

# Why should we protect mangroves?

## Introduction

Mangroves are salt-tolerant trees and shrubs that can be found in coastal areas on tropical and subtropical latitudes. There are 73 different species of mangroves in total around the world (Sandilyan and Kathiresan, 2012). Mangroves have unique qualities and plays an important role when it comes to biodiversity both on land and in the ocean. They are essential habitats for many species and supply a lot of ecosystem services to humans (Strong & Minnemeyer, 2015). Protection of the mangroves is relevant to several of the SDGs, and in this paper, we focus on the goals related to ecological and social issues. Although mangroves are such valuable ecosystems, unfortunately they are decreasing, and their biggest threat is human activity and sea level rise. Mangroves need to be protected to prevent irreplaceable loss of vital ecosystem services to humankind. (Sandilyan and Kathiresan, 2012).

## Why are mangroves important?

Mangroves are important habitats for many different species, both on land and below water (Sandilyan and Kathiresan, 2012). On land, many birds nest, feed and rest in the canopy, and mammals like fruit bats and the Royal Bengal tiger reside in the mangrove forests. Below water, their roots stabilize the sediments and provide perches, making the ground beneath them a suitable habitat for various invertebrates like molluscs, crabs and prawns. They also provide protection against pollutants from run-off for nearby coral reefs and seagrass meadows, which are also important and biodiverse ecosystems themselves (Sandilyan and Kathiresan, 2012). Many species of fish seek shelter and feed in the mangroves, and it is an important nursery ground for many commercially important fishes (Nagelkerken et al., 2008).

Several of the species that live there are endemic to mangrove ecosystems, meaning that they cannot be found anywhere else. Therefore, if mangroves go extinct, many of these unique species will no longer have a habitat to live in (Sandilyan and Kathiresan, 2012). Because they are so important to biodiversity, they are also relevant to SDG 14 and SDG 15, especially 14.2, protect and restore ecosystems, and 15.5, protect biodiversity and natural habitats. Biodiversity conservation in general is important both because species have a value in themselves and we should try to avoid causing them too much harm, and because different species provide different ecosystem services. Mangroves in particular are important in this regard because they support such high levels of biodiversity (Sandilyan and Kathiresan, 2012).

Mangrove trees does not only supply people with wood and commercial fishing, but also by regulating storms, floods, and saltwater intrusions. They help reduce soil erosion, which helps keep the land habitable and helps keep the water quality up, making commercial fishing easier (Brander et al., 2012). If the mangroves get removed, soil erosion can lead to shoreline erosion and siltation. The fish that is used for commercial fishing can be found in natural habitats in the mangrove forests. By providing habitats for commercially important species, they contribute to both SDG 1, no poverty, and SDG 2, zero hunger. Several of the ecosystem services that come from mangrove trees like fisheries have been deemed as public goods that people can't live without because they depend on the recourses. Mangroves are considered undervalued when it comes to usage, conservation, and restoration, which comes from the lack of understanding of the value of mangrove ecosystem services (Brander et al., 2012). One of the most important ecosystem services is how mangroves absorb carbon dioxide and can store the carbon in their sediments, which lessens the impact of global warming and will help with SDG 13, climate action. The forests also work as a buffer for the land by reducing the destructive impact of tidal surges, high tides, and

cyclonic storms or high winds. Some of the most commonly used goods from mangrove ecosystems are firewood, medicines, fibers, different types of food, charcoal, and building materials (Brander et al., 2012).

### **Why do they need protection?**

Even though the importance of mangroves is scientifically proven as presented above, the amount of mangrove forests has been decreasing significantly. For example, Strong and Minnemeyer (2015) found that between 2000 and 2012, 1.38 % of worlds mangrove forests have been destroyed. Almost half of the loss happens in Asia, where most mangrove forests with particularly high biodiversity are located. However, there have also been positive development in protection of mangroves. Part of the reason for this is that after natural disasters, the importance of mangroves has been recognized and the loss rate has slowly started to decrease (Sandilyan & Kathiresan, 2012; Strong & Minnemeyer, 2015). There have been efforts to restore mangrove forests, but for example in Philippines less than 20 % of planted mangroves survived. However, in projects where the hydrology has been changed to benefit the mangroves, they have been able to regrow themselves effectively (Waters, 2016).

Despite the increase in protection, there are many threats that cause mangrove losses. The main threat to mangroves is human action, both directly and indirectly (Sandilyan & Kathiresan, 2012). According to several resources (see e.g., Gilbert & Janssen, 1998; Strong & Minnemeyer, 2015) one of humans' greatest incentives to destroy mangroves has been expansion of aquaculture, such as fishing and especially shrimp farming. Even though aquaculture corresponds to the SDG 2, Zero hunger, achieving it at the expense of mangroves conflicts with SDG Target 14.2, which highlights protection of coastal ecosystems.

Land based activities also pose a threat to mangroves. Many land-based pollutions such as fertilizers, pesticides and oil spills harm mangroves (Strong & Minnemeyer, 2015). Thus, it would be an advantage for mangroves if SDG Target 14.1 would be achieved so that land-based pollution would be reduced. Also, according to Strong and Minnemeyer (2015) agriculture expansion has taken over areas from mangroves. In addition, mangrove forests are harvested to spread urbanization to coastal areas, for example due to tourism. (Strong & Minnemeyer, 2015). From the perspective of SDG 1, no poverty, there is a challenge of how to protect mangroves and enable the viability of local people's livelihoods, such as attract tourists. A more indirect human caused threat is the climate change and especially the sea level rise (Cohen et al., 2018). When sea level rises, mangroves invade to higher areas, but these areas are not always suitable for mangroves. For example, due to excessive salinity or deterioration of the tidal phenomenon, mangroves may not survive (Cohen et al., 2018). Consequently, the progression of SDG 13, climate action also has a beneficial effect on the protection of mangroves.

### **Conclusion**

The value of mangroves has been underestimated for a long time, which has led to large mangrove losses around the world. However, in recent years broader knowledge has led to greater appreciation for the important ecosystem. The value of mangroves, both in terms of biodiversity and the protection of natural extremes, has been identified, which has increased the protection of mangroves. During the last decades there have been some unsuccessful restoration attempts, but researchers have also found promising methods to revive suffering areas. Rather than growing and planting the trees, changing the hydrology seems to help the mangroves regrow by themselves. In order to achieve the sustainable development goals, mangroves must be protected to a greater extent. Related to SDG14 there would be room for more research on how to combine protection of mangroves with strengthening livelihoods of coastal communities.

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