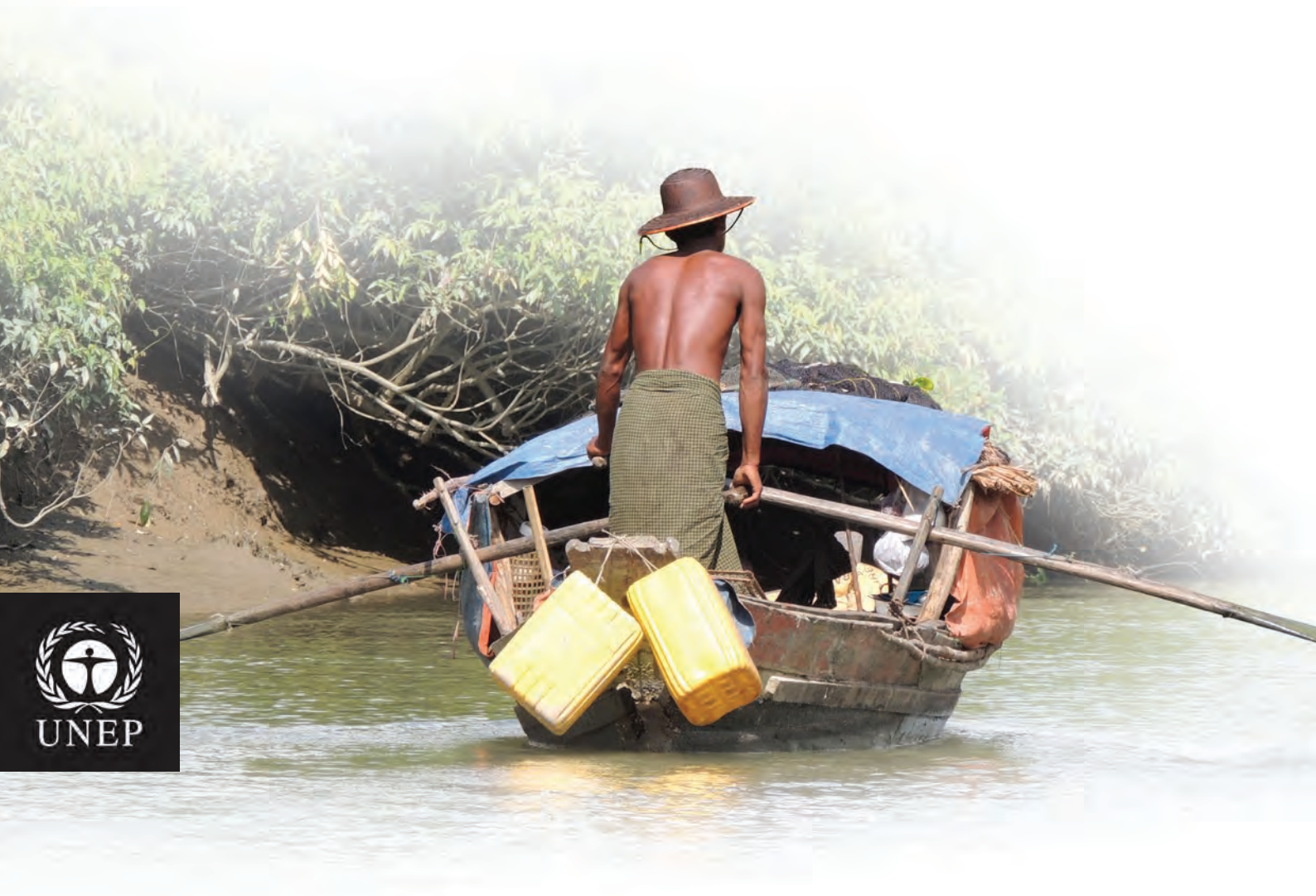
THE IMPORTANCE OF MANGROVES TO PEOPLE: A CALL TO ACTION



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The United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) is the specialist biodiversity assessment centre of UNEP, the world's foremost intergovernmental environmental organisation. The Centre has been in operation for over 30 years, combining scientific research with practical policy advice.

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Foreword – Achim Steiner

Tropical mangroves around the world connect our land and its people with the sea, providing millions with food, clean water, raw materials and resilience against future climate change impacts including increasing storm intensity and sea level rise.

Together with coral reefs, seagrass meadows and intertidal mudflats and marshes, these complex interconnected ecosystems are home to a spectacular range of visiting and resident species of birds, mammals, invertebrates and fish, all of which helps to maintain the ecological functioning of mangroves. In turn, this rich mosaic of biodiversity supports people through fisheries, tourism and cultural heritage.

This publication provides a timely synthesis of the importance of mangroves to people. It highlights that in spite of the mounting evidence in support of the multitude of benefits derived from mangroves, they remain one of the most threatened ecosystems on the planet, being lost at a rate greater than coral reefs and tropical rainforests. This has potentially devastating effects to mangrove biodiversity and in turn, the food security, protection and livelihoods of some of the most marginalised coastal communities in developing countries, where more than 90 percent of the world's mangroves are found.

Research is increasingly pointing to the role of mangroves as significant carbon storage systems, sequestering vast amounts of carbon – about 1,000 tonnes of carbon per hectare – over thousands of years. With continuing deforestation, this coastal "blue carbon" is at risk of being released back into the atmosphere when mangroves are cut down and converted into shrimp ponds or replaced by hotels, ports or used as landfill. Emissions resulting from mangrove losses make up nearly one-fifth of global emissions from deforestation, resulting in economic damages of some US$ 6-42 billion annually.

Understanding and quantifying the ecosystem services provided by mangroves to people will go a long way to helping secure their future and turn the tide on their devastation. The report notes that over 100 million people around the world live within 10 kilometres of large mangrove forests, benefiting from a variety of goods and services such as fisheries and forest products, clean water and protection against erosion and extreme weather events. These ecosystem services are worth an estimated US$ 33-57,000 per hectare per year to the economies of developing countries with mangroves.

The report provides a range of policy and management interventions that can be used to better protect, sustainably use and restore mangroves to ensure they continue to support the people who have depended on them for generations. These include financial mechanisms and incentives to stimulate mangrove conservation, such as REDD+, private sector investments, and the creation of Nationally Appropriate Mitigation Actions for developing countries to reduce greenhouse gas emissions while increasing national capacity.

I hope this call to action will serve to inspire decision makers around the world to take action to protect and restore these magnificent forests of the sea.

Achim Steiner
Executive Director
United Nations Environment Programme

A call to Action – Jurgenne Primavera

Mangroves are one of the most undervalued ecosystems on earth. These remarkable forests are of great importance to coastal communities, providing not only a source of food and resources but also protecting coastlines, preventing erosion and regulating our climate. Yet, mangroves are also one of the most threatened ecosystems and continue to be cleared at an alarming rate. In the Philippines alone, over 50% of mangroves have been lost since 1918, largely as a result of the establishment of aquaculture ponds.

Typhoon Haiyan - known as Typhoon Yolanda in the Philippines - was the strongest storm on record when it hit my country on the 8th of November 2013, killing over 6000 people and destroying over one million homes. This disaster served as a wake-up-call to the world, highlighting the vulnerability of coastal countries to the impacts of climate change. It also highlighted the important role that mangroves can play as nature's "bioshields", serving as a natural buffer which can reduce the wave energy and height of storm surges and thus protect vulnerable coastal communities. Together with coastal engineering, public education, elevated shelters and early warning systems, mangrove forests can help save lives and reduce the economic losses accrued by coastal communities and mangrove nations.

There has been increasing recognition of the defensive value of mangroves in the Philippines, spurred on by the devastating impact of Typhoon Haiyan. Our Government is investing over US$20 million into mangrove replanting and local governments are being encouraged to develop greenbelts of mangrove and beach forests as natural protection against storms. However, these actions need to be ecologically and scientifically sound, allowing mangroves to recover, learning from past mistakes and building on successes to ensure use of appropriate methods.

Mangroves not only form a line of coastal defence for the adjacent populations, but also help to mitigate climate change. In recent decades, research has shown that mangrove ecosystems store large quantities of carbon in their biomass and soil; several times more than their terrestrial counterparts. Protecting these long-term reservoirs of carbon and preventing their emissions back into the atmosphere is a sensible and cost-effective measure that can be taken to help mitigate climate change, whilst also ensuring the maintenance of the host of other ecosystem services that are so critical to the food security and livelihoods of millions of people.

This 'Call to Action' provides evidence for the importance of mangroves to people and the implications to their well-being if we continue to undervalue mangroves as we have over the past decades. Thankfully, there is still time to turn the tide and avert the considerable ecological, social and economic costs now, and in the future. I hereby call on governments to take note of the key messages and policy options presented in this report and use them to take action and secure a future for mangroves.

Jurgenne Primavera
IUCN Mangrove Specialist Group Co-Chair
and ZSL's Chief Mangrove Scientific Advisor

Mangroves – Magnificent Forests on the Edge

Arun Roisri / Shutterstock.com

Mangroves are a type of tropical forest, uniquely positioned at the dynamic interface of land and sea. They are found along coasts and estuaries throughout the tropics and subtropics and are capable of thriving in salt water; prospering in conditions to which only a few species have adapted. Mangroves form the foundation of a highly productive and biologically rich ecosystem which provides a home and feeding ground for a wide range of species, many of which are endangered. Although mangroves make up less than one percent of all tropical forests worldwide, they are highly valuable ecosystems, providing an array of essential goods and services which contribute significantly to the livelihoods, well-being and security of coastal communities.

The complex network of mangrove roots can help reduce wave energy, limiting erosion and shielding coastal communities from the destructive forces of tropical storms. Mangrove ecosystems are often an essential source of seafood for both subsistence consumption and the local and national seafood trade, in addition to providing other materials such as firewood and timber, which support the livelihoods of thousands of coastal communities. Beyond their direct benefits, mangroves also play an important role in global climate regulation. On average, they store around 1,000 tonnes of carbon per hectare in their biomass and underlying soil, making them some of the most carbon-rich ecosystems on the planet.

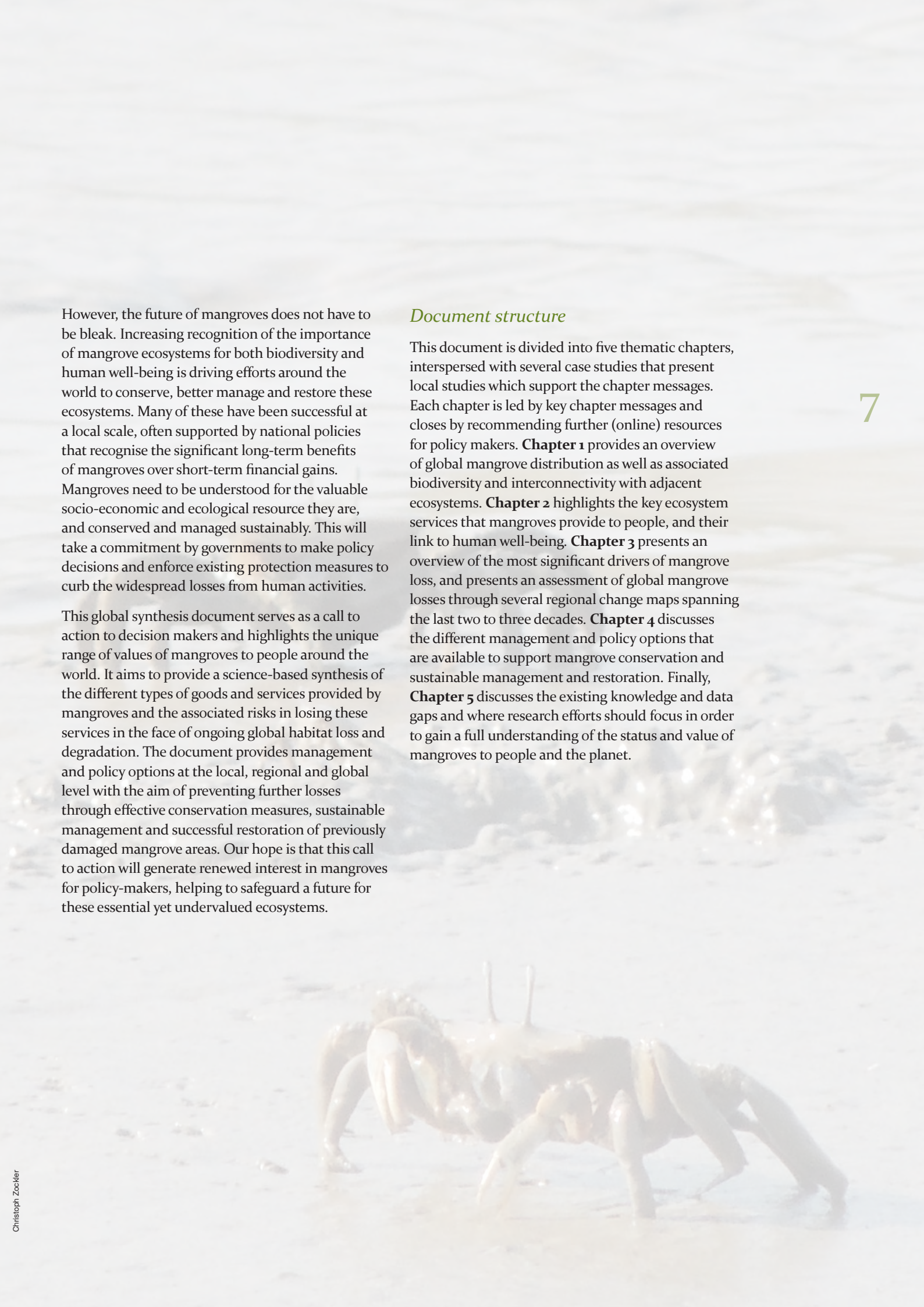
Despite its value, the mangrove ecosystem is one of the most threatened on the planet. Mangroves are being destroyed at rates 3-5 times greater than average rates of forest loss and over a quarter of the original mangrove cover has already disappeared; driven by land conversion for aquaculture and agriculture, coastal development, pollution and overexploitation of mangrove resources. As mangroves become smaller and more fragmented, important ecosystem goods and services will be diminished or lost. The consequences of further mangrove degradation will be particularly severe for the well-being of coastal communities in developing countries, especially where people rely heavily on mangrove goods and services for their daily subsistence and livelihoods.

However, the future of mangroves does not have to be bleak. Increasing recognition of the importance of mangrove ecosystems for both biodiversity and human well-being is driving efforts around the world to conserve, better manage and restore these ecosystems. Many of these have been successful at a local scale, often supported by national policies that recognise the significant long-term benefits of mangroves over short-term financial gains. Mangroves need to be understood for the valuable socio-economic and ecological resource they are, and conserved and managed sustainably. This will take a commitment by governments to make policy decisions and enforce existing protection measures to curb the widespread losses from human activities.

This global synthesis document serves as a call to action to decision makers and highlights the unique range of values of mangroves to people around the world. It aims to provide a science-based synthesis of the different types of goods and services provided by mangroves and the associated risks in losing these services in the face of ongoing global habitat loss and degradation. The document provides management and policy options at the local, regional and global level with the aim of preventing further losses through effective conservation measures, sustainable management and successful restoration of previously damaged mangrove areas. Our hope is that this call to action will generate renewed interest in mangroves for policy-makers, helping to safeguard a future for these essential yet undervalued ecosystems.

Document structure

This document is divided into five thematic chapters, interspersed with several case studies that present local studies which support the chapter messages. Each chapter is led by key chapter messages and closes by recommending further (online) resources for policy makers. **Chapter 1** provides an overview of global mangrove distribution as well as associated biodiversity and interconnectivity with adjacent ecosystems. **Chapter 2** highlights the key ecosystem services that mangroves provide to people, and their link to human well-being. **Chapter 3** presents an overview of the most significant drivers of mangrove loss, and presents an assessment of global mangrove losses through several regional change maps spanning the last two to three decades. **Chapter 4** discusses the different management and policy options that are available to support mangrove conservation and sustainable management and restoration. Finally, **Chapter 5** discusses the existing knowledge and data gaps and where research efforts should focus in order to gain a full understanding of the status and value of mangroves to people and the planet.



Christoph Zockler

Key Messages

Mangroves and their associated biodiversity help to deliver important goods and services that play a critical role in supporting human well-being through climate regulation, food security and poverty reduction. Over 100 million people live within 10 kilometres of large mangrove forests, benefiting from a variety of goods and services including fisheries and forest products, clean water and protection against erosion and extreme weather events. These ecosystem services are worth an estimated US$33-57 thousand per hectare per year to the national economies of developing countries with mangroves.

Mangroves can provide natural defenses against extreme weather events and disasters, helping to reduce the loss of property and vulnerability of local communities. In combination with other risk reduction measures such as sea walls and early warning systems, mangroves are often cheaper than solely conventional solutions and provide additional benefits like food, timber and carbon sequestration. Furthermore, mangroves can adapt to sea level rises and land subsidence in ways that engineered defenses cannot.

Mangroves have exceptionally high carbon stocks that are particularly vulnerable to land use change; greenhouse gas emissions (GHG) from the conversion of mangroves is among the highest of those from all land uses in the tropics. Emissions resulting from mangrove losses

In spite of their importance to people, mangroves are consistently undervalued and do not figure adequately in decision making about coastal development so that mangroves continue to be lost at a rate that is 3-5 times greater than global deforestation rates. As a result, people may be deprived of mangrove ecosystem services within the next 100 years, with significant consequences for economies and societies through impoverished livelihoods, lower economic growth, declining human security, and a poorer quality of life for coastal populations. While the benefits derived from healthy mangroves are mostly realised by local communities, the loss of mangroves also impacts negatively on coastal populations, national economies and the world as a whole. Mangrove ecosystem health and productivity must therefore be part of global efforts to eradicate poverty, strengthen food security and reduce vulnerability to climate change.

Given their continued, rapid decline, the remaining mangrove ecosystems must be protected and sustainably managed in order to secure their long-term future and the well-being of those who depend on them. Protected areas embedded into an integrated coastal management approach that ensures the survival of associated interconnected ecosystems such as mudflats, coral reefs and seagrass beds, will maximise ecosystem service benefits.