefit in restoring mangrove trees.”* Other interview participants also mention this challenge. Since the economic crisis in Sri Lanka, people tend to be more focused on making money instead of spending time on a voluntary project to protect mangrove trees. Mr. Sajeewa, Project Director at the Nagenahiru Information Center, says: *“In Sri Lanka, all the people have struggled to make their life better, because of the economic crisis. The most important thing for the people is to make some money to maintain their life... You know what is happening if you are not giving any economic benefits to the community? Then they are not coming for conservation things. They don't want conservation. Thing is, they want something to eat.”* He explains that he tried to create this direct benefit of restoring mangrove trees, by handing out small loans and supporting their livelihoods in return. For example, improving infrastructure, funding start-up handcraft businesses and organizing education programs.

In other projects, loans are also granted for people who participate in the project. The Education officer from the Mangrove museum explains it is important to have two objects in a project, *“a community benefit and a conservation benefit”*. In their projects, they build community groups. These community groups, which consisted mostly of women, conserved mangrove sites in their neighborhood and they got loans to upgrade their organization and invest in their livelihood.

However, there is also a risk in providing loans to motivate participants. Mr. Sandaruwan from NARA explains that he experienced this and made people join a project with wrong intentions: *“Only for the loans, and not because they are concerned about the environment”*. EMACE also faced this problem and stopped providing loans, but started to give free training to the community members about the importance of mangrove ecosystems and create a *‘sensitive and responsible feeling towards their mangrove environment... They should give prominence to save the planet’*. Not everyone can join in these trainings, but they selected suitable people who have motivation to conserve the mangroves. Mr. Sujeewa Jasinghe, Managing Director (CES), also mentions the importance of creating an ownership feeling among the community members towards the mangroves. *“If a community member started to plant a tree five years ago, he/she creates an ownership feeling towards that tree. The tree will be protected, because he/she will stop the person who is about to cut their tree”*.

The board of the Mangrove Museum uses, besides educational programs, also the strategy to create community partnerships. This means certain community people, with low-welfare and high motivation, are selected to participate in the project. For example, women who have low job opportunities or fishery organizations. *“Because they have a higher value of mangroves.”* It is given that conserving mangroves is especially valuable for fishermen, because fish catch increases when mangrove environments are protected. Mainly, because mangroves serve as important nursery and breeding grounds for many fish and invertebrate species. Therefore, it is easier to convince them of the direct benefits of conserving mangroves. Meanwhile, local fishermen have a lot of knowledge on the lagoon, the mangroves and boat techniques. In this way, you make use of the local wisdom. This is also a reason why successful CBMM projects in Sri Lanka often involved fishery organizations.

In short, NGOs and governments in Sri Lanka often experience difficulties in convincing local communities to actively participate in their CBMM projects, because the community does not see its own benefit in the matter. Therefore, project leaders try to create a community benefit via investments in the livelihood or providing loans. However, providing loans is risky, because people might join only to earn easy money. To prevent this, it is important to create environmental awareness among the participants. It is recommended to select community members and work together in community partnerships. Especially with fishery organizations, because they have direct benefits from mangrove conservation as the fish catch will increase.

Support from the neighborhood

In order for a CBMM project to successfully work out, there has to be enough support from the neighborhood. In Sri Lanka, interesting social situations arise in a neighborhood when implementing a CBMM project, because the attitude of Sri Lankan people tends to be quite *“greedy”* according to the interview participants. This attitude is mainly caused due to tensions in society due to the unstable political and economic situation in the country (crisis, civil war). People are concerned about their financial and political status in society.

As mentioned, in CBMM projects, certain people from the community are often selected to participate in the project according to their welfare status and motivation. In neighborhoods, this often causes a jealousy feeling among the community members. Mr. Sandaruwan explains how community members might feel and act: *“What is my part? That is the greedy idea. You come to the village and you are giving a really good project for the people. But I am not in that circle. I am not the actual person fit for your project. I have no space in this project. Then I start to work as the enemy.”* This attitude is recognized among more interview participants. In general, it can be said that Sri Lankan people feel jealous when someone in their neighborhood *“climbs up the ladder”*. However, it must be mentioned that this jealousy feeling among community members is not in every area the same. A strategy to gain trust from the community and prevent conflicts within the neighborhood is to understand the cultural and social context of the area before approaching the community. Dr. Premathilake, deputy director of the coastal resource management unit, explains that a project initiative holder has to understand the local concerns, environment and setting before implementing a project. Otherwise, the project will fail. In some areas, for example, different ethnic groups live together and they have a different manner of thinking and decision-making. In that case, you, as a project leader, need to decide if you are going to carefully mix these groups or make a division based on cultural aspects to prevent conflict.

Overall, due to the unstable political and economic crisis in the country, people in Sri Lanka tend to have a greedy and jealous attitude towards people “*climbing up the ladder*”. Therefore a lack of support from the neighborhood often causes CBMM projects to be challenging. To overcome this challenge, it is important to gain trust from the local society and carefully understand the social and cultural context of an area before you start a CBMM project.

Community decides

In the theoretical framework of this research, it is mentioned that a community should be the one making decisions about the CBMM project and receiving the benefits. Remarkably, it is impossible to let the community independently decide on the management of an area in Sri Lanka. This is due to the administrative system and the power of local authorities already discussed in chapter of political conditions. However, to create as much influence in the decision-making processes as possible, it is advised by the interview participants to start a community organization. Through this community organization, village leaders, key informants and all the people who have power to influence the people can participate in decision-making processes. Dr Manoj Prasanna, from the Biodiversity Secretariate, also recommends: “*The community itself has to build their community organization. They can register under the government Central Environmental Authority or the divisional secretariat office.*” In practice, such community based organizations do exist in Sri Lanka, but due to the administrative system they cannot have the decision-making power as desired in the research literature on successful CBMM. However, as read in the theoretical framework, Wickramasinghe (2017) shows in his case studies that the involvement of the central government can also be considered as a crucial factor to guarantee long term sustainability. In many cases of Sri Lanka, this also happens to be true. Local communities do not possess a sufficient financial budget, facilities, legal power, knowledge and enough capable leaders. Therefore, they are dependent on central governments and NGOs who can offer this to them. For this reason, it can be doubted whether it is a big problem that communities do not have the administrative power to make decisions on their own. Would they have enough knowledge and capacity to carry this responsibility? An answer on this question cannot be directly given, but it happens to be that current CBMM successful projects mainly thank their success to good collaboration between the community and government bodies. For example, the two successful mangrove conservation case studies mentioned by DasGupta en Shaw (2017), key factors to success were the involvement of the government by providing legal protection and coastal patrolling for monitoring. To start an alternative livelihood or business, participant community members were first given proper training and awareness and then offered job training with microloans. Another key element was the financial and logistical support given by external organizations that resulted in a feeling of importance by the community and positive outcomes. In these cases, minimal power of the community in decision-making processes did not occur to be a problem.

Overall, it is impossible to let the community independently make decisions on mangrove management in Sri Lanka due to the administrative system. According to the theoretical framework, this might create a problem for the successfulness of CBMM projects. However, since Sri Lankan communities do not always possess a sufficient budget, knowledge and capable leaders, it can be doubted whether this forms a big problem within the successfulness of CBMM projects, if the intentions of the decision-making parties are to support the communities.

4.2.4 Economic conditions

In this subchapter, a description is given on how Sri Lanka meets the economic conditions formulated in the conceptual model.

Funding and generation of income

The first economic condition for a successful CBMM project is sufficient funding/generation of incomes to sustain the project in the long-term. Due to the current economic and political crisis in Sri Lanka, this occurs to be a key challenge for many CBMM projects. The Education Officer from Mangrove museum calls it a very big problem within CBMM in Sri Lanka. *“The government cannot directly support projects of NGOs, because they do not have enough money.”* Due to the lack of money, ambitious project initiative holders are not able to realize their ideas. This makes projects primarily dependent on the funding of (international) NGO’s. To gain their attention, good marketing and public relations are needed. *“How it comes to the internet...”,* describes Mr. Sajeewa, CBMM project director, *“...Our website is one of the webs at the top level of the internet, that is an advantage.”*

Mr. Sandaruwan (NARA) remarks that the key problem is not always a lack of funding, but also the lack of long-term sustainability of the project: *“They are pumping money for a certain time, but when the funding stops, the project collapses. It’s not a viable and sustainable thing.”* Project holders in Sri Lanka therefore need to think of other income generation activities and the utilization of funds. A successful CBMM project provides, next to an ecological benefit, a financial benefit for the community as well. *“The thing is, as an organization, we can’t always depend on the fund’s donors... We want to make some income generation activities to get our own funds and utilize that fund for our activities”* Mr. Sajeewa mentions in his interview. To have a sustainable project in the long-term, the project holders should therefore try to be economically independent and create their own income generation activities. This makes project participants also more resilient in times of crisis.

Overall, lack of funding from the government due to the economic crisis is mentioned to be a major challenge within CBMM in Sri Lanka. Projects are mainly dependent on international funds from NGOs to realize their ideas. To gain their attention, good marketing and public relations are needed. Furthermore, the key problem is not always a lack of funding, but the financial sustainability of a project in the long-term. Project holders should utilize their funds and create other income generation activities to become economically independent and create financial benefits for the community in the long-term.

4.2.5 Conclusion conditions CBMM

Overall, almost all conditions formulated in the conceptual model determine in Sri Lanka whether CBMM projects turn out to be successful or not. Key factors to success are financial, technical and logistical support given by other organizations, to guarantee participation, a community benefit and environmental awareness among the community members. However, still many projects in Sri Lanka face challenges with a lack of support from the local government and neighborhood, unclear division of tasks and responsibilities and use of wrong mangrove planting methods, causing projects to be unsuccessful. After having discussed the presence or absence of all conditions for successful CBMM in Sri Lanka, it is time to zoom in on the role of ecotourism. In the next chapter, an analysis is made of how ecotourism overcomes the challenges and contributes to the conditions for successful CBMM.

4.3 The contribution of ecotourism

In this chapter, the contribution of ecotourism to CBMM in Sri Lanka is discussed. First, some context is given on ecotourism in Sri Lanka including examples of ecotourism projects observed for this research. Then, the question is answered to what extent and how ecotourism contributes to the technical, political, social and economic conditions for successful CBMM formulated in chapter 4.

4.3.1 Context of ecotourism in Sri Lanka

In Sri Lanka, Tourism has traditionally been the third largest foreign exchange earner in the country and an important income generator. Sri Lanka’s tourism numbers peaked the year before the COVID-pandemic in 2018 at a recorded 2.5 million tourist arrivals. In 2023, the country welcomed circa 1,5 million tourists again from mainly India, Russia and Western Europe (Sri Lanka Tourism Development Authority, 2024). Tourists most often visit the western, southern and central provinces. Due to the high number of tourists in the country, many Sri Lankan people find their work in the tourism industry. Figure 8, retrieved from the World Tourism Organization (2023), shows the increasing number of total employees in Sri Lanka in the tourism industry. The dark red line indicates the reported total: 143.2 thousand. Tourism in Sri Lanka is therefore booming and an attractive industry to start up a business for the local citizens.

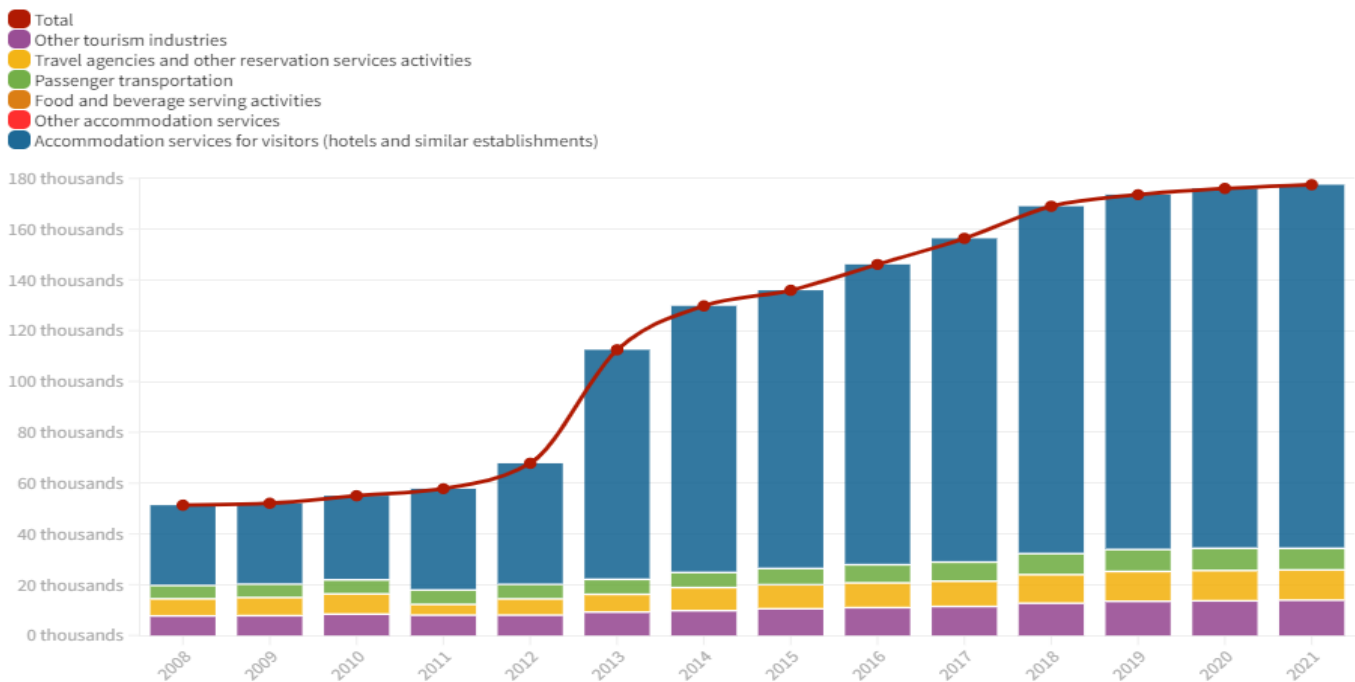


Figure 8: Total employees in Sri Lanka in the Tourism industry (UNWTO, 2023)

Sri Lanka is, due to its landscape, cultural aspects and high tourist arrivals, also a very potential country for ecotourism. Wickramasinghe (2013) describes Sri Lanka as “blessed with splendid and diverse forests, wildlife resources as well as a rich cultural heritage” and “a significant potential to be developed as an ecotourism destination” (p.17). Ratnayake (2007) also concludes on his research and previous studies, that Sri Lanka has a rich resource base (lagoons included) to explore its potential to attract ecotourism. It’s unique ecosystems, rich biodiversity, high number of cultural tourist attractions and wide-understanding of the English language make the country very attractive for nature tourism. However, Ratnayake (2007) also states that Sri Lanka as a country performs far below its potential.

In his study on the historical evolution of ecotourism policy in Sri Lanka, Pathmasiri (2017) mentions that until 2000, the government of Sri Lanka placed less attention upon ecotourism in the country and more focus on luxury tourism and beach holiday attractions in its policies. It was in the year 2003 when the Tourism Board of Sri Lanka set up their first national policy on ecotourism (NEP) .

The main objectives of the NEP of Sri Lanka (2003) are:

- a) To promote and facilitate the development of ecotourism sites, activities, and facilities in a manner that is consistent with the principles of ecotourism;
- b) To educate all stakeholders that are required to develop a successful industry in Sri Lanka;
- c) To expand the range of ecotourism products, services, and facilities available in Sri Lanka;
- d) To increase the number of Sri Lankans involved in ecotourism and facilitate the development of community-owned and managed ecotourism enterprises;
- e) To contribute to and influence a more sustainable form of tourism in Sri Lanka, through a diverse range of measures: incentives, education, guidelines, regulations; and marketing;
- f) To contribute to conservation of natural ecosystems.

Overall, it can be said that Sri Lanka has a significant potential to be developed as an ecotourism destination. Looking at the objectives of the NEP, ecotourism sounds as a very promising strategy as it promotes community-owned enterprises that contribute to conservation of natural ecosystems. Are these promises fulfilled nowadays in Sri Lanka? In the next subchapter, an outline is given of some examples of ecotourism in Sri Lanka nowadays.

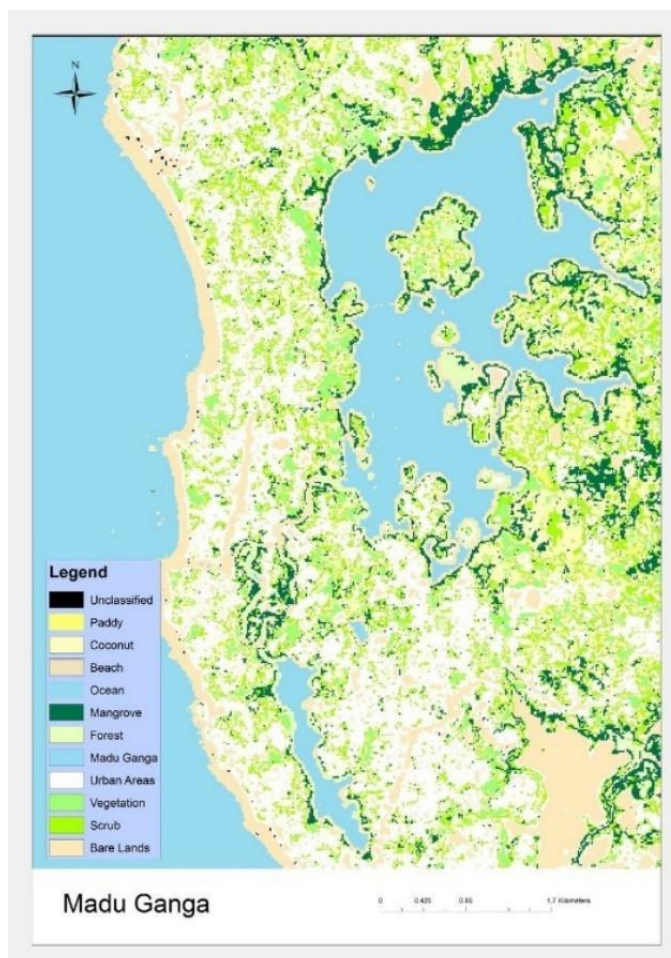
Ecotourism examples

Madu Ganga Estuary

The Madu Ganga lakes are located on the south-western coast of Sri Lanka and have a unique biodiversity, consisting of ten major vegetation types including the predominant mangroves and marshlands. This area is a special management area protected via the Ramsar Convention. The Ramsar Convention is the most extensive and global treaty for the protection of mangroves signed in Iran, 1971. This treaty provides the framework for national action and international cooperation for mangrove conservation. Madu Ganga estuary is the only mangrove area in Sri Lanka declared and protected under the provisions of the Ramsar convention, because it is located in the highly populated south western coast of Sri Lanka and under pressure from development and population expansion. Besides, according to research from Ranasasinghe (2012), Madu Ganga communities' awareness of mangrove forests and their benefits are at a lower level than that of other Sri Lankan communities.

Ecotourism

Madu Ganga area is famous among tourists for its boat tours on the lake where several islands are visited along the way. On the first island, tourists have the chance to experience 'fish therapy' for their feet, the second Island is called 'cinnamon Island'. Here, tourists can watch and learn how cinnamon is grown, dried and processed into cinnamon powder or oil. The last stop is at the



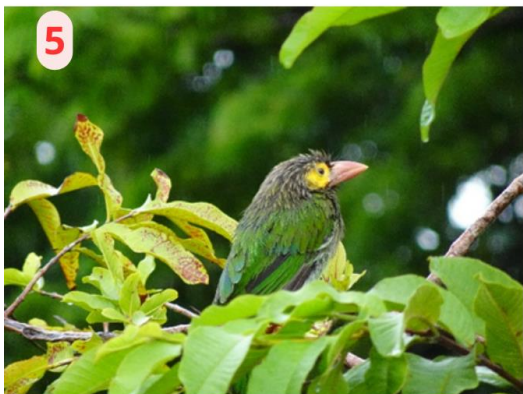
Map 3: Land Use Map of Madu Ganga (Gamage, 2017)

'Kothduwa Rajamaha Viharaya' temple. Since the boat tour operators are mainly focused on visiting the islands, less attention is drawn towards enjoying the mangrove environment, wildlife and bird watching. Therefore, it can be doubted for a lot of these boat tour operators if they can truly be defined as 'ecotourism'.

In the Madu Ganga area, boat tour operators can get a license via the forest department. This license system should prevent the carrying capacity of the lake exceeds. However, it can be doubted whether this license system successfully works, because there is a very high number of boat tour agencies operating at all times during the day.



*Image collage 1:
Observations Madu Ganga
View from the Lagoon
Fish Therapy
Cinnamon Island
Kothduwa Rajamaha
Viharaya' temple.
Bird watching
Mangrove tunnel for
boats*



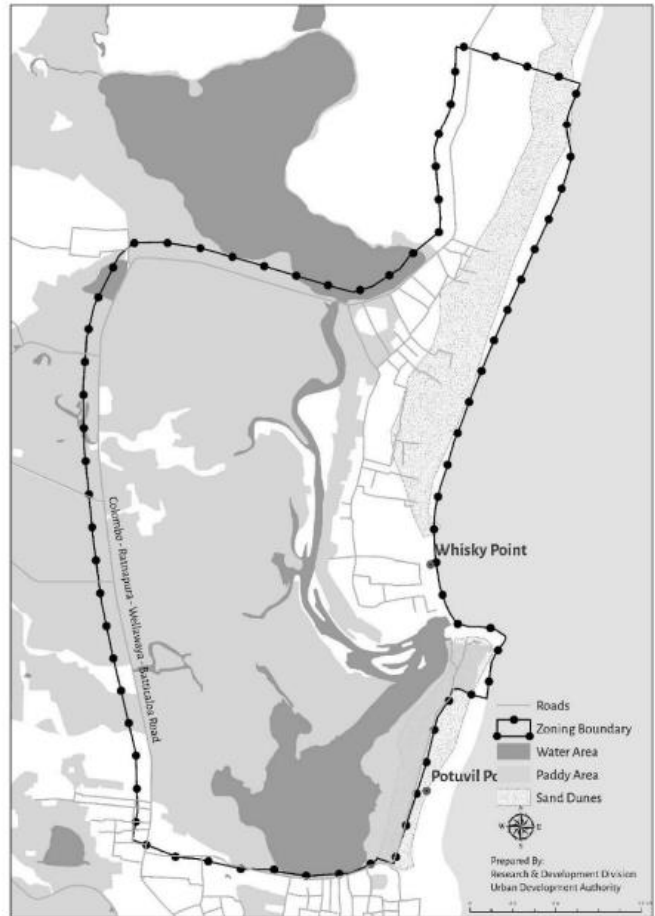
Pottuvil Lagoon

Pottuvil is a town, close to Arugam Bay located on the south east coast of Sri Lanka. The Kottukal area surrounding Pottuvil lagoon is a well-known tourist destination. Map 4 shows the high density tourism zone of Pottuvil and the 2 lagoons where ecotourism boat tours operate. Although the local fishing community obtains a wide range of benefits from these mangroves, they are under constant pressure from over-exploitation and clearing for other land uses. The 2004 Indian Ocean tsunami also caused severe damage to the mangroves and the wider environment in Kottukal and surrounding areas (Mangroves for the Future Secretariat, 2009).

Ecotourism

Around 2016, in Pottuvil, a community-based ecotourism project was implemented by the Coast Conservation Department and several NGOs in cooperation with local fishing communities. The main objective of the plan was to conserve and sustainably manage the lagoon ecosystem while empowering the local fishing societies and improving alternative livelihood to reduce the pressure on the lagoon. An ecotourism development plan was made, boats and life jackets were provided, technical training was given, ecotourism centers and floating jetties were built and the NGOs helped with promotion activities.

These fishing communities now manage the ecotourism project and give boat tours for tourists. They work via a rotation scheme to ensure the income is fairly distributed among the community members. They use paddle boats and welcome the tourists in their ecotourism centers. The project leaders speak very positively about the outcomes of the project. The pressure on the lagoon is reduced and due to the income generation, the socioeconomic status of the livelihood is increased.



Map 4: Pottuvil Lagoon and Urani Lagoon (Urban Development Authority Sri Lanka, 2020)



Image collage 2: Observations Pottuvil Lagoon
Ecotourism center with life jackets and posters
Paddle boats
Fishing community representatives Kottukal
Ecotourism Center Urani Lagoon.

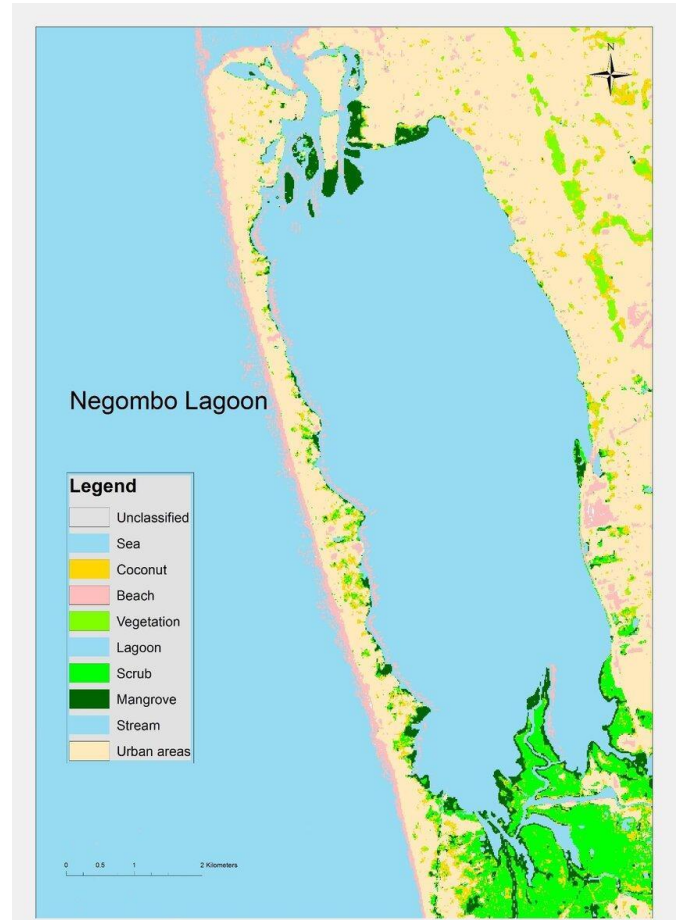
Negombo Lagoon

Negombo Lagoon is located about 35 km north from the capital Colombo and close to Bandaranayake Airport (Jayasiri & Haputhantri, z.d.). The lagoon has extensive mangrove swamps and attracts a wide variety of waterbirds. The estuary comes under the purview of the DFAR and the Negombo estuary Management Authority while the conservation forests are managed by the Forest Department.

The Negombo Lagoon and its coastal environment have had a long relationship with the fishery industry. It is linked to the sea by a narrow channel to the north near Negombo town. Most of the people in the area are engaged in lagoon fishing and the shrimp industry. Mangrove cover is declining rapidly owing to land clearing for large-scale shrimp aquaculture (Ranasinghe, 2012).

Ecotourism

Next to fishery, the lagoon is also used for ecotourism boat rides for tourists staying in Negombo or Colombo, as it is located next to the airport. Boat tour operators work individually and welcome tourists who want to see the mangroves, wildlife and do bird-watching. Some boat tour operators use petrol engine boats, others kayaking boats. Compared to the Madu Ganga area, the number of boat tour operators is relatively low, because the lagoon is also used by the fishery industry. Boat tours start from Negombo town or at Muthurajawela marshes, south of the lagoon.



Map 5: Land use map of Negombo Lagoon (Gamage, 2017)



Image collage 3:
Observations
Negombo Lagoon
Mutharajawela
Wetlands
Monitor lizard
Mangrove
trees
Fishing men in
the lagoon

On the whole, Sri Lanka is seen as a country with high potential for ecotourism in mangrove areas, due to its high number of tourist arrivals, rich mangrove biodiversity and cultural aspects. In a lot of regions, ecotourism has therefore already been implemented in different ways. In Pottuvil, a successful ecotourism project has been initiated by the government, giving fishery communities the chance to earn additional income and organize boat rides for tourists. In Madu Ganga, boat tour operators work independently and visit several cultural islands during the tour, which results in less focus on the 'eco' aspect of ecotourism. In this area, it can be doubted whether involving tourism in mangrove areas results in positive outcomes for the conservation of mangroves. In Negombo Lagoon, less boat tour agencies operate in the lagoon, because of the fishery industry. Boat tour operators work individually and offer tourists and locals boat rides that create awareness on the importance of mangroves. All three areas, ecotourism is implemented and functioning in a different way. Do all ways contribute to CBMM?

In the next chapters, an analysis is made of how ecotourism contributes to CBMM. This analysis is based on interview data, document data and observations made in Pottuvil Lagoon, Madu Ganga area and Negombo.

4.3.2 Technical contribution

First of all, an analysis is made for the contribution of ecotourism to the technical conditions that cause successful CBMM.

Mangrove conservation, ecological knowledge, monitoring and boundaries

In order for a CBMM project to be successful, habitat and diversity factors of mangroves should be taken into account and ecological dynamics maintained.

On the one hand, ecotourism does positively contribute to this condition, because the boat tour operators show and explain about the mangrove ecosystems, which creates awareness among the operators but also among the tourists about mangroves. Take, for example, the boat tours in Pottuvil, Negombo and Galle, where tourists are welcomed in an 'information center' with posters of all bird and animal species on the walls (Image 4).

Moreover, boat tours are also visited by researchers, photographers, bird watchers and students to learn more about mangrove ecosystems. Shanika and Lalith, both boat tour operators, tell their tours are often visited by students, nature photographers, researchers or government members.



Image 4: Information posters on animals living in the mangrove forests (River Viewer Boat tours, Negombo Lagoon).

Furthermore, ecotourism increases the value of mangroves for the boat tour operators, which in turn leads to better mangrove conservation. Mr. Sandaruwan, from NARA, explains: *“Highly vulnerable people with no opportunities are trying to get income from the surrounding environment. They will disrupt the environment and get what they can. For example, if you have mangrove land and you have no other livelihood opportunities, you will cut the mangrove land and sell firewood. If you have another alternative opportunity to give value to these mangrove lands, then they will be protected.”* Mr. Upali Rathnayake from Tourism Authority also talks about this value increase: *“You have to keep the mangrove environment untouched. Then what will happen? Each and every day, the mangrove tree will give you income in return during the tree lifetime. But if you cut the tree once, you get only once a benefit.”* Due to the value increase of mangroves, ecotourism participants are more willing to protect the mangrove trees. Also, there are high chances they feel a high responsibility towards the mangroves. Dr. Premathilake, deputy director of the coastal resource management unit, says it as following: *“Ecotourism is something special, because it gives an opportunity to people to earn a little bit more money. That feeling, that motivation comes, because they earn good income. That's the important thing. People think: ‘Okay, I have money because of this’. That is why we can use ecotourism as a tool.”* In practice, it also turns out to work like this. A boat tour operator in West Sri Lanka explains he is eager to protect the mangroves *“Because my daily bread depends on it”*.

On the other hand, ecotourism is also considered by the participants as a strategy that does not contribute to conserving mangroves at all. Due to a lack of monitoring and greenwashing, implementing ecotourism might increase pollution in mangrove ecosystems. The education officer from Mangrove Museum calls ecotourism *“A big problem for the mangroves, because the boats pollute the lagoon, disturb the ecosystem and threaten mangrove and fish species.”* She explains that they are against the promotion of ecotourism to conserve mangrove forests: *“most people are not aware about mangrove conservation, they always consider only the economic benefit, that's why.”* About this statement, Dr Manoj Prasanna, from the Biodiversity Secretariate, says: *“No actually, if it is ecotourism, there's no pollution, it is not large-scale tourism.”* He explains that *“Most hotel owners, large restaurants, don't care about mangrove conservation. They just visit the environmental authority and get the Environment Protection License from the authority. That means there's no proper inspection from the environmental authority.”* This shows that

due to a lack of monitoring, people with no intention to conserve mangroves are able to get a boat license and create pollution in the lagoon. Shanaka, boat tour operator in Negombo Lagoon, recognizes this:

“Most people drive the boat without a license, because nobody comes to see and check if you have it.” Mr. Sujeewa Jasinghe, Managing Director (CES), states that pollution due to ecotourism happens a lot in Sri Lanka if there is no monitoring. He explains that boat tour operators sell their boat tour as ‘eco-friendly’, but afterwards clean their petrol engines in mangrove lagoons and pollute the environment. Especially, because there is no one monitoring and controlling their behavior. Furthermore, he explains boat tour operators barely contribute to the conservation of mangrove environments. He mentions: *“If I’m a boatman, what my ego is, I will see a dollar sign from a tourist. And then my desire will be to get more and more dollars. For that, what should I do? Show them, in a small focus area, some nice environment and birds and bring them back as fast as possible and save my energy.”* Therefore, it can be concluded that ecotourism does not always contribute to conserving mangroves at all. This ‘money making’ attitude can be identified among boat tour operators in Madu Ganga, where some boat tour operators try to visit the three different islands as fast as possible, neglect the bird-watching and mangrove sightseeing and get back to pick up a new group of tourists.

This problem, where boat tour operators act in their self-interest, eventually leads to overuse and depletion of the mangrove resource: the tragedy of the commons. To prevent a tragedy of the commons, clear user and resource boundaries are needed according to the conceptual model (Ostrom, 2008). Mr. Sandaruwan from NARA, describes why clear user boundaries are needed: *“If we are implementing some kind of ecotourism based activities, then all the people of the village maybe jump into that boat, because it’s a very profitable industry.”* He therefore recommends setting up a community organization. Through this community organization, village leaders, key informants and all the people who have power can decide how many people are allowed to do the businesses. Mr. Upali Rathnayake from the Tourism Authority also experiences tragedy of the commons when implementing ecotourism programs and mentions: *“If you don’t have a proper management system, tourism will destroy the resource base.”*

A tragedy of the commons is also recognized in the Madu Ganga area, where a relatively high number of boat tour agencies individually operate in their own interest, without a proper working monitor system. Mr. Upali Rathnayake says they recently introduced a license system via a timetable that ensures the carrying capacity is not exceeded. However, it can be doubted whether the monitoring of this system is done properly, since no boat tour operator from Madu Ganga told about this system in the interviews and representatives of the NGO EMACE say there are still so many boats, *“that it’s very harmful during the day time and noisy for the birds and other species”*. To ensure good monitoring, Mr. Upali Rathnayake explains it is important that *“the community itself should understand: ‘if we protect, so we will get the income’”*. He explains it is hard in Sri Lanka to let a neighboring government organization be a supervising or monitoring body, because political hands do not always follow the guidelines.

In Pottuvil Lagoon, the fishermen also work via such a rotation scheme. The representative of the fishery community explains: *“So they have a number for each person. If the fifth person is going to do the tours today, he will not do the tours tomorrow.”* The number system is well monitored by the community representatives and gives every member a fair chance to do a boat tour. There are also clear user boundaries, because only the fishermen are allowed to operate the tours. Another success factor of the Pottuvil Lagoon is that the monitoring body has high mangrove friendly values. In the first place, they want to protect the mangroves and in the second place, they want to earn additional income and organize boat rides. If intrinsic values are right and mangrove ecological knowledge is high, the carrying capacity of the lagoon will not be exceeded. For example, Mr. Sajeewa, a man with a passion for conserving mangroves and project director at the Nagenhahiru Information Center, deals with this problem by changing his price for a boat ride: *“If I invite more tourists to this center per day, my income is increasing. Then what will happen? The carrying capacity will be exceeded. Therefore, we have high rates and a maximum numbers of tourists per day.”* Due to his intrinsic values, the carrying capacity of the lake will not be exceeded. To create these right intrinsic values, education and awareness programs are needed to learn community members about the value of mangroves.

Overall, it can be concluded that ecotourism, on the one hand, might cause better mangrove conservation due to a value increase of the mangrove forest. Ecotourism also serves as a way to let researchers, students and tourists environmentally friendly visit the mangroves sites and learn about its ecological aspects. On the other hand, causes ecotourism higher chances of pollution and a tragedy of the commons if the boat tour operators individually act in their own self-interest. If the project leader does not have the right intrinsic intentions, a proper working monitoring system and license management have to be implemented to prevent pollution. Given the fact that local governments often cause political interference and national government bodies already struggle due to a lack of staff members, funding and technical knowledge, it can be doubted whether this monitoring body should be in hands of the government. It is, therefore, recommended to set up a community organization and let the community members, via awareness programs, understand that the mangroves are of high value. This community organization can eventually hand out licenses and control a timetable system to ensure the carrying capacity of the lagoon is not exceeded.

Technical support

Another condition for successful CBMM is technical support from NGOs or the government. Does ecotourism contribute to this in a positive way? Looking at the projects and interviews, it can be concluded that implementing an ecotourism project asks for even more technical support than other CBMM projects. Participants answer that, next to creating mangrove awareness via training, project leaders now also have to provide training in entrepreneurship for the community participants. Mr. Premathilake, deputy director of the coastal resource management unit, explains: *“Just having training programs and just showing things, that is not enough. Once we select people, they are not entrepreneurs. We have to convert these people into entrepreneurs. We have to work with them, because community people are initially reluctant to change. If you say: ‘you will run a boat ecotourism business’. They see a lot of difficulties: ‘I have no money and no time.’ ‘It’s only seasonal...’ But if you change them into entrepreneurs, they see it as a challenge.”* In the case of Pottuvil Lagoon, entrepreneurship support is also needed for the fishing community members. The representatives of the fishing community mention *“We are the fishermen. We don’t know how to promote our business.”* Therefore, an NGO came to support them by making videos, building a website and uploading pictures on Google. The fishermen in Pottuvil highlighted the high importance of technical support from NGOs and Government bodies and even mentioned it as a key factor to their success. Mr. Faizarsulfi, a community-based tourism project leader in Pottuvil, says: *“The people don’t always understand what tourism is.”* Next to entrepreneurship skills, he explains they also needed to change the attitude of some community people towards tourists. *“People can see white skin. They might feel you have a lot of money. They don’t think about different currency rates.”* To change this attitude, even more extra training was needed. Mr. Upali Rathnayake (Tourism Authority), worked on different ecotourism projects and says he ended up with different training programs. One about *“what is good tourism?”*, one about financial stability *“how to save money?”* and one about the mechanical part of doing boat tours. He ends this topic with *“And of course, whatever you train, it is only a certain percentage that will become a success. That is some sort of a common factor when you work with the community.”*

Overall, implementing ecotourism projects asks for even more technical training than implementing CBMM projects, since community members have to be converted into tourism friendly entrepreneurs. As already described in the previous chapter, government bodies of Sri Lanka currently struggle to guarantee sufficient technical training, due to a lack of staff members, funding and technical knowledge among staff members. Therefore, help from other institutes like NGO’s is needed to provide enough technical support in implementing a well-working ecotourism project to positively contribute to CBMM. If this support cannot be offered, it can be doubted whether implementing ecotourism will end up to be a success, because the community members might lack in their entrepreneurship skills.

4.3.3 Political contribution

In this subchapter, an analysis is made of the contribution of ecotourism to the political conditions for successful CBMM.

The political conditions as mentioned in the previous chapter are 1) strategic collaboration; 2) a management plan; 3) a mechanism for conflict resolution; 4) capable leaders and 5) support from all levels of the government. As concluded from the previous chapters, support for a CBMM project cannot always be found on every government level in Sri Lanka. Local authorities and district secretaries tend to negatively interfere with a project, due to a lack of environmental awareness and a desire to gain votes. Does ecotourism contribute to this?

While analyzing the interviews and observations, it can be concluded that the contribution of ecotourism as a strategy does not have a mentionable positive influence on all conditions mentioned above. To start off with the contribution on strategic collaboration. Strategic collaboration is still hard, because implementing an ecotourism project involves even more actors than CBMM projects. Not only are mangrove conservation parties involved, tourism-related actors also take a seat in the decision-making processes now. Mr. Sajeewa, project director at the Nagenahiru center, says: *“When you want to develop ecotourism, you have to get approval from all these relevant authorities. That is a challenge. It takes more time to do.”* He also mentions management plans on ecotourism are missing: *“I can’t see the master plan for it. All these relevant authorities, come up with the master plan! Then we can get approval and implement it.”* Mr. Sujeewa Jasinghe, Managing Director (CES), also talks about the absence of integrated management plans: *“What is lacking is integrated management plans and executed plans. Yes, sometimes we have a certain very good action plan. The management plan is there, but that does not have the executing mechanism. So always the engagement is limited and the stakeholders are doing what they want in a different way. This exact system does not allow ecotourism to be a tool.”* He describes that institutions should develop a mechanism, in which all responsibilities are clear and different people have a different role: *“University is doing the academics and guiding them. And the tour operators, as local communities, are a livelihood.”*

Looking at the next condition: ‘A mechanism for conflict resolution’, ecotourism might contribute in some ways. Since the benefits of ecotourism can be equally divided among the community members, conflict hardly arises. Equal division of the benefits could be done via the earlier mentioned rotation scheme. Mr. Sandaruwan, researcher at NARA, mentioned they used it in their projects: *“When all the people want to get involved, because they want to get income. Then, we discuss and we arrange it like: today, we visit one family, next day, next family. And we ensure that income is divided.”* Also, if there occurs to be a conflict situation, punishments can be given by prohibiting the community member from giving any more boat rides, thereby excluding the person from the benefits. Nevertheless, having a good mechanism for conflict resolution comes hand in hand with clear responsibility tasks among the participants and a well-functioning monitoring body. These important aspects are as difficult in ecotourism projects as in CBMM projects, making ecotourism not the one-way solution.

Looking at the last condition ‘support from all levels of the government’, ecotourism can be doubted to get any more support from government bodies than CBMM projects. Many boat tour operators in the interviews respond they don’t receive any support from the government. Lalith, boat tour operator in Madu Ganga says: *“No government ever helped us. They only collected the tax.”* It might be that boat tour agencies earn such high income from the boat tours, that governments do not see any reason to give any more support. Thereby comes that boat tour operators who experienced low government support, were less focused on mangrove conservation than boat tour agencies who did experience enough government support. It seems that government bodies only give support when a boat tour operator is in need of money and practices true, environmentally friendly ecotourism.

However, not all levels of the government bodies hand out support. Since ecotourism involves business opportunities and high income generation, it causes even higher tensions and more political interference in projects, because it increases the feeling of greediness among political stakeholders. Ratnayake (2007) concludes in his paper on ecotourism development in Sri Lanka that political influence is one of the major political challenges in implementing ecotourism projects.

Dr Manoj Prasanna, from the Biodiversity Secretariate, says he wanted to implement an ecotourism project, already trained 30 people, collected funds and planned to build an information center, but the district secretary of the area stopped his plans abruptly. The district secretary had stopped this project due to the sudden fission taken by the government due to the financial crisis in the country to regulate treasury funds.

According to the interview participants, these kinds of situations with political interference happen a lot in Sri Lanka. Ecotourism initiatives are not making a difference in this and do, therefore, not positively contribute to this condition of successful CBMM.

Overall, it can be concluded that ecotourism does not have a mentionable positive influence on all political conditions that cause CBMM. It creates the same, maybe even higher, strategic collaboration issues, due to the high number of actors involved in the decision-making processes. For ecotourism, also no proper management plans exist with enough executing mechanisms. Conflicts within ecotourism projects are still difficult to resolve as well, since there are not always clear responsibility tasks and a monitoring body present. Furthermore, due to the money-making and business opportunity attribute of ecotourism, political interference might be even increased and government support is not on every level given to the boat tour agencies.

4.3.4 Social contribution

This subchapter discusses the contribution of ecotourism to the social conditions for successful CBMM.

Committed community participation

One of the social conditions is committed community participation. In short, NGOs and governments in Sri Lanka often experience difficulties in convincing local communities to actively participate in their CBMM projects, because the community does not see its own benefit in the matter.

About the contribution of ecotourism to community participation, participants speak rather positively. Mr. Upali Rathnayake, from the Tourism Authority, says: *“almost all communities we are working with, are really helping us.”* He explains almost all communities want to participate in the ecotourism projects, because of the economic benefits. As project leaders of ecotourism not only conserve mangroves, but also support livelihoods, it is a chance for the local communities to earn an additional income. In Pottuvil, for example, fishermen got the chance to earn an extra Rs200,000 per season. For them, the choice was easily made. However, not only economic reasons got them to participate in the project. Due to the awareness programs, they also learned that mangrove conservation is good for their environment and fish catch. Therefore, they wanted to genuinely conserve the mangroves and start showing the beauty of the environment to tourists. Representatives of the fishing community explain: *“Because all people love the foreigners, the tourists, they like to show the people our village, the trees, the lagoon...All fishermen are then very happy.”*

Therefore, participants are also motivated to join an ecotourism project, because they love to work within the tourism sector and it is an opportunity to meet people from all over the world. In almost all interviews with boat tour operators, this inner affection came to light. For some even the reason to start their ecotourism business in the first place: *“Why did I start? Because I really like the tourism industry, welcoming foreigners and hospitality. It gives me a very good feeling.”* tells Shanika enthusiastically, boat tour operator in Negombo Lagoon. Dr. Premathilake (CCD) describes: *“Yes, ecotourism as a tool we can use, because they get an opportunity to earn money and the opportunity to make relationships with foreigners. In some areas, they even marry the local girls. There’s a lot of relationship building. They like that.”* Through ecotourism, committed community participation can therefore be increased. Besides that, continued participation might also be increased, because when participants decide to invest and set up a boat tour business, it is not likely they will suddenly stop, because of the high investments already made.

However, ecotourism is also a strategy that takes patience and high commitment from the community participants, because most benefits are only visible in the long term. This aspect sometimes negatively influences the amount of continued, committed participation.

Mr. Sandaruwan (NARA) explains: *“Good benefits return after several years or generations. Participants do not think about indirect benefits like: ‘my environment is protected, my fish catch is increased and nature will look beautiful’. No, they want to get the money straight away.”* For these reasons, Ratnayake (2007) also concludes that limited participation is a challenge when implementing ecotourism projects in Sri Lanka. Another reason for limited participation is the cultural barrier people experience between them and the tourists. In some areas of Sri Lanka, tourists primarily come for the 4’S (Sun, Sea, Sand and Sex). These kinds of tourists cause intrusion and cultural disruption in some areas (Ratnayake, 2007). Mr. Faizarsulfi, a community-based tourism project leader in Pottuvil, explains that, especially women, don’t like to work in the tourism sector for these reasons: *“They don’t like to work with people who drink or are addicted to the drugs and are scared their traditions are not respected.”* He also tells some women suffered from sexual harassment and are, therefore, not willing to participate in tourism projects. To overcome this, he tells you should carefully take the social/cultural context in mind of a project area and do some try-outs, before involving them in an ecotourism business. Representatives of the NGO EMACE, also used this ‘try-out’ technique and introduced a tourist to a rural village community. *“She got to live with the community. By living there, she got familiar with the villagers, visiting people, eating from their restaurants, coming to their farmland and talking to them and so on. She was accepted by the community. So then, every time we had to explain ecotourism, we take this as a classic example and local people understand.”* Another cultural barrier that is mentioned by the interview participants is the lack of mastering of the English language among community members. As the community members do not always speak fluent English, it is hard to organize proper, educational boat tours for the tourists. The fishing communities in Pottuvil found a solution for this: *“Since it’s a rural, small village here, many people really struggle with their English speaking skills. So that’s why, when we drive the boats, two people have to be there. One has a really good inside of the mangroves, but he can’t speak English. But the other guy, he can speak English. So they complement each other. They manage to respond to the tourists.”* Overall, ecotourism positively contributes to committed community participation, because participants are overall well-willing to join the projects in Sri Lanka. The projects are attractive for community members to join, because of the additional income, the opportunity to build social relationships and the passion to show tourists their country. On the other hand, ecotourism projects are not attractive for all community members, because the tourism-industry is not loved by all cultural groups within Sri Lanka. The participation grade may also stay low, because the benefits of ecotourism are long-term and it takes high time and money investments to start.

Community benefits

When implementing ecotourism, it should also be carefully monitored who is getting all the benefits. In successful CBMM, the community or group that lives within the resource is the same as the group that makes the decisions over the resource and the same as the group that benefits (Bond et al., 2006) (Ostrom, 2008). In the interviews, it came to light that ecotourism in Sri Lanka is sometimes not truly creating community benefits, but leaves a part of the community behind. Mr. Sajeewa, from the Nagenahiru Center, says: *“They try to market it as community-based ecotourism, but when you carefully look it is not community based. No, they hired people for jobs, but they try to show it as a community... When you come to the entrepreneur, he’s thinking about his income to his account.”* It overlaps with the problem of the tragedy of the commons, already discussed in the previous chapter. To prevent the tragedy of the commons, it was recommended to set up a community organization that works via a license system and rotation scheme. There should also be a strong monitoring body. The problem that, within ecotourism, benefits are not equally divided among community members can be solved by creating a strong community organization. Mr. Upali Rathnayake, from the Tourism Authority, describes: *“without a strong community association, every individual will come and try to capture all the economic benefits. A management method is needed to prevent this.”* Mr. Sajeewa, from the Nagenahiru Center, approached it a little differently and said an NGO should hold responsibility for the income generation: *“Different from the entrepreneur, we always think about the community.”* He mentions that with the incomes from the boat tour, infrastructure, education and other facilities for the community members can be provided instead of money. In this way, ecotourism still provides benefits for the whole livelihood. In chapter 4.3.5 about economic contribution, further ideas of how ecotourism might contribute to the welfare of the whole livelihood will be discussed.

Support of the neighborhood

Another social condition for successful CBMM is support of the neighborhood. As already discussed, a lot of people in Sri Lanka tend to have a greedy and jealous attitude towards people “climbing up the ladder” due to the unstable political and economic crisis in the country.

Looking at the contribution of ecotourism, it can be said that ecotourism does not solve this problem. Moreover, it creates even more social tension, because ecotourism involves higher economic benefits. Mr. Faizarsulfi, a community-based tourism project leader, describes his experiences with the neighborhood: *“A lot of problems I faced myself, because hoteliers don't like to give away their business. I brought this proposal and then it was rejected, because hoteliers might feel they can lose their business, because you are the opponent.”* Mr. Janaka, owner of a boat tour agency, experienced the same resistance from neighboring hoteliers: *“I felt like they were ignoring me, because I own a boat tour company. It doesn't mean their business was reducing. On the contrary, I am trying to get more business to this place. They didn't realize that part.”*

Shanaka, owner of River Viewer Boat Tours, also explains he experiences a lot of resistance from his neighborhood: *“I'm sad about it. For any reason they call the police and they blame me. They have no reason, but they don't like when someone is getting up.”* The rejection from his neighborhood makes it hard for him to run the boat tour business. Dr Manoj Prasanna, from the Biodiversity Secretariate, recognizes the problem and comes up with his solution: *“We have to make an awareness program and give the community a good idea about tourism and what kind of benefits they can get. Without proper organization, that kind of issue is there.”* An important factor in gaining support from the neighborhood is also the feeling of trust they have towards the boat tour operator, just like in CBMM projects. This also occurs in the case of a boat tour operator in West Sri Lanka, he experiences good support from his neighborhood and the community members even voluntarily participate in his mangrove conservation projects. Mr. Janaka, owner of a boat tour agency, also mentions the importance of gaining trust from the community members. You, as a project leader need to show you have good intentions for their welfare and environment. *“It took me two, three years. Previously they didn't even trust me at all. Now, they are communicating with me.”*

Overall, it can be concluded that ecotourism very often negatively contributes to the support of the neighborhood in Sri Lanka, because it creates even more social tensions among the community members. A way to overcome this challenge might be to implement an awareness program, where all community participants learn about the benefits of ecotourism for the whole livelihood. Also, it is very important to gain trust from the community, by showing the boat tour operator has good intentions for their welfare and environment.

4.3.5 Economic contribution

In this subchapter, an analysis is made of the contribution of ecotourism to the economic conditions for CBMM.

Within CBMM in Sri Lanka, a lack of financial sustainability is a major challenge in sustaining the project. Ecotourism might help overcome this problem, because it is an opportunity to generate additional or alternative income for mangrove stakeholders. Through ecotourism, a sustainable, independent generation system is developed. This system is capable of generating continuous economic benefits to the community through high tourism demand and interest in nature (Ratnayake, 2012). Mr. Upali Rathnayake, from the Tourism Authority, explains the mechanism in his interview: *“If a fisherman takes the tourists at least one trip per a day and 20 days per a month, and each boat has five to six guests. How much of an income can he earn? And over a period of his lifetime, maybe about 30 years of the active lifetime, how much money can you earn? And if you cut the tree for firewood, you get one day or two day benefit maximum. Then ask from the community, do you want \$1? Or do you want \$30? If you want \$1 value, cut the tree and burn it. If you want \$30 or maybe more, protect the tree and do the ecotourism with the mangrove.”*

Due to the additional income, community participants are less dependent on external funds. Mr. Sajeewa, project director at the Nagenahiru Center, explains: *“As an organization, we can't always depend on the funding by donors. We want to make some income generation activities to get our own funds and utilize that fund for our activities. Yes, that's why we are also promoting ecotourism.”*

Therefore, ecotourism contributes to CBMM, because it provides additional incomes that cause a

project to be independent from external funds.

Besides, ecotourism also creates business and job opportunities for the whole livelihood. Since a boat tour agency attracts tourists to a certain area, it also creates a market for, for example, tourist shops, restaurants or guesthouses. Moreover, there are also a number of boat tours that visit, during their tour, local entrepreneurs like wood handicraft makers, painters, cinnamon growers and restaurants. For example in the case of Madu Ganga. Tourists get the chance to enjoy the cinnamon tea on Cinnamon Island and buy products directly from the product maker if they want to. The boat tours from the Nagenahiru Information Center are tours that visits local handicraft artists. Project director Mr. Sajeewa, explains: *“Normally, the craftsman is going to sell his product for a low price to the tourist shop and the tourist shop is selling it for a higher to the tourist. Now, we can sell it directly to the tourist. That means there's a profit for both parties.”* Mr. Janaka, from boat tour agency Eco Escape, also visits a local craftsman in his boat tour: *“He will plant some mangrove trees himself and in return I visit him with the boat tour.”* The craftsman he mentions is also interviewed. He was very happy to have the opportunity to sell his items directly to the tourists instead of the tourist shops. With this collaboration, he got the chance to earn some extra income and also show his impressive wood carving skills to the tourists. Therefore, it can be concluded that ecotourism positively contributes to the welfare of the livelihood by creating new business opportunities.

However, ecotourism also has its economic challenges. Generation of income is not always high enough to cover daily-life costs and can better be seen as additional income. Especially, when doing boat tours, because they can only be done in the early morning or evenings at good bird watching time. For Mr. Janaka, from boat tour agency Eco Escape, this is the reason why he additionally wants to start a guesthouse to earn income. For the fishing communities in Pottuvil, however, this does not seem to be a problem, because it perfectly supplements their fishing activities. At night and day time, they fish, in the early mornings and evenings, they do boat tours.

Furthermore, Mr. Manoj, from the Environmental Authority, mentions that even though ecotourism generates income, there are still limited financial benefits and a lack of continuous funds. *“That kind of funds we can't find in the country”*. However, some participants argue that not only funds are needed to successfully sustain a project, community participants are in need of facilities, like boats, centers, life jackets, but most importantly: training programs. Representatives from the NGO EMACE have experience in this and explain it with an example of helping a fishermen: *“I give a boat to you and a fishing net. Next day, you're going to sell the fishing net and the fishing boat. After that, what happened? Nothing, zero. Therefore, I need to give skill to you. Like more skill, how to catch more fish with modern equipment. Until he dies he has that knowledge he can use. We don't want to give fish to them. We teach them how to catch fish.”* Therefore, a lack of financial funding does not have to be a problem for ecotourism, because boat tour agencies are not in need of money, but in need of knowledge.

A major reason why there are still limited financial benefits for boat tour operators, is because they struggle with the marketing of their products and lack entrepreneurship skills. Mr. Sandaruwan, researcher NARA, describes: *“The market linkage is the main problem, especially in how to attract the tourists. Small businesses are starting, but they don't know how to sell this to other consumers. Or how to build a website.”* Shanika, a boat tour operator in Negombo Lagoon, is an example. He says that he is in need of that knowledge: *“How can I promote?”* As already mentioned in the chapter on 'technical support', this is a reason why a lot of ecotourism projects want help from NGOs or government bodies in promoting their business. Therefore, they are not necessarily in need of money, but in need of knowledge to create generation of income.

Due to the lack of marketing skills, some boat tour agency's work together with large tour companies that send the tourists. However, Mr. Sajeewa, project director at the Nagenahiru Center, tells: *“They are charging a very large amount of money from the tourists and they are paying a very small amount to us.”* Working together with such tour companies is, therefore, not financially beneficial. *“They market it as a sustainable project and they make the income from that, but when you come to the insight of the story... How much are they paying us? With that amount of money we cannot run the project in a sustainable manner.”* In order to avoid such situations, it is important for ecotourism boat tour agencies to gain more marketing and entrepreneurship skills by training programs provided by NGOs or government bodies.

In summary, it can be concluded that ecotourism is a promising strategy to generate additional or alternative income for mangrove stakeholders. Ecotourism can also positively contribute to the welfare of the livelihood by creating new business opportunities and involving local artists or restaurants in the boat tour. However, ecotourism also knows its economic challenges, because there are still limited financial benefits due to a lack of entrepreneur and marketing skills among the boat tour operators. Technical support is needed, but as already discussed in the previous chapters, it is not always possible to get this support due to the current economic and political crisis in the country.

4.3.6 Conclusion contribution of ecotourism

In this chapter, the contribution of ecotourism to the conditions of successful CBMM has been examined. On the one hand, ecotourism positively contributes to the successfulness of CBMM. First of all, because, in some cases, it leads to better mangrove conservation due to a value increase of the mangrove forest. Besides that, ecotourism can also be a good strategy to increase the commitment and participation grade of a project, because people are more willing to participate due to the additional income and opportunity to build social relationships in the tourism sector. Ecotourism also positively contributes to CBMM, as it is a strategy which generates income and increases the welfare of the livelihood by creating new business opportunities for community members.

On the other hand, ecotourism negatively contributes to the success of CBMM. To start off with the higher chances of pollution and the need for even more technical training given by NGOs or government bodies due to a lack of entrepreneurial skills. Besides that, it can be concluded that ecotourism does not have a positive influence on all political issues regarding CBMM. Moreover, it creates even more problems in responsibility questions due to an increase in the number of actors involved and the money-making attribute of ecotourism. When looking at the social context, there are high chances economic benefits are not fairly distributed among the community if it is not carefully monitored. Additionally, ecotourism often causes a lot of resistance from the neighborhood, due to feelings of jealousy. Finally, ecotourism offers a way to generate income, but also knows its economic challenges, because there are still limited financial benefits due to a lack of entrepreneur and marketing skills among the boat tour operators. Funding is therefore still needed sometimes, but cannot be provided by the government bodies due to the economic crisis.

Therefore, ecotourism is in need of a proper working monitoring system, broad educational programs and a community association that controls the licenses and fairly distributes the incomes. Given the fact that government bodies already struggle due to a lack of staff members, funding and technical knowledge, it can be doubted whether ecotourism should be recommended as a strategy to successfully contribute to CBMM.

5.0 Conclusion and recommendations

In this research, it is examined to what extent and how ecotourism contributes to the technical, political, social and economic conditions for successful CBMM. This chapter answers all research questions and concludes with recommendations for government stakeholders, boat tour operators and further research. Finally, a reflection is given on the theory and methodological choices.

5.1 What conditions determine successful CBMM?

Looking at the results, it can be concluded that there are several key conditions for successful CBMM in Sri Lanka. Almost all conditions formulated in the conceptual model were relevant, but some are heavily interrelated and more important than others. These conditions will be discussed first.

In Sri Lanka, the first reason why many projects fail is because of a lack of ecological knowledge on mangrove restoration. This often causes harm to the mangrove environment and degradation of planted mangrove trees. Therefore, there should be sufficient technical support from NGOs and government bodies organizing regular training programs to provide this knowledge. Training also creates an ownership and sensitized feeling towards the mangrove sites which increases the number and commitment of participants.

Another reason why CBMM projects tend to fail is a lack of monitoring, which causes pollution in the mangrove lagoon. Therefore, an important condition for successful CBMM is to have one party that monitors the project on its environmental aspects. For this, the question arises who is responsible for that task. Who is responsible for leading the project (after the government/NGO support stops)? Who checks whether the rules are being met? And if someone breaks the rules, who will hand out what kind of punishments? The answer to these questions should be made clear before implementing a CBMM project and documented in a management plan. However, in Sri Lanka, dividing these responsibilities is a challenge, because of the complex political system and power inequalities. Also, support for a CBMM project cannot always be found on every government level in Sri Lanka. In some cases, local authorities and district secretaries tend to negatively interfere with a project, due to a lack of environmental awareness and a desire to gain votes. To overcome this challenge, an approach should be used that takes the contextual social-political structure into account carefully.

Another condition for successful CBMM is financial sustainability of the project in the long-term. Especially when there is a lack of funding from external organizations, project holders should utilize their incomes and become economically independent. This can, for example, be done by providing ecotourism activities.

The third important condition for a successful CBMM project is to actively let community members participate in the project. In short, NGOs and governments in Sri Lanka often experience difficulties in convincing local communities to actively participate in their CBMM projects, because the community does not see its own benefit in the matter. Therefore, project leaders try to create a community benefit via investments in the livelihood or providing loans. However, providing loans is risky, because people might join only to earn easy money. To prevent this, it is important to create environmental awareness among the participants. It is recommended to select community members and work together in community partnerships. Especially with fishery organizations, because they have direct benefits from mangrove conservation, since the fish catch will increase.

The last condition for successful CBMM is to gain trust from the local society before you start a project to prevent jealousy in the neighborhood. Due to the unstable political and economic crisis in Sri Lanka, inhabitants overall tend to have a jealous attitude towards people "climbing up the ladder". Therefore, it is important for project leaders to carefully take the social-cultural context into account.

The key conditions mentioned above lead to successful CBMM projects. There are also conditions mentioned in the conceptual model that are considered to be less important in the case of Sri Lanka. According to the conceptual model, it is important to let the community independently make decisions on mangrove management. In Sri Lanka, this is impossible due to the administrative system. However, since Sri Lankan communities do not always possess a sufficient budget, knowledge and capable leaders, it can be doubted whether this forms a big problem within the successfulness of CBMM

projects. Especially, if the intentions of the decision-making parties are to support the communities. Another condition that was hardly mentioned by the interview participants is having clear resource boundaries. The reason for the absence of this condition is not hundred percent clear. It might be that the clear definition of boundaries only becomes important for the participants if the rest of all the challenges (f.e. lack of ecological knowledge, financial stability and clear responsibility tasks) are already solved.

Knowing all the conditions that cause successful CBMM, it is time to examine the role of ecotourism.

5.2 To what extent and how does ecotourism contribute to the realization of these conditions?

To answer this question, first the positive contribution of ecotourism on CBMM is discussed. Ecotourism is, first of all, a strategy with a unique potential to create a high value increase of the mangrove forests to community members. Since the community members depend on the mangrove forest for their additional income, their responsibility towards the mangroves increases and they will be more willing to protect the mangrove trees. It also contributes to the existing ecological knowledge of mangroves, because ecotourism serves as a way to let researchers, students, locals and students visit the mangroves and learn about its ecological aspects. Due to the opportunity to generate additional incomes, ecotourism can also positively contribute to the welfare of the livelihood. Ecotourism in a neighborhood can create new business opportunities and offer local entrepreneurs and handcraft artists a chance to directly sell their products to the tourists. Looking at the social contribution of ecotourism, the strategy also causes high participation numbers within the community, because projects are attractive for community members to join. Mainly, because of the additional income, but also because community members like to work in the tourism sector and have the opportunity to build social relationships with foreigners. For all these reasons, ecotourism contributes to community based mangrove management and can be implemented as a tool to conserve mangroves.

However, all these positive contributions of ecotourism only occur when several conditions are taken into account. If ecotourism is not properly monitored, managed and carried out by people with wrong intentions, high chances exist the boat tours cause pollution in the lagoon and the carrying capacity of the mangrove resource will be exceeded. To avoid such a tragedy of the commons, a proper working monitoring system and license management have to be implemented. Also, training programs are needed to inform the participants of the importance of mangrove conservation. These training programs should, in the case of ecotourism, not only consist of mangrove awareness, but also entrepreneurship skills and guidance in how to work with tourists. When community participants are not converted into entrepreneurs, there are high chances the ecotourism business will not run in the long term. Furthermore, it is highly important that, before implementing a project, a careful look is taken into the cultural and political context of an area to understand the attitude of the community members. Not every area is suitable for an ecotourism project. Ecotourism projects are not attractive for all community people, because some cultural groups do not prefer to work (together) in the tourism industry. Political interference might occur when the political context is not sufficiently taken into account. Therefore, it is also important to gain trust from the community and show, as an ecotourism project leader, you have good intentions for the community and its welfare and environment.

Although ecotourism has much good to offer, some conditions mentioned above are not always possible to realize. This, eventually, makes ecotourism negatively contribute to CBMM. Since community members have to be educated on mangrove conservation, entrepreneurship and how to work with tourists, regular, intensive training programs are needed in order for ecotourism to successfully contribute to CBMM. However, these training programs have to be provided by NGOs or government bodies. In Sri Lanka, both institutions struggle due to a lack of funding, staff members and technical knowledge among the staff members. The same problem occurs when trying to avoid a tragedy of the commons. For this, a proper working monitoring system and license management have to be implemented. Such monitoring systems and proper working license management rarely exist in Sri Lanka, because the country has a complex political system regarding mangrove management. A

multitude of policies and laws sometimes brings confusion into the management of the area. The question arises who should be responsible. National government bodies struggle again due to a lack of staff members, funding and technical knowledge among the staff members. Local authorities and district secretaries tend to monitor and manage the situation incorrectly, due to a lack of environmental awareness and a desire to gain votes. If not implemented correctly, ecotourism will almost certainly create higher pollution of the mangrove lagoon. Therefore, project initiative holders should always carefully take into consideration whether ecotourism should be implemented if they do not have sufficient facilities and staff members to guide the process successfully.

The good news is, although it seems so complicated, there are cases known in and outside Sri Lanka where ecotourism successfully functions as a tool in community-based mangrove management. It is not impossible to create an environment in which mangroves are conserved, environmental awareness is created and ecotourism provides an income generation opportunity for local residents. Since it is such a challenging, but promising project, my personal advice is to, again, take it step by step...

5.3 Which recommendations for the design of ecotourism result from this?

5.3.1 For government stakeholders and NGO's

When starting a new community-based ecotourism project, it is important to carefully take the social-political context into account beforehand. Trust from the local society should be gained in order to prevent political interference and jealousy among the community members.

The next step for successful ecotourism is that community members have to be educated on mangrove conservation, entrepreneurship and how to work with tourists. For this, regular, intensive training programs are needed in order for ecotourism to successfully contribute to CBMM.

In Sri Lanka, projects tend to fail due to a lack of monitoring, which causes pollution in the mangrove lagoon. Therefore, an important condition for a successful project is to have one party that monitors the project on its environmental aspects. For this, the question arises who is responsible for that task. Who is responsible for leading the project (after the government/NGO support stops)? Who checks whether the rules are being met? And if someone breaks the rules, who will hand out what kind of punishments? The answer to these questions should be made clear before implementing a project and documented in a management plan.

In line with the thoughts of Elinor Ostrom, it is recommended to set up a strong community organization for these responsibilities. This organization can hand out licenses and control a timetable system to ensure the carrying capacity of the lagoon is not exceeded. In order to let this community organization properly work, the community members should be educated on the importance of mangrove conservation and act out of the right intrinsic values, not out of self-interest. Furthermore, this community organization should fulfill all the conditions mentioned in table 1 for successful common-pool resource management.

To create independence, it is important to guarantee the project is financially sustainable in the long-term. Rather than just financial funding, provide facilities, knowledge and entrepreneurship skills. In this way,

project participants can generate their incomes by providing good-quality ecotourism activities.

The last recommendation for government stakeholders and NGO's is to collaborate with fishing communities, since they have a direct benefit from conserving mangroves and are already familiar with the lagoon.

Ecotourism is, overall, in need of a proper working monitoring system, broad educational programs and a community association that controls the licenses and fairly distributes the incomes. If not implemented correctly, ecotourism will almost certainly create higher pollution of the mangrove lagoon. Government bodies in Sri Lanka struggle in providing this due to a lack of staff members, funding and technical knowledge. Therefore, always carefully take into consideration whether ecotourism should be implemented if you do not have facilities and staff members to guide the process successfully.

5.3.2 For boat tour operators

To learn more about ecotourism, mangroves and how to run a sustainable business, it is important for boat tour operators to attend the education programs. For ecotourism project holders in Sri Lanka, USAID recently wrote a very helpful report which discusses ways to achieve sustainability in the Sri Lankan tourism sector, with a particular focus on the Micro, Small, and Medium Enterprises (2023). It gives help in how boat tour operators can conserve nature, support communities and other drivers for running a sustainable business.

It is also recommended for boat tour operators to gain knowledge in entrepreneur skills and how to market their business. Ecotourism businesses can be promoted via websites, video's, travel bureau's or collaborations with local hotels. It is recommended to make sure your business is economically independent and not depended on funding from external organizations too much. Boat tour operators should focus on their selling-point and make their boat tour an experience in which tourists can learn more about the beauty of mangrove lagoons and its ecological aspects. Boat tour operators can also collaborate with researchers, students and academics to increase the knowledge on mangrove environments. Another recommendation is to make sure you do not exceed the carrying capacity of the lake and focus on keeping a small number of tourists for a longer stay, instead of rushing very short tours. Also, give tourists the opportunity to plant a tree themselves, if this can be done in an ecological friendly manner. It is also highly recommended to collaborate with small neighboring businesses to improve the community welfare. For example, include a lunch at a restaurant, or visit neighboring handicraft making. The last recommendation is to always ensure the mangrove environment benefits from your tours, instead of degrades. Do not use petrol or motor engines, but use paddling boats or solar power. Create environmental awareness among the tourists and do not harm the mangrove environment. Only if these conditions are taken into account, ecotourism can be successful.

5.4 Reflection

First a critical reflection on the theoretical framework of this research is given. Then a critical reflection is done on the methodological choices made and challenges within this research' validity and reliability are discussed.

5.4.1 Reflection theory

Looking at the theoretical concepts of CBMM and ecotourism used in this research, there are some reflective notes that have to be mentioned. In the literature, the term CBMM describes the management of mangrove forests by collective, local institutions for local benefit (Aspen et al.,2011). CBMM refers to decentralization of rights, by shifting responsibilities and authority on natural resources from government to local communities (Alcorn et al., 2002). However, my questions about this definition are: what if the local communities do not have the power to make decisions on their own? What if, in any case, an authority has to be involved to give approval on decisions? Decentralization of rights is in many cases in Sri Lanka impossible. However, although final decision-making has to be done by authorities, community associations still exist. They propose ideas, represent the voice of the community and collaborate with the government about the management of a mangrove area. Can such cases still be called community-based management? If not, CBMM approaches are not possible at all in Sri Lanka, due to its administrative system. My thoughts on this are critique. If the main goal of successful CBMM is to sustainably manage the mangrove ecosystems, involvement of the government does not always end up in negative consequences for the local community. Just like Wickramasinghe (2017) shows in his case studies, where the involvement of the central government is sometimes a crucial factor to guarantee long term sustainability of the project. In Sri Lanka, communities do not always possess a sufficient budget, knowledge and capable leaders. Collaboration with government bodies can help to sustainably manage the mangrove ecosystem. Especially, if the intention of the decision-making government body is to also support the communities. Since my thoughts on the role of the government within CBMM are doubtful, I recommend further research to examine this topic. Research is needed which answers the question to what extent government bodies can play a role within successful community based mangrove management. Furthermore, I recommend further research on this topic to use countries with different administrative systems to use as case studies for a comparative analysis.

My second reflective thoughts are based upon the precise relationship between the two concepts ecotourism and CBMM. CBMM shifts responsibilities and authority on natural resources from government to local communities (Alcorn et al., 2002). Ecotourism involves and empowers local people and provides considerable benefits for the environment, visitors and agencies (Cabahug, 2002). Holding on these definitions, you would assume ecotourism is a form of CBMM. Ecotourism involves and empowers local people and is a way to sustainably conserve a natural area. However, ecotourism is not in all cases a form of CBMM. Ecotourism does not provide local communities decision-making power to manage the area and does not decentralize legislation. Looking at benefits for the community, it can be said that ecotourism provides benefits in majority for the employers only and not for the whole community. In order for the benefits of ecotourism to count for the whole community, activities have to be organized by a community association instead of a single entrepreneur. Since these conditions have to be taken into account, it was impossible to directly state in this research that ecotourism is a form of CBMM in all cases. The relationship between the two concepts is complex and differs per case. Ecotourism is, actually, a term wrongly used in many situations. Boat tour operators, hotel owners and travel agencies already describe a nature-based tourism activity as 'ecotourism'. Misuse of the term leads to confusion and misunderstanding among all actors involved in a research on this topic. It could be very interesting for further research to examine this misunderstanding and make an analysis with more of a narrative approach.

A last reflective thought that is given on the theoretical framework of this research is about all the conditions that cause successful CBMM. First of all, on the division of all these conditions in a technical, political, social and economic dimension. These dimensions were used to bring structure into the analysis, but it should be mentioned that almost all conditions are interrelated and conditions in different dimensions strongly overlap. Furthermore, it is tried as much as possible to gather all the data known on CBMM, but it cannot be guaranteed every condition mentioned in the literature is taken into account. Nevertheless, from the results it seemed all conditions were already discussed in the theoretical framework and no new, surprising conditions appeared. This could be a sign that the most important conditions are, by all means, discussed.

5.4.2 Reflection methodology

Next to a reflection on the theoretical framework, I also want to critically reflect on the methodological choices made in this research.

An important methodological choice for this research was to conduct in-depth interviews to collect data. In some cases, this created challenges in culture-difference and language barriers between the researcher and the participants. The language barrier between the researcher and the local citizens in Sri Lanka might have led to incorrect understanding of some word meaning interviews. Although most Sri Lankans speak English, it was sometimes hard to understand each other and in two interviews it was necessary to involve a translator. Also, the communication style of Sri Lankans is polite, indirect and ambiguous (Scroope, 2016). When Sri Lankan people talk to people who they do not know well, they may tell them what they want to hear to avoid conflict. However, conducting in-depth interviews has also been one of the very good aspects of this research. Participants were given a chance to tell their detailed story, felt like they were heard and expressed their feelings. This resulted in valuable data and detailed information about the current challenges and successes of CBMM and ecotourism.

The second reflection is about the choice of interview participants. Sending requests and conducting interviews was in some situations difficult, since I do not come from Sri Lanka and my network was very small. A critical note has to be given on the decision to mainly interview boat tour operators for the data collection of this research. Ecotourism includes all forms of tourism that include nature conservation and livelihood participation. In this research, however, only boat tour operators are interviewed and no other forms of ecotourism are examined. Mainly, because in Sri Lanka, no other forms existed within the mangrove lagoon areas. On the one hand, this causes exclusion of all other forms of ecotourism. On the other hand, it was not deliberately chosen to exclude other forms, since they simply did not exist. For further research, however, it is recommended to use cases where different forms of ecotourism exist to ensure inclusion.

Another critical note that can be made on the choice of interview participants is that not all the government stakeholders are interviewed. The Forest Department and Wildlife Department did not respond to the requests. Therefore, their opinions are not taken into account in this research. To tackle

this, their policies have been analyzed and it is tried as best as possible to involve thoughts of other government stakeholders. A last important methodological choice that has been made is to ensure the participants anonymity. Due to the political instability of Sri Lanka, participants prefer to stay completely anonymous. Because of the anonymity, respondents were less inclined to give more genuine answers and less socially desirable answers.

Overall, it should be mentioned that I am very content with the quality of the data and amount of interviews conducted. Although my network was small, interviews were conducted with all relevant people and Sri Lankans were well-willing to help. After a certain amount of interviews, theoretical saturation of the results occurred, as participants began to give consistent answers and patterns in the data arose. When patterns showed, it was tried as much as possible to test this pattern and conduct interviews with actors who had a different view to get a complete view. In this way, the legitimacy of the findings were ensured which contributes to the validation of this research.

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7.0 Appendix

7.1 Appendix 1 Operationalization scheme

	A type of tourism that...	The ecotourism company...	
Ecotourism	Involves local communities (Fennel, 2014), (Ross & Wall, 1999)	Has all employees living in the case study area.	
		Organizes mangrove conservation/restoration projects that involve local community members. Restoration means the “process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed” (Tengberg et al., 2020)	F.e. mangrove replantation projects or collecting garbage with the community etc.
		Visits community members during the activity.	F.e. Visit a local restaurant, handcraft making, fish therapy etc.
	Conservates nature (Fennel, 2014), (Ross & Wall, 1999)	Does not cut/touch mangrove trees, only watching is allowed.	
		Does not throw garbage into the lagoon or pollutes the neighborhood.	
		Organizes mangrove conservation and restoration projects in which mangrove trees are planted in the case study area in an ecological friendly way. Restoration means the “process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed” (IUCN, 2011, p.43)	
		Uses rowing boats or boats with solar energy motors. No kerosine engines.	
		Has a board with intrinsic motivation to conserve the mangroves and is passionate about nature and the environment (Nelson, 1994).	Board members express their love for nature and talk passionately about their motivation to conserve mangroves.
		Creates environmental awareness (Ross & Wall, 1999) (Fennel, 2014)	Organizes mangrove conservation/restoration projects or workshops/training about environmental aspects of mangroves for tourists and community members.

		Provides information on the environmental contribution of mangrove forests during the tour.	Tour guide explains about the importance of mangroves for the environment and the ecological contributions of the forests during the tour.
		Makes use of information posters, folders or a website to create awareness on the environmental contribution of mangrove forests.	
	Generates revenue for the local participants (Fennel, 2014), (Ross & Wall, 1999)	Organizes activities that are paid by tourists.	F.e. boat tours, bird watching, camping.
		Distributes the benefits in accordance with the costing a participant has made (Suharti et al., 2022).	
		Is not completely dependent on funds, but also organizes activities to generate money independently.	
	Is nature based (Fennel, 2014), (Ross & Wall, 1999)	The ecotourism center is located within or very near the mangroves/lagoon.	
Mangroves	<p>Definition:</p> <p>Mangroves are the characteristic littoral plant formations of tropical and subtropical sheltered coastlines. They have been variously described as 'coastal woodland', 'tidal forest' and 'mangrove forest.'. Generally, mangroves are trees and bushes growing below the high-water level of spring tides.</p> <p>(Forest Resources Development Branch et al., 1997, p.5)</p>		
Community Based Mangrove Management	A way of management in which...		
	Mangroves are sustainably managed (Datta et al., 2012)	Mangrove trees are conserved on the long-term and if possible, replanted. Mangrove lagoons are by all means protected from cutting and pollution.	
	Community members are the main actor in every step of the decision-making process (On-prom, 2014).	Use of participatory approaches that are truly accessible, interactive and responsive (Krumpe & McCoy, 1995).	
		Responsibilities and authority on natural resources are shifted from government to local communities (Alcorn et al., 2002).	

Successful CBMM	CBMM in which all mangroves are sustainably managed, the lagoon is not polluted and community members are happily the main actor in every step of the decision-making process. For this, conditions named below have to be met as far as possible.	How to measure the degree of success? The average of degrees mentioned below: <ul style="list-style-type: none"> - Degree of mangroves conserved - Degree of nonpollution in the lagoon. - Degree of community members involved. - Degree of income generated through the CBMM. - Degree of community members that feel positive about the CBMM project. - Degree of conditions that are met that lead to successful CBMM.
Economic conditions	In order for CBMM to be successful, it economically requires...	
	Funding and/or the generation of financial incomes (Wickramasinghe, 2017)	Financial funding from NGOs, Government bodies or international organizations or other income generation.
	A project that covers the quality of life of low-income families (Suharti et al.,2022).	by providing environmentally friendly skills, investments and work opportunities (Suharti et al.,2022).
	a method that is oriented towards conservation of biodiversity and at the same time focused on increasing productivity for financial benefits (Ginantra, 2022).	F.e. ecotourism.
	A distribution of benefits that is in accordance with the costing a stakeholder has made (Suharti et al., 2022) (Ostrom, 2008).	
Social conditions	In order for CBMM to be successful, it socially requires...	
	Continued, committed community participation (Wickramasinghe, 2017) (Ostrom, 2008).	Participation of the same community members during the entire period of time the project exists.
	Support from the	Active involvement of all stakeholders

	neighborhood (Suharti et al.,2022),	(Suharti et al.,2022),
		Neighbors are interested, supportive and helpful. No envy.
	That the community or group that lives within the resource is the same as the group that makes the decisions over the resource and the same as the group that benefits (Bond et al., 2006) (Ostrom, 2008)	
	Use of the local wisdom (Hakim et al., 2017)	
Technical conditions	In order for CBMM to be successful, it technically requires...	
	That habitat and diversity factors of mangroves are taken into account and ecological dynamics are maintained (Datta et al., 2012).	Community members have capacity and know-how on conserving specific areas of mangrove forests (Wickramasinghe, 2017).
	Monitoring on the projects (Wickramasinghe, 2017) (Ostrom, 2008)	Monitoring on: Are the mangroves conserved? Is the community actively involved? Does every community member get a fair distribution of the income? Done by an external party, government body or community representative.
	Support by local government, academe and others in using the right applicable criteria and indicators (Wickramasinghe, 2017) (Ostrom, 2008)	by providing workshops, training and technical/financial support.
	Well defined boundaries (Ostrom, 2008)	User boundaries: Clear boundaries between legitimate users and nonusers must be defined. Resource boundaries: Clear boundaries are present that define a resource system and separate it from the larger biophysical environment.
Political	In order for CBMM to be	

conditions	successful, it politically requires...	
	Strategic Collaboration (Damastuti et al., 2023)	A way of government with clear responsibility tasks and limited communication barriers.
	Capable leaders (Damastuti et al., 2023)	People who stimulate collective and active involvement and action of all stakeholders, are passionate about conserving mangroves and keep close, long-term contact with the community members.
	Support by all levels of the government Wickramasinghe (2017) (Ostrom, 2008)	Financial, technical and policy oriented support. No nepotism, favoritism or bribery.
		Enough staff members and resources to be able to support and monitor the project (Phong et al., 2023)
	A revised, implemented management plan (Tveit et al., 2007)	In which all responsibilities are divided among the stakeholders and goals and actions are formulated to conserve the mangroves.
A mechanism for conflict resolution (Suharti et al., 2022 (Ostrom, 2008)	Sanctions for when members don't follow the law. For this, police also need a mutual understanding about the laws on mangrove management and knowledge on mangrove species.	

7.2 Appendix 2 Overview interview participants and observations

Actor	Participants	Area	Location	Observation	Date
Boat tour operators	Mr. Weerasingha, manager Muthurajawela Visitor Center	Negombo Lagoon	Telephone	Visitor center, boat tour	30-09-2023
	Shanaka, owner River viewer boat tours	Negombo Lagoon	Boat tour center	Boats, River, Office, start location	30-09-2023
	Mr. Lalith, boat tour operator Eco Isle	Madu Ganga Estuary	Boat tour center	Boat tour, hotel	3-10-2023
	Green Lagoon Boat safaris	Madu Ganga Estuary	Lake	Boat tour	6-10-2023
	Mr. Janaka, boat tour operator Eco Escape	Galle	Boat tour center	Boat tour center	9-10-2023
	Fishing community Pottuvil lagoon, 6 representatives	Pottuvil	Boat tour Center	Visitor center, boats, lagoon	18-10-2023
	Fishing community Urani Lagoon, 7 representatives	Pottuvil	Boat tour Center	Visitor center, boats, lagoon	18-10-2023
	Boat tour center	West Sri Lanka	Boat tour Center	Boats, Lagoon, start location	29-9-2023
Project Leaders Community Based Tourism Projects	Mr. Faizarsulfi, Natural Tour Guide and Project Leader	Arugam Bay, Pottuvil Lagoon and Urani Lagoon	Office	Office	17-10-2023
	Mr. Sajeewa, Project director Nagenahiru information center	Galle	Boat tour center	Visitor center	7-10-2023

NGO	Representatives EMACE		Online		5-10-2023
Lanka Mangrove Museum	Director and education officer Lanka Mangrove Museum		Mangrove Museum, Chilaw	Mangrove Museum	16-11-2023
Coastal Resource management at Coastal Conservation Department (CCD)	Mr. B. H. J. Premathilake		Office Coastal Conservation Department, Colombo		3-10-2023
Deputy Director General & Head, Sustainable Tourism Unit, Tourism Authority And Author: <i>'Challenges to ecotourism in Sri Lanka: an Assessment'</i> (2007) <i>'A collaborative approach between tourism and coastal communities: a present-day need and opportunity for mangrove management and conservation in Sri Lanka'</i> (2012)	Mr. Upali Rathnayake		Office Tourism Authority, Colombo		20-11-2023
Project manager Biodiversity Secretariate, Ministry of Environment	Dr Manoj Prasanna		Hotel lobby, Negombo		3-12-2023

Researchers	K.P.G.L.Sandar uwan, National Aquatic Research Association and Development Agency		NARA research center, Colombo		4-10-2023
	Mr. Sujeewa Jasinghe, Managing Director - Centre for Eco- cultural Studies (CES)		Hotel lobby, Colombo		20-11-2023

8.3 Appendix 3 Interview guides

Interview guide ecotourism boat tour operators

Introduction

Hello sir/madam, my name is Nelke Eshuis, I am a student at Radboud University in the Netherlands and I study geography and spatial planning. I am writing my Master Thesis about the contribution of ecotourism to Community Based Mangrove Management in Sri Lanka. You are and therefore, I want to conduct an interview with you. Before we start, do you have any questions and are you okay with it if I record this interview?

- First, can you tell me who you are and what your job is?

The product → can it be called ecotourism?

- Where did it all start? What were your motivations to start this business idea? **implicit motivation**
- What is your product precisely, what do you offer?
- Where do your employers come from? (are they local community members?) **Community involved**
- Do you provide a form of education/awareness for visitors and community members? **Education**
- If yes, in what way? If no, why not?
- How do you ensure your practices are environmentally sustainable? **Conservation**

Ecotourism

- What do you think about Ecotourism in Sri Lanka?
- and under which conditions can it be a success in conserving mangroves?

How do you think ecotourism contributes to conserving mangroves in a social way?

Social

- ✓ **commitment and interest of participants**
- ✓ **support of the neighborhood**
- ✓ **provide skills and investments for environmentally friendly work opportunities**
- ✓ **communities living within the mangrove forest should be the ones managing the forest and deserving the credits/revenues**

How do you think ecotourism contributes to conserving mangroves in a technical way?

Technical

- ✓ **Capacity and know-how on conserving specific areas of mangrove forests.**
- ✓ **monitoring on conservation**
- ✓ **boundaries of the CB Mangrove area**

How do you think ecotourism contributes to conserving mangroves in an economical way?

Economic

- ✓ **Funding/generating incomes**
- ✓ **Incentives and incomes are fairly distributed and of measurable value for the local community**

How do you think ecotourism contributes to conserving mangroves in a political way?

Political

- ✓ **Involvement of the central government**
- ✓ **Active involvement stakeholders**
- ✓ **flexibility in law enforcement**
- ✓ **capability of integrating restoration programs**
- ✓ **mechanism for conflict resolution**

Overall, do you think ecotourism might contribute to CBMM? and if implemented, which conditions should it meet?

Thank you. If I have any further questions. Can I email you?

Interview guide government employees CBMM

Introduction

Hello sir/madam, my name is Nelke Eshuis, I am a student at Radboud University in the Netherlands and I study geography and spatial planning. I am writing my Master Thesis about the contribution of ecotourism to Community Based Mangrove Management in Sri Lanka. You are and therefore, I want to conduct an interview with you. Before we start, do you have any questions and are you okay with it if I record this interview?

- First, can you tell me who you are and what your job is?
- How is your job related to mangrove management?

CBMM implementation

In my research I analyze the contribution of ecotourism on CBMM. Under CBMM, I understand an approach of mangrove management in which the local community is part of every step in the management process.

- Does your department have a policy on how to integrate CBMM? (can you send it to me?)
- How is the integration of the program going? **capability of integrating restoration programs**
- Have you experienced implementing a community based mangrove management project?
- What was it called and where was it located?
- were you involved as central government (**Involvement of the central government**)
- Did you have to apply any flexibilities in your law enforcement? (**flexibility in law enforcement**)
- If yes, then which ones?

Did the project reach its goals formulated in the program?

If not, what were obstacles? If yes, what were its successes?

Political

- ✓ ***Involvement of the central government***
- ✓ ***Active involvement stakeholders***
- ✓ ***flexibility in law enforcement***
- ✓ ***capability of integrating restoration programs***
- ✓ ***mechanism for conflict resolution***

What do you think is needed to stimulate more CBMM programs?

How do you think ecotourism might play a role in this?

Do you think ecotourism might contribute to the successes of community based mangrove management?

Thankyou. If I have any further questions, may I email you?

Interview guide government employees Ecotourism

Introduction

Hello sir/madam, my name is Nelke Eshuis, I am a student at Radboud University in the Netherlands and I study geography and spatial planning. I am writing my Master Thesis about the contribution of ecotourism to Community Based Mangrove Management in Sri Lanka. You are and therefore, I want to conduct an interview with you. Before we start, do you have any questions and are you okay with it if I record this interview?

- First, can you tell me who you are and what your job is?
- How is your job related to ecotourism management?

Ecotourism implementation

In my research I analyze the contribution of ecotourism on CBMM.

- Does your department have a policy on how to integrate ecotourism? (can you send it to me?)
- How is the integration of the program going? **capability of integrating restoration programs**
- Have you experienced implementing an ecotourism management project?
- What was it called and where was it located?
- were you involved as central government (**Involvement of the central government**)
- Did you have to apply any flexibilities in your law enforcement? (**flexibility in law enforcement**) If yes, then which ones?

Did the project reach its goals formulated in the program?
If not, what were obstacles? If yes, what were its successes?

Political

- ✓ ***Involvement of the central government***
- ✓ ***Active involvement stakeholders***
- ✓ ***flexibility in law enforcement***
- ✓ ***capability of integrating restoration programs***
- ✓ ***mechanism for conflict resolution***

What do you think is needed to stimulate more Ecotourism programs?

Do you think ecotourism might contribute to the successes of community based mangrove management?

Thankyou. If I have any further questions, may I email you?

Interview experts (researchers)

Introduction

Hello sir/madam, my name is Nelke Eshuis, I am a student at Radboud University in the Netherlands and I study geography and spatial planning. I am writing my Master Thesis about the contribution of ecotourism to Community Based Mangrove Management in Sri Lanka. You are and therefore, I want to conduct an interview with you. Before we start, do you have any questions and are you okay with it if I record this interview?

- First, can you tell me who you are and what your job is?

CBMM

In my research I analyze the contribution of ecotourism on CBMM. Under CBMM, I understand an approach of mangrove management in which the local community is part of every step in the management process.

- You work for / conducted a research about , according to your research, do you think CBMM is working out well in Sri Lanka?
- Have you experienced implementing a community based mangrove management project?
- Did the project reach its goals?
- If not, obstacles? If yes, how did it become a success?

Ecotourism

- What do you think about Ecotourism in Sri Lanka?
- and under which conditions can it be a success in conserving mangroves?

How do you think ecotourism contributes to conserving mangroves in a social way?

Social

- ✓ *commitment and interest of participants*
- ✓ *support of the neighborhood*
- ✓ *provide skills and investments for environmentally friendly work opportunities*
- ✓ *communities living within the mangrove forest should be the ones managing the forest and deserving the credits/revenues*

How do you think ecotourism contributes to conserving mangroves in a technical way?

Technical

- ✓ *Capacity and know-how on conserving specific areas of mangrove forests.*
- ✓ *monitoring on conservation*
- ✓ *boundaries of the CB Mangrove area*

How do you think ecotourism contributes to conserving mangroves in an economical way?

Economic

- ✓ *Funding/generating incomes*
- ✓ *Incentives and incomes are fairly distributed and of measurable value for the local community*

How do you think ecotourism contributes to conserving mangroves in a political way?

Political

- ✓ *Involvement of the central government*
- ✓ *Active involvement stakeholders*
- ✓ *flexibility in law enforcement*
- ✓ *capability of integrating restoration programs*
- ✓ *mechanism for conflict resolution*

Overall, do you think ecotourism might contribute to CBMM? and if implemented, which conditions should it meet?

Thank you. If I have any further questions. Can I email you?