



# The Big Blue

*Supporting Blue Carbon  
Ecosystems in South-East Asia*

*The Key Role of Nonprofits and Philanthropy*

**IMPACT46**

Powered by **UBS Optimus Foundation** and the **UBS Climate Collective**

The purpose of this report is to share learning from the first 2 years of operating the UBS Climate Collective in Southeast Asia. The Collective is currently composed of 9 high-impact organisations, supported by UBS Optimus Foundation and a select group of forward-looking philanthropists. The report is intended especially for philanthropists and impact investors who are supporting - or interested in supporting- climate action and blue carbon development.

The report provides:

- (1) an overview of trends, opportunities and challenges related to the development of a blue carbon market in Southeast Asia;
- (2) a review of innovations and good practices across the region;
- (3) lessons learnt and a framework for action for philanthropists and impact investors interested in advancing blue carbon in Southeast Asia and beyond.

This report represents the collective effort by a team composed of Nicola Crosta, Elisa Sabbion, Franck Cachia and David Fullbrook. The report benefited from inputs and comments provided by Blue Ventures, CIFOR, GMT and UBS/UBS Optimus Foundation. The final report was prepared for publication by Magdalena Dolna.

Powered by **UBS Optimus Foundation** and the **UBS Climate Collective**<sup>1</sup>

---

<sup>1</sup>Including: Blue Forests, Blue Ventures, the Center for International Forestry Research (CIFOR), Climateworks Center, Earth Security, Forest Carbon, Global Mangrove Trust, the International Union for Conservation of Nature (IUCN) and the World Wide Fund for Nature (WWF).



# Contents

## Blue Carbon in Southeast Asia

Key Points	4
The UBS Climate Collective	6
<b>Part I</b> - Opportunities And Challenges	7
Blue Carbon: a significant opportunity	8
Why Southeast Asia	9
Key challenges	10
<b>Part II</b> - Innovation and Good Practices	14
The Need to Foster Blue Carbon Markets	15
Ten examples of High-Impact Innovations	15
<b>Part III</b> - A Framework for Action	26
Four Areas for Philanthropy	27
Lessons learnt so far	28
The case for collective action	30
Bibliography	31

# Key Points

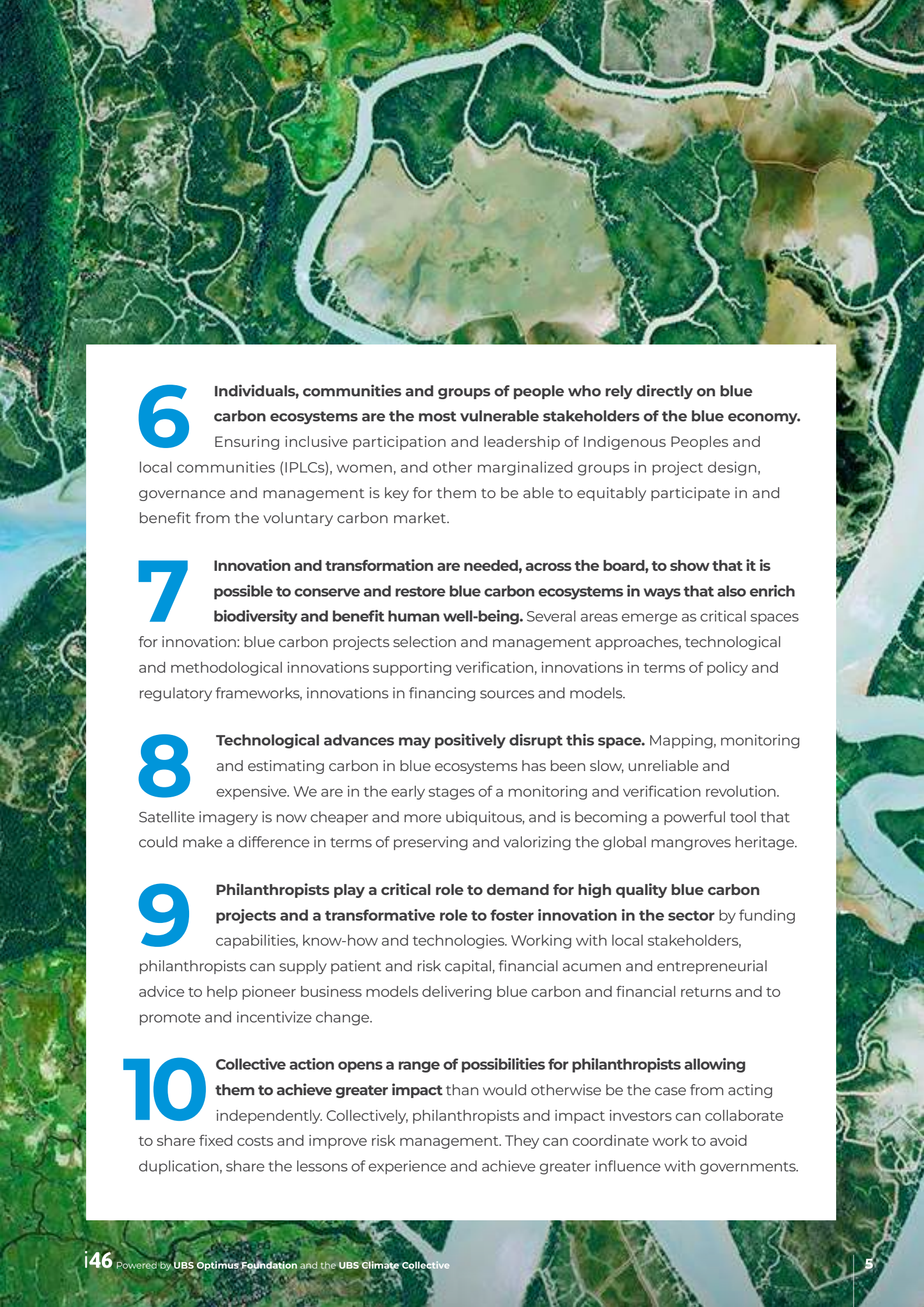
**1** **Blue carbon ecosystems, like mangroves, tidal marshes and seagrass meadows draw carbon from the atmosphere up to 10 times faster than tropical forests.** Rising emissions is fueling rising interest in blue carbon removals and more attention is being paid to mangroves, arguably the most prominent blue carbon ecosystem.

**2** **Beyond carbon sequestration, blue carbon ecosystems provide other tangible, strategic advantages** such as fish and other food products, medicines, handicrafts and tourism, besides being part of the cultural identity of local populations. The value of mangroves goes well beyond carbon: by acting as protective coastal barriers to cities, they save an estimated USD 65 billion a year in storm and flood damages.

**3** **Southeast Asia is rich in mangroves: Indonesia alone hosts over 20% of mangroves globally.** Beyond mangroves, seagrass and seaweed are emerging as key blue carbon opportunities. Indonesia's mangroves store some 3.1 billion tC<sup>1</sup> which in terms of CO<sub>2</sub> is 10% larger than China's emissions in 2018.

**4** **Deforestation, pollution, climate change and production of commodities are destroying mangroves. Almost four-fifths of mangrove losses globally occur in Southeast Asia.** Mangroves and other blue carbon ecosystems are being whittled away. For example, between 1980 and 2005, Indonesian mangrove forests were cut by 31%.

**5** **Southeast Asia is at a turning point: governments need to develop a supportive policy and regulatory framework for blue carbon.** Southeast Asian countries are moving to include blue carbon in their Nationally Determined Contributions. But prospects for increasing carbon storage in blue ecosystems and co-benefits for local communities remain hindered by sub-optimal policies, laws, regulations, capabilities.



**6 Individuals, communities and groups of people who rely directly on blue carbon ecosystems are the most vulnerable stakeholders of the blue economy.**

Ensuring inclusive participation and leadership of Indigenous Peoples and local communities (IPLCs), women, and other marginalized groups in project design, governance and management is key for them to be able to equitably participate in and benefit from the voluntary carbon market.

**7 Innovation and transformation are needed, across the board, to show that it is possible to conserve and restore blue carbon ecosystems in ways that also enrich biodiversity and benefit human well-being.**

Several areas emerge as critical spaces for innovation: blue carbon projects selection and management approaches, technological and methodological innovations supporting verification, innovations in terms of policy and regulatory frameworks, innovations in financing sources and models.

**8 Technological advances may positively disrupt this space.**

Mapping, monitoring and estimating carbon in blue ecosystems has been slow, unreliable and expensive. We are in the early stages of a monitoring and verification revolution. Satellite imagery is now cheaper and more ubiquitous, and is becoming a powerful tool that could make a difference in terms of preserving and valorizing the global mangroves heritage.

**9 Philanthropists play a critical role to demand for high quality blue carbon projects and a transformative role to foster innovation in the sector**

by funding capabilities, know-how and technologies. Working with local stakeholders, philanthropists can supply patient and risk capital, financial acumen and entrepreneurial advice to help pioneer business models delivering blue carbon and financial returns and to promote and incentivize change.

**10 Collective action opens a range of possibilities for philanthropists allowing them to achieve greater impact**

than would otherwise be the case from acting independently. Collectively, philanthropists and impact investors can collaborate to share fixed costs and improve risk management. They can coordinate work to avoid duplication, share the lessons of experience and achieve greater influence with governments.



# The UBS Climate Collective

## UBS Collectives

The world is a big place with complex problems. Even working every hour of every day, one person couldn't hope to solve the planet's challenges alone. But you can still make a big difference how and with whom you do it that makes the difference.

Imagine digging a tunnel by yourself. Not only might it take years, as you dig deeper, the work would get trickier and riskier. Now picture a group of people working together. Each has different tools and skills. Some have shovels, others have excavators. Some are engineers, others, support structure specialists. With everyone working together and playing to their strengths in a coordinated way, the team quickly breaks through to the other side.

That is what happens in a collective in philanthropy. A collective is a network of similarly focused people and organizations working together on a cause, such as fighting poverty, climate change, inequality, or inadequate healthcare and education. The members collaborate and combine their resources and skills towards solving an issue close to their hearts.

The result? A united force with the power to make the world a better place.

## Building coastal resilience to mitigate climate change – the UBS Climate Collective

Coastal ecosystems are the first line of defense against climate disasters. They soak up carbon dioxide at an extraordinary speed and provide shelter and food for more than 120 million vulnerable people in coastal communities. But, from mangrove forests to coral reefs, they are being pushed to the brink of collapse. Reversing

this trend and making the Earth more resilient to climate change are tasks where philanthropists hope to achieve a deep and lasting impact.

We need to act now, cutting our carbon dioxide emissions by half over the next ten years. The UBS Climate Collective aims to be can be part of this movement bringing together a network of philanthropists, major players and non-profit organizations to collaborate. Together, they are working to catalyze the blue carbon market to enable climate mitigation and climate resilient livelihoods for communities and smallholders living in coastal areas. The network supports coastal and marine nature-based solutions that reduce and remove carbon emissions from the atmosphere, and is building blue carbon markets worldwide, whose success will promote the rapid growth of nature-based solutions and investments in the climate. The UBS Climate Collective enables vulnerable coastal communities to adapt to climate change and create sustainable livelihoods while protecting and restoring biodiversity.

We are collaborating with others, sharing our resources, skills, and efforts to create a united and impactful response. We are starting to tackle the problem locally, developing the case for replication and scale to other countries and regions. The Collective is initially supporting and investing in projects in Southeast Asia. This region is especially vulnerable to climate change, with many people relying on subsistence agriculture and coastal ecosystems for their livelihoods and wellbeing.

But the efforts will go further. Because the Collective is creating proven climate solutions that are robust and flexible enough to grow worldwide, engaging influential people and organizations who can turn regional efforts into global success stories.



# PART I

## Opportunities and Challenges

# Blue Carbon: a significant opportunity

- **Blue carbon is the carbon circulating through the water, plants and animals of the ocean**, which cover 70% of our planet. Marine organisms capture 55% of all the carbon captured by fungi, flora and fauna worldwide.<sup>ii</sup> Over the last 50 years oceans absorbed 24-33% of human carbon emissions.<sup>iii</sup>
- In simple terms, the ocean absorbs carbon dioxide from the atmosphere and receives carbon biomass from rivers. Ocean plants, such as macroalgae, or seaweed, seagrass or mangroves, draw carbon from the water or air, releasing some back into the ocean as they grow. In death, they decay into sediments which hold carbon for hundreds of years or longer. Marine creatures eat marine plants, concentrating carbon while creating space for young marine plants to grow, absorbing more carbon.
- Blue carbon ecosystems, **including mangroves, tidal marshes and seagrass meadows** draw carbon from the atmosphere up to 10 times faster than tropical forests. Mangroves, perhaps the best studied blue carbon ecosystem, store three-to-five times more carbon per hectare than tropical forests for decades or centuries.<sup>iv</sup>
- Globally, the largest coastal blue carbon ecosystem is seagrass spanning 16.0-26.6m ha, followed by mangroves 15.2m ha, salt marshes 5.5m ha and kelp 1.5m ha.

## Understanding the Global Carbon Cycle

The volume of carbon on Earth is fixed, but its form and location change. Carbon flows around the Earth, cycling within and between the geological pool, primarily rocks of the Earth's crust, and the terrestrial pool, comprising atmospheric carbon gases, oceanic dissolved inorganic carbon and finally carbon found in life, that is fungi, flora and fauna, including humans. We can also partition carbon in the cycle in terms of biotic, or living like mangroves, and abiotic, or not living, such as rocks, stores.

A change in speed is now underway. The global carbon cycle is accelerating because humans are burning fossil fuels which took millions of years to build up, in a few centuries. We are transferring, or unlocking, carbon from the geological pool to the terrestrial pool at speeds previously only seen during exceptional volcanic eruptions or large asteroid impacts millions of years ago. The impact of humans on the global carbon cycle is an historic event without precedent. Humans have become a geological force. Thus, the modern or industrial age is now considered the beginning of the geological epoch of the Anthropocene.<sup>v</sup>



# Why Southeast Asia

- Southeast Asia is dominated by mangroves, salt marshes are mostly found at temperate and sub-arctic latitudes.<sup>vi</sup> Seagrass is more prevalent and might account for half of blue carbon's annual 1.4b tCO<sub>2</sub> mitigation potential.<sup>vii</sup>
- Indonesia hosts over 20% of mangroves globally. Beyond mangroves, seagrass and seaweed are emerging blue carbon opportunities for removals as well as feedstocks for products displacing high-carbon products like plastics. Indonesia's mangroves the world's most diverse with 92 species<sup>viii</sup>, cover the largest concentrated space in the world spanning 3.3m ha, three times greater than Mexico and five times Malaysia.<sup>ix</sup> A further 0.76m ha are suitable for mangrove restoration.<sup>x</sup> Indonesia's mangroves store some 3.1 billion tC<sup>xi</sup> which in terms of CO<sub>2</sub> is 10% larger than China's emissions in 2018.
- The annual rates at which mangroves in Southeast Asia accumulate, or sequester, carbon varies greatly. In the Mekong Delta, Vietnam, mangroves soak up 1.15-1.39 tC/ha<sup>xii</sup> (4.7 tCO<sub>2</sub>), Bali, Indonesia 1.5 tC/ha, Malaysia 5.7 tC/ha and Thailand 8.3 tC/ha (30.64 tCO<sub>2</sub>). Setting aside differences in methods, local environmental conditions control carbon storage and accumulation.<sup>xiii</sup>
- Mangroves also supply carbon to nearby seagrass meadows. In North Sulawesi, Indonesia, up to 70% of organic carbon in seagrasses came from mangroves and sediment organic carbon was 2-3 times greater than meadows far from mangroves.<sup>xiv</sup> The findings are similar to results from Malaysia. Together, mangroves and seagrasses increase blue carbon.<sup>xv</sup>
- Beyond the most tangible, easy to recognize products of blue carbon ecosystems, such as fish products, handicrafts or tourism, the potential of mangroves and seaweed to provide fibre, food and fuel - while well known among local communities - is becoming more widely understood. There are also

**Map 1 - Global distribution of Blue Carbon Ecosystems**



Source: <https://bluecarbonpartnership.org/about-blue-carbon/>



more strategic benefits: for example, carbon regulation or coastal erosion protection: the World Bank estimates erosion protection alone by mangroves in Indonesia is worth \$10,000/ha/year<sup>xvi</sup> while UNEP values mangrove ecosystem services at \$33,000-57,000/ha/year.<sup>xvii</sup>

- Rising emissions fuel rising interest in blue carbon removals. More attention is being paid to mangroves, arguably the most prominent blue carbon ecosystem. While losses

continue, gains are picking up on the back of more research and increasing awareness among stakeholders of the potential of mangroves to mitigate climate change.<sup>xviii</sup> That will continue and intensify in a world of rising emissions and accumulating consequences. The imperative for removals by blue ecosystems, and other methods, is strengthening by the day but is also facing significant challenges, discussed in the next section.

## Key challenges

- Despite all the benefits described above, deforestation, pollution, climate change and production of commodities are destroying mangroves worldwide.

### Almost four-fifths of mangrove losses globally occur in Southeast Asia

- Mangroves and other blue carbon ecosystems are being whittled away. Between 1980 and 2005, Indonesian mangrove forests were cut by 31%, faster than other major mangrove countries. Mangrove loss emits 70-210m tCO<sub>2</sub>e/year. If that ceased, Indonesian land-use emissions would fall 10-31%, or total emissions by up to 12%.<sup>xix</sup>

- The Global Mangrove Alliance reports<sup>xx</sup> demand for commodities, such as fish, shrimp, rice and palm oil, caused 47% of mangrove losses. Ensuring sustainable livelihoods for coastal communities, by promoting the adoption of sustainable shrimp-mangrove production systems, one of the priorities of several projects funded by the UBS Climate Collective, is key to reduce mangrove loss and degradation.
- Fuel, timber and environmental factors, such as pollution and changes in water quality due to human activity, account for 12% of mangrove losses. Infrastructure, urbanization and tourism another 3%, erosion and extreme weather, enhanced by climate change, caused 27 and 11% of mangroves losses

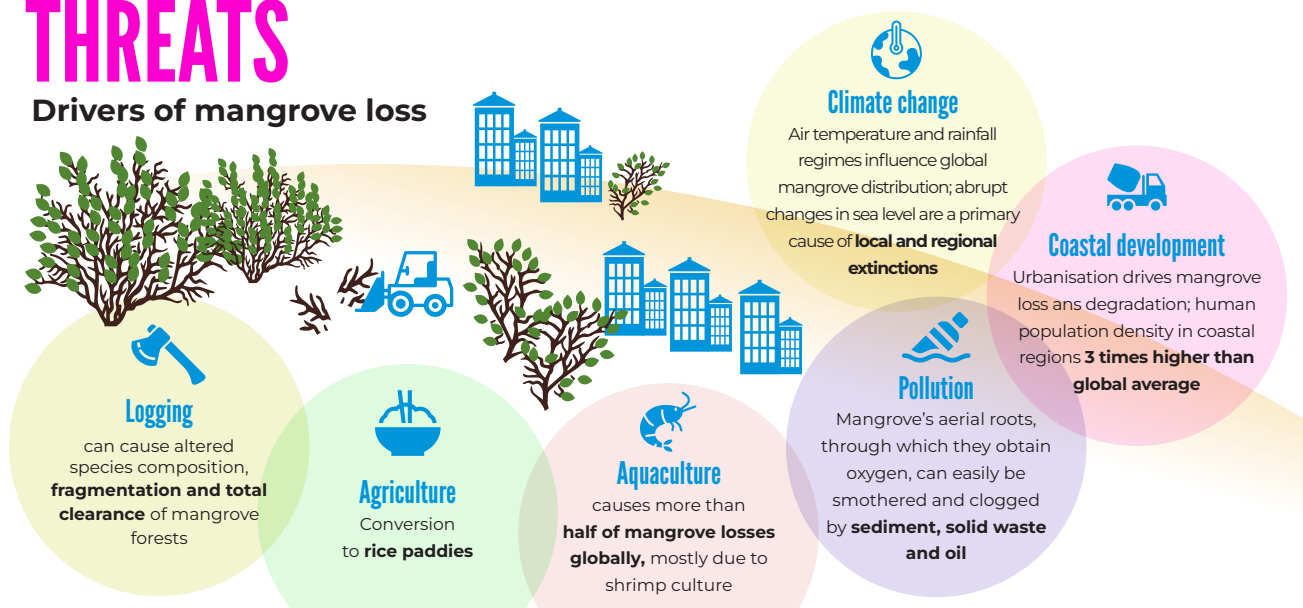
respectively. Figure 1 provides an illustration of the different types of threats to which mangroves are exposed.

- Physical and human impacts often combine to amplify rates of decline, for example in the deltas of Southeast Asia, the heart of the world's mangroves. Indonesia, Myanmar, Malaysia, the Philippines, Thailand and Vietnam account for almost 80% of global losses due to direct human activity. Mangroves in Indonesia's Kalimantan and Sulawesi, Vietnam's Mekong Delta and Myanmar's Rakhine face the gravest threats. Only 22% of mangroves are covered by protected area status.
- Blue carbon conservation faces other indirect causes of change. In addition to fueling global warming which amplifies storms, rising atmospheric levels of carbon are also causing seawater to warm<sup>xxi</sup>, acidify<sup>xxii</sup> and deoxygenate faster<sup>xxiii</sup> than would otherwise be the case. This contributes to decline in biodiversity and associated ecosystem services upon which people depend, such as provisioning of food and regulation of carbon. Rising acidity directly harms ocean organisms critical for carbon storage and food webs, such as coral, molluscs and krill. Mangroves are quite resilient, suffering only a moderate impact if acidity doubles.<sup>xxiv</sup> Corals and seagrasses appear particularly vulnerable to declining oxygen.<sup>xxv</sup>
- Drowning is a growing risk too. Large-scale submergence and death of mangroves across the Indo-Pacific might occur by 2070.<sup>xxvi</sup> Global warming is melting glaciers and ice sheets while also causing water to expand. Globally, sea level rise is accelerating, running at 3.4 mm/year in recent years compared to 1.8 mm/year during the last century. Generally, around the equator and along coasts sea level is rising faster than the global average. As sea rise intensifies and water changes, species will gradually die-off. Sea rise faster than 7 mm/year outruns sediment build up by mangroves<sup>xxvii</sup> or dead mangroves can release large volumes of methane, an especially potent greenhouse gas, in addition to carbon dioxide.<sup>xxviii</sup> Action on global environmental threats often connected to climate change (but not only) is needed to remove or mitigate these indirect causes to the deterioration of mangroves and other coastal ecosystems.
- Understanding economic and ecological challenges is hampered by weak data. Carbon stocks and flows are subject to considerable uncertainties because field assessments

Figure 1 - Drivers of Mangrove Loss

# THREATS

## Drivers of mangrove loss



Source: Based on <https://www.iucn.org/theme/marine-and-polar/our-work/climate-change-and-ocean/mangroves-and-coastal-ecosystems>

are hard, costly and inadequate.<sup>xxxix</sup> Mapping of blue carbon ecosystems is improving as new methods and funding refine and scale measurement combining satellite imagery with ground methods.<sup>xxx</sup> While satellite imagery is assisting with the mapping of these systems, geopolitical factors can prevent their use in some locations where they are perceived as a threat to National Security.



- Southeast Asian countries are moving to include blue carbon in their Nationally Determined Contributions (NDCs)<sup>xxxix</sup>, however prospects for increasing carbon storage in blue ecosystems and co-benefits for local communities remain hindered by sub-optimal policies, laws, regulations and capabilities. Supporting systemic impact is therefore critical to address the points or aspects of the system which hinder development of blue carbon. In some situations, tweaks to the system may be sufficient to clear obstacles holding back blue carbon opportunities. In other situations, it may be necessary to redesign the system, by changing or introducing new laws and regulations. Regulation is still nascent in most Southeast Asian countries and does not yet provide the adequate level of incentives and confidence to the market. In Vietnam, the legal basis for a carbon crediting scheme has been adopted in January 2022, but only proposes a phased approach up to 2028, with several legal and operational aspects that have yet to be defined (allocation of credits, etc.). In Indonesia, the legal basis for a carbon

trading scheme has been established in 2021, but the market infrastructure has yet to be established and the regulation remains unclear on certain key operational aspects, such as the transfer of ownership rights to carbon units from one party to another.

- Regulatory, social, ecological and economic challenges intersect in issues such as resource rights. Communities often lack strong titles to land and local resources in raising risk and cost for blue carbon projects. Weak legal protection opens the door to grabbing of land and ocean resources by powerful actors or damage caused by activities elsewhere.<sup>xxxii</sup> Blue carbon impact is demanding in terms of resources because of the challenges of working with Nature and the unique social situations of communities affected by impact initiatives and whose participation is crucial to success (see box at the end of this section).
- Financing of blue carbon projects is a significant challenge in Southeast Asia and globally. **Restoring green and blue ecosystems can supply one-third of the action to cap warming at 1.5 degrees but draws only 3% of global climate finance.** Despite corporate demand the supply of blue carbon credits falls short, a blip in the global voluntary carbon market.<sup>xxxiii</sup> For example, Verra, a leading accreditor for international voluntary carbon credits, recorded 10 blue carbon projects (and 23 in the project registration pipeline) on a registry of 1,829 projects, as of October 2022.<sup>xxxiv</sup> Plan Vivo, a smaller international accreditor, records two small blue carbon projects, as of June 2023, with 8 more mangrove-projects in the pipeline for accreditation.<sup>xxxv</sup>



## People and the Blue Carbon Economy



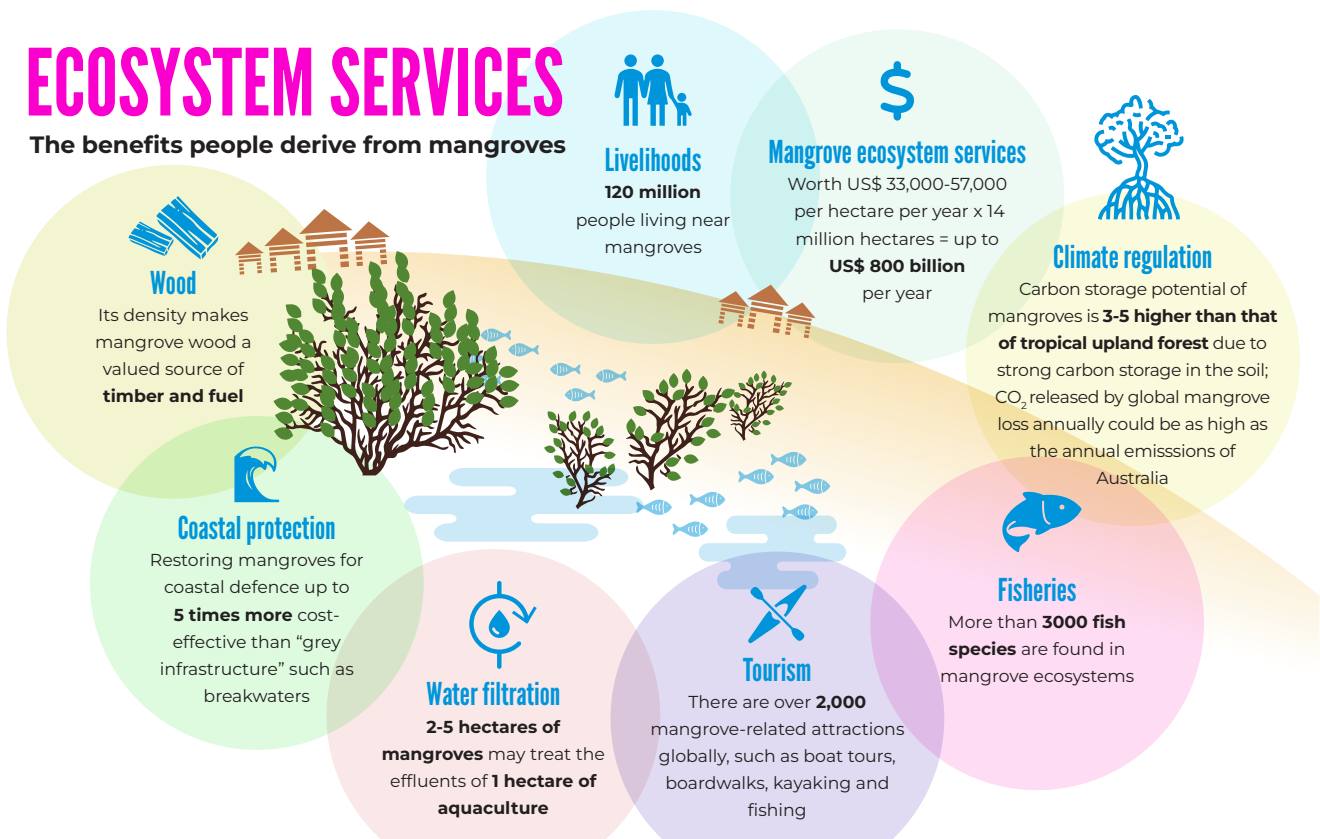
People living along the coasts often work in an economy deeply intertwined with blue carbon. Fishing is a classic example of the blue carbon economy. Some fish inhabit mangroves and seagrasses others arrive seasonally to breed. If mangroves and seagrasses are abundant and in good health there will be more fish, all else equal, for households to eat and trade. Blue carbon ecosystems also provision fuelwood, timber and ingredients of traditional medicines, regulate water quality, coastal erosion and carbon flows. Mangroves also regulate storm surges and tsunamis. Cultural value is another service of

blue carbon ecosystems. Traditional views and ways still play an important role in the relationship of many communities with blue carbon ecosystems such as mangroves. Learning and incorporating their wisdom can reduce risk and improve sustainability of blue carbon projects.

Figure 2 - Benefits Derived from Mangroves

### ECOSYSTEM SERVICES

The benefits people derive from mangroves



Source: Based on <https://www.iucn.org/theme/marine-and-polar/our-work/climate-change-and-ocean/mangroves-and-coastal-ecosystems>



# PART II

## Innovation and Good Practices

# The Need to Foster Blue Carbon Markets

- Blue carbon in Southeast Asia is at a turning point. Governments are now working out the scope and systems for implementing a transparent system for trading credits between countries, international carbon schemes and perhaps voluntary carbon markets.<sup>xxxvi</sup> Trust and confidence could rise among buyers and investors, helping markets rapidly expand to offset rising emissions.
- In this context, innovation is needed, to show that it is possible to conserve, restore

and nurture Nature in ways which also enrich biodiversity and benefit human well-being. Several areas emerge as critical spaces for innovation; at the level of blue carbon projects selection and management, technological and methodological innovations in the areas of verification, innovations in terms of policy and regulatory frameworks, and in financing sources and models.

## Ten examples of High-Impact Innovations

- At heart the blue carbon transformation is a story of innovation. This section presents 10 notable cases of innovation driven by non-profit entities often in collaboration with Government and with the support of enlightened philanthropists and impact

investors. These examples are chosen among many and are part of the current Southeast Asia Climate Collective supported by UBS Optimus Foundation in partnership with Impact46.





## Innovator: GLOBAL MANGROVE TRUST



### Challenge

#### Carbon assessment and verification

Financing mangrove conservation has proven a major pain point due to low scalability, high costs of incumbent certification regimes, high bureaucratic requirements, and high upfront development and assessment costs that nonprofits need to finance. Research

has shown that up to 80% of the carbon credit price does not reach the local communities working in the forest. Most of the money goes to expensive project developers and intermediaries that provide liquidity, monitoring, verification, and audit services.



### Approach

#### Space-based blue carbon assessment for mangrove conservation

The Global Mangroves Trust (GMT) is collaborating with private sector, tech sector, and community partners to develop and drive innovative digital MRV solutions that reduce time-to-market and key costs of blue carbon origination. GMT does so by (1) developing and testing FOREST-SCAN, a cost-effective space-based monitoring and carbon estimation tool for pre-feasibility and or feasibility stage analyses of blue carbon projects; (2) Validating FOREST-SCAN and

integrating it within the OxCarbon Standard within a series of two-stage mangrove conservation scale-ups in Aceh Province, Indonesia. Stage One involves the development of a scientific baseline forest inventory and the preparation of core governance, management, and verification cycles. Stage Two of each scale-up combines active conservation and restoration with crediting and sales, livelihood development, capacity building, and program evaluation.





## Innovator: BLUE FORESTS



### Challenge

#### Restoring and Protecting Mangroves

Indonesia has the fastest rate of mangrove destruction in the world, having lost 40% of its mangrove areas in the past three decades. Of the remaining 3.3 million hectares (ha), 1.8 million ha are degraded or at risk of continued conversion for

short-term economic development (aquaculture and oil palm plantations) as well as infrastructure development (roads, ports, coal power plants, harbors, settlements, etc.).



### Approach

#### Integrated, adaptive and collaborative mangrove management

To restore and protect mangroves and reduce emissions from ongoing deforestation and degradation, while increasing community welfare, Blue Forests works in Muna Island, Southeast Sulawesi Province (Indonesia) to:

- Increase coastal community participation in sustainable livelihood development and mangrove ecosystem rehabilitation and protection;
- Showcase direct use values and increase them through value chains;

- Advocate for payments for the protection and enhancement of ecosystem services values (blue carbon); and;
- Engage institutions in multi-stakeholder coordination and adaptive, collaborative management.

The approach applies to three focal mangrove management areas: 1) rehabilitation 2) sustainable land use, and 3) protection, underscored by good governance that includes multiple stakeholders and prioritizes gender and social inclusion.





## Innovator: WWF



### Challenge

#### Mitigating risks and enhancing the resilience of mangroves and local communities

Vietnam's Mekong Delta Landscape (MDL) has more than 77,000 hectares of mangroves which provide ecosystem services for the communities' main livelihood - integrated mangrove aquaculture and rice/shrimp cultivation. They also act as a natural buffer that protects local communities from climate change hazards such as sea level rise, prolonged flooding, and droughts. The MDL is one of the most severely impacted

areas in the world by climate change. Mangroves have been seriously degraded, weakening the resilience of the ecosystem and the local communities. Key drivers of degradation include the destruction of forests for aquaculture, solid waste pollution, upstream development, lack of sectoral collaboration on coastal zone development policy, and insufficient application and dissemination of nature-based solutions (NbS).



### Approach

#### Fostering nature-based solutions and improved mangrove-aquaculture

WWF Vietnam mitigates risks and enhances the climate resilience of the mangroves and local communities in Ca Mau and Bac Lieu provinces by: (1) improving mangrove-shrimp communities' livelihoods, establishing agroforestry pilot models with forest restoration and protection (organic shrimp farming), sediment trapping models (rice and shrimp models), as well as (2) developing Better Management Practices (BMP)

guidelines, applying for international certifications, providing technical support and training for new farmer cooperatives, and disseminating pilots. Also, the WWF approach enhances mangrove management and protection by advocating for the prioritization and mainstreaming of NbS in provincial climate change adaptation plans and establishing community-based mangrove restoration and management models in protected forests.





## Innovator: BLUE VENTURES



### Challenge

**Building local capacity to manage and govern mangroves, and generating revenue through voluntary carbon markets**

The Indonesian government has set ambitious targets to accelerate mangrove rehabilitation, including restoring over 600,000 hectares of mangrove forest by 2024. Coastal communities, as the primary users of mangroves, are best placed to lead conservation and restoration.

However pervasive challenges prevent many remote coastal communities from managing their mangroves and associated fisheries sustainably – including lack of secure tenure, weak and conflicting forest and marine governance, and the absence of viable alternative livelihoods.



### Approach

Blue Ventures is working to conserve and rehabilitate mangroves in villages across Indragiri Hilir, in Indonesia's Riau Province, by strengthening locally led mangrove conservation. Activities include community led mangrove rehabilitation of degraded forests, strengthening community-based forest management associations to manage mangroves sustainably and recover depleted fisheries.

The model strengthens local leadership and governance and provides practical tools and approaches to enable communities to manage and monitor mangrove forests and fisheries. These steps are also essential building blocks for the development community-led blue carbon projects in these carbon rich ecosystems.

## Innovator: CLIMATEWORKS CENTER



### Challenge

#### meeting Indonesia's Nationally Determined Contribution targets by 2030

Indonesia pledged an unconditional reduction of 29% of its emissions by 2030. However, a more ambitious emissions reduction of 41% by 2030 has been proposed on a conditional basis, subject to availability of international support for finance, technology transfer and development, and capacity building.

The significant emission gap between the Nationally Determined Contribution (NDC) ambitions of countries and the Paris Agreement goal of 1.5 degrees will not be bridged without the inclusion of oceans emissions and marine nature-based solutions in countries' NDCs.



### Approach

#### including in NDC and building national capacity on priority blue nature-based solutions and high potential offshore action

Climateworks Centre bridges research and action, to achieve the system-level transitions required to reach net zero emissions across Australia, Southeast Asia and the Pacific. In Indonesia, it aims at: (1) socialising decision makers with offshore mitigation and nature based blue carbon solutions via bi-annual high-level meetings to create acceptance and uptake of these measures; (2) bridging the Talent Gap in Ocean-Climate and Blue Carbon Sectors by creating a syllabus that can be embedded within Indonesian educational institutions

to upskill a pool of professionals already familiar with the blue carbon project landscape to enable them to create fundable proposals and manage projects; and, (3) further scoping activities associated with the blue carbon project ecosystem development to improve the understanding of government decision-makers, potential funders and donors on blue carbon projects in Indonesia, increase the confidence for funders and decision-makers in project investment potential.



## Innovator: CENTER FOR INTERNATIONAL FORESTRY RESEARCH (CIFOR)



### Challenge gaps in research and policy

Stakeholders involved in the development of carbon project and markets need to count on robust research and environmental frameworks. These stakeholders include government agencies, project developers, investors, nonprofits, media, and local communities. In particular, barriers faced by Vietnam in developing a forestry carbon market and, more specifically, a blue carbon market include: (1) underdeveloped legal frameworks on forest and blue carbon,

(2) limited knowledge and capacity of central and provincial government agencies, (3) difficult access to reliable data and networks for investors interested in climate-oriented funds, (4) lack of knowledge and capacity of Indigenous People and Local Communities (IPLCs), including women and youth, to take part in and benefit from blue carbon market and, (5) the disconnect between local initiatives and projects and national policy discussions.



### Approach advancing knowledge, capacity, and policy around forests to develop a blue carbon policy framework

CIFOR Vietnam aims to build knowledge at national and sub-national levels, which, in turn, will lead the Government of Vietnam and respective stakeholder groups to create transformative partnerships, innovative financing mechanisms, inclusive and evidence-based decision-making processes, and equitable access to benefits for indigenous people, local communities, women, and youth. It will do so by: (1) supporting the Government

of Vietnam to develop its legal framework, policies and guidelines for a high quality-high integrity blue carbon market, (2) equipping government agencies, private sector and IPLCs with information, tools, analysis, capacity, and networks to develop and implement high-quality blue carbon policies and projects and, (3) establishing a country-level Blue Carbon Finance Facility to facilitate connections between investors and equitable blue carbon investment opportunities.





**Innovator: INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN)**



## **Challenge** **Carbon verification**

The Mekong Delta is home to 70% of Vietnam's mangroves. Fed by sediment and nutrients from the Mekong River, these habitats support the rich fishing grounds; however, they are under threat. The delta's mangrove forests are declining by up to 50 meters per year as a result of the coastal squeeze, in which mangroves

are trapped between rising sea levels and sea dikes. A poor understanding of the problem, conflicting political priorities, and urgency may lead to the adoption of ineffective, high-cost approaches involving sluice gates, sea dikes, and other hard infrastructure.

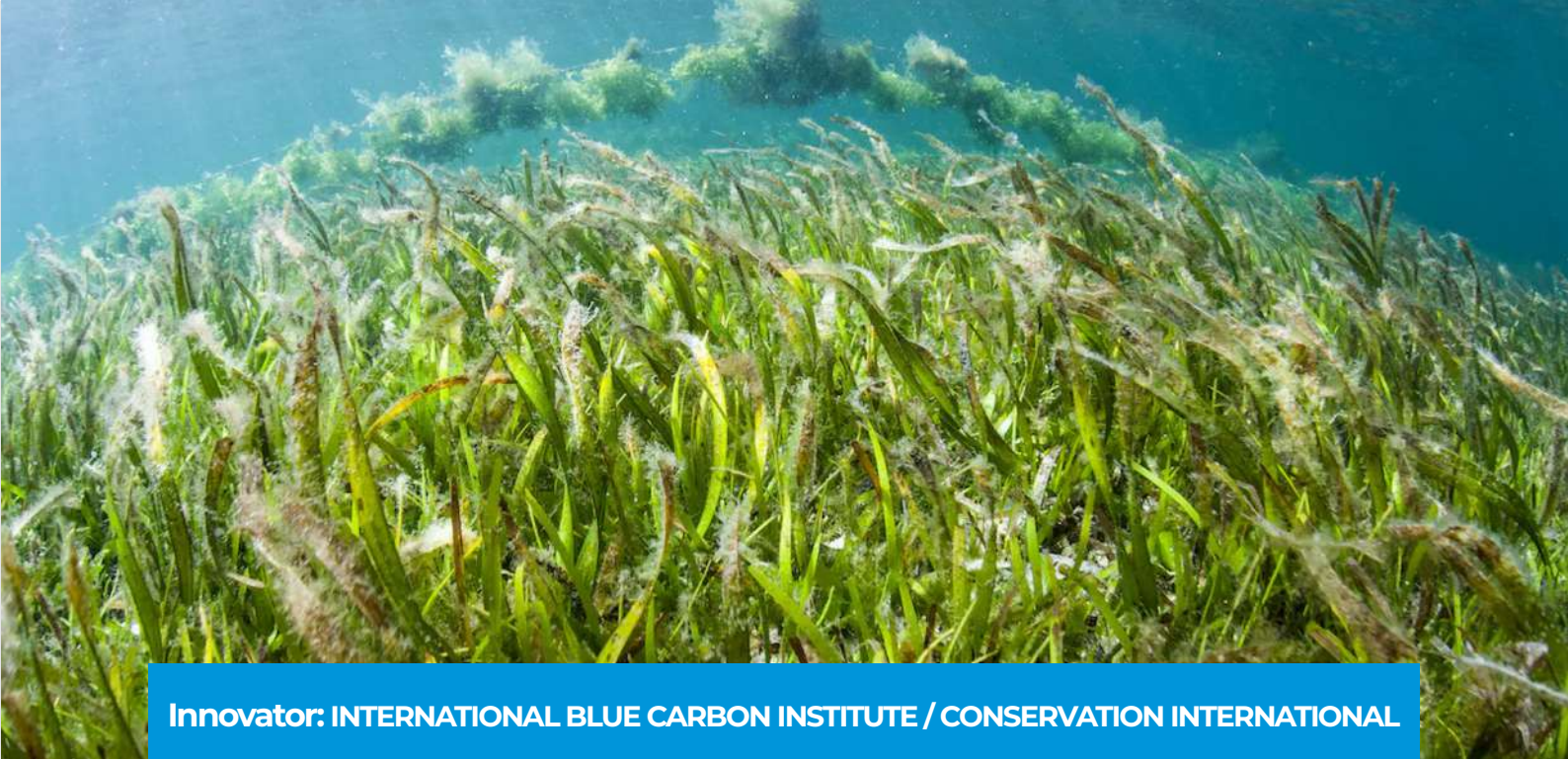


## **Approach** **Advocating for nature-based solutions to address the coastal squeeze**

The new approach to coastal planning includes hybrid Nature-based Solutions (NbS) within the context of private land use. Transforming these coastlines and addressing the coastal squeeze is achieved by: (1) generating knowledge needed for evidence-based policy advocacy on coastal squeeze, (2) improving the understanding and building the capacity of provincial

and local governments, business owners, and households on the feasibility and implementation of NbS as a solution to the coastal squeeze, and (3) engaging in high-level dialogues with the government and businesses to embrace NbS and incorporate them into national and provincial policies and programs.





**Innovator: INTERNATIONAL BLUE CARBON INSTITUTE / CONSERVATION INTERNATIONAL**



## Challenge

**lack of coordination, alignment and communication among blue carbon stakeholders**

An increasing number of countries are including blue carbon mitigation and adaptation in their national commitments to the Paris Climate Agreement. Despite the increase in global commitment to scale and accelerate impact for climate, communities and biodiversity, there is a general lack in coordination, alignment and communication among blue carbon stakeholders preventing the

efficient action, project development and implementation. Besides this, there is a lack of new science, methodologies and tools needed for blue carbon policy and project development and a bigger portfolio of case studies to guide and accelerate implementation. Also, the sector has a severe shortage of capacity to design and implement blue carbon projects and programs.



## Approach

The International Blue Carbon Institute aims to accelerate and scale the application of blue carbon globally through multi-disciplinary capacity-building, targeted scientific research and tool development and by building a blue carbon global

network of practitioners. It will do so by: (1) developing a Global Blue Carbon Network, (2) developing and deploying innovations in blue carbon science and knowledge, and (3) building capacity in blue carbon across diverse disciplines.



## Innovator: FOREST CARBON



### Challenge

Protecting mangroves, marine diversity, and seagrass

In Indonesia, the Misool area in Raja Ampat is one of the most biodiverse of all blue carbon ecosystems in the world and its natural and social capital value are both at risk and in need of recognition by environmental markets.

Currently, there is no funding for the protection of mangroves and seagrass in the Misool marine area, and funding for the private Marine Protected Area has dropped significantly with the decline in ecotourism due to the pandemic.



### Approach

Developing payment for ecosystem services

Forest Carbon aims to build a more financially resilient ecosystem protection program for targeted areas of Southern Raja Ampat (Indonesia) by tapping into the payment for ecosystem services and blue carbon markets. This is achieved in three phases:

- (1) Conducting feasibility studies and developing a business model;
- (2) Piloting early-stage mangrove and seagrass activities and collecting data in preparation for the development of a commercial project;
- (3) Securing a working payment for ecosystem services model.





## Innovator: EARTH SECURITY



### Challenge

#### Scaling Investments for mangrove conservation

It is essential that the regions across the world that concentrate the highest share of mangroves adopt scalable, mangrove-positive business models. There are over 700,000 hectares of restorable potential

for mangroves globally. It is estimated that the investment needed to fully restore mangroves on this global scale is USD 11.2 billion over a 20-year period.



### Approach

The Mangrove 40 initiative (M40), led by a Earth Security, seeks to define a price benchmark and innovative financial mechanisms to rapidly scale investments for mangrove conservation and restoration projects across 40 regions of the world that encompass over 70% of the remaining mangrove ecosystems. One of the main intended outcomes of this initiative, that

has a strong focus on Indonesia, is to develop a global price benchmark for 'high-quality' blue carbon. This price will not only reflect the carbon sequestration potential of mangroves but will also incorporate local benefits on coastal defence/asset protection, aquaculture, tourism and other sectors and services.



# PART III

## A Framework for Action

# Four Areas for Philanthropy

- In Southeast Asia, governments, enterprises, and communities have often limited know-how, capabilities and finance to drive the necessary innovation for the emergence of a blue carbon economy.
- In this context, as evidenced by the experience of the ongoing UBS Climate Collective, philanthropists can play a critical and transformative role funding capabilities, know-how and technologies to foster innovation in the sector. Working with local stakeholders, philanthropists can help by supplying risk capital, financial acumen and entrepreneurial advice to help pioneer business models delivering blue carbon and financial returns.
- Funding innovations includes acting in one or more of the following 4 key areas:



## (1) Sourcing

identifying and vetting what works for blue carbon in terms of new solutions, approaches, models and technologies.



## (2) Funding

taking on the financial and reputational risk to support solutions that are still not proven.



## (3) Sharing

sharing the lessons and experience for others to learn, evolve, replicate and improve existing approaches.



## (4) Advocating

pressing public and private stakeholders by advocating for changes in policy or regulations.





## Lessons learnt so far

A few lessons for philanthropists interested in blue carbon can be drawn from the ongoing experience in Southeast Asia of the Climate Collective supported by UBS Optimus Foundation.

- **Adopting the right impact time horizon.**

In general, systemic or direct initiatives will require multiple years (three-to-five years, and possibly longer) for activities to produce impact. This longer time horizon is necessary because of the complexity and scale of blue carbon opportunities. To endure after funding ends, systemic or direct impact initiatives must leave a legacy of capabilities, including the ability to generate ongoing funding from commercial or other sources.

- **Taking (calculated) risks.** Pursuing blue carbon impact initiatives exposes philanthropists to a wide range of risks, including operational, partner, design, policy and reputational risks. Philanthropists and impact investors should be realistic about the possibility of failure and loss given the combination of complex physical and social challenges with new technologies and business models presented by blue carbon projects. This said, it is precisely the role of

philanthropy to take some risks to foster progress in this area.

- **Indirect strategies are here to stay.**

Action in several countries demonstrates the effectiveness of indirect strategies to deliver carbon impact by non-carbon means. Leveraging markets for established commercial products can be faster and simpler than a direct strategy focusing on carbon. Direct strategies producing carbon credits are subject to regulation, and the pace and direction of national and international policy is a source of uncertainty that can raise the risk premium. Whereas initiatives delivering carbon as a co-benefit of say shrimp, fish or tourism in general face fewer regulatory challenges and can count on stronger local support.

- **Co-benefits and local support are key.**

Solutions require scale to deliver enduring results and scale is the product of actions by local communities, who are more likely to participate if their needs are recognized and wisdom respected.<sup>xxxvii</sup> If co-benefits promise tangible results people are more likely to engage. Planning nature-based solutions should therefore give at least equal weight to

co-benefits and blue carbon.<sup>xxxviii</sup> Indeed, while it might be necessary to focus on blue carbon to mobilize finance, new approaches focused on co-benefits are important for mobilizing action on the ground which results in carbon removal impact.

- **Blue carbon mitigation and co-benefits income must exceed alternatives,** such as shrimp ponds, or make them part of the solution, e.g. by promoting sustainable aquaculture systems. Solutions must convince investors of impact and local communities that their interests are protected.
- **Measuring both carbon and co-benefits is key.** To maximize interest and secure superior prices blue carbon projects must prepare to empirically document and clearly communicate carbon as well as co-benefits impact. A holistic approach to defining and measuring impact is important because of the implications for structure and cost of capital financing blue carbon initiatives.
- **Blue carbon initiatives require great care.** The mixed record of REDD+<sup>xxxix</sup> schemes illustrates the potential of good intentions to go awry. Local people can lose rights and livelihoods as the logic of property rights introduces new forms of regulation and enclosure overriding traditional concepts of property and ecological understanding and interaction.<sup>xl</sup> Such outcomes are largely avoidable.
- **Technologies are improving carbon assessments, site selection and bringing project costs down.** Increasing transparency and trust is needed and now possible leveraging ever better imagery from satellites and drones combined with sharper methods, enhanced by AI, improving carbon verification accuracy and slashing the management and carbon-verification costs.
- **Innovation can help expand financing.** This may entail blending private and public sources and accepting the overhead costs each imposes in terms of reporting. Innovative financial mechanisms are being tested and scaled. For example, crowd-funding mangroves via online platforms connects donations to mangroves with geotags and photos. Examples include “mangrove adoption” in Java and “crowdplanting” in Sumatra. Municipal mangrove bonds are under preparation in Australia and could be deployed in Southeast Asia to develop mangroves as an alternative to grey infrastructure for erosion, flooding and carbon mitigation. These are only a few examples of innovations that could expand public financing in Southeast Asia.
- **Investing in knowledge management/ sharing.** To improve readiness and seed conditions for accelerating the blue carbon economy it is necessary to upgrade policy, regulation, business and skills based on good practices. Good practices are transformative if they are duly codified and shared. Capturing, crystallizing and communicating knowledge is thus key. Knowledge must be accessible to all stakeholders, including those with limited literacy, numeracy or command of official languages. Knowledge in English should aim for simplicity and avoid jargon to ensure accessibility across the region.
- **Pilots must be scaled and reflected in policy.** A lot of experiments of different value are ongoing across Southeast Asia. Given the scale of blue carbon opportunities and the world’s growing need to accelerate blue carbon impact, replication and scaling are critical. It is essential for philanthropy to adequately support ways in which good practices are codified and governments can be inspired and recognize the potential of nature-based solutions in more favorable policy and regulatory frameworks.

# The case for collective action

- Unlike other sectors (like education or healthcare) blue carbon is not a space with readily available, proven solutions. Funding in this area is comparatively riskier than in other areas. It thus makes sense to pool funds to de-risk, to accelerate learning and to increase the capacity to influence policies and markets.
- 
- Collectively, philanthropists can collaborate to share fixed costs, improve risk management and coordinate interests and resources to scale blue carbon impact returns. Collective action spans a range of possibilities for philanthropists to work together to achieve greater impact than would otherwise be the case from acting independently.
- 
- For example, philanthropists can simply coordinate work to avoid duplication and share knowledge and experience. Collectives can also collaborate with specialists to innovate new instruments.
- 
- A clear framework for collective action also helps other parties decide if they want to collaborate. Collective action produces scale which generates attention and creates gravity, drawing additional partners from public, private and philanthropic sectors.
- 
- Collectives may also achieve greater influence, get more done and face less policy risk. For example, a collective philanthropic endeavour is more likely to draw consistent support of governments and communities plus a sympathetic ear for policy reforms to improve systems.
- 
- In Asia, collective action on blue carbon is a new concept that can help advance the development of a blue carbon market and inspire action by philanthropists in other sectors.

# Bibliography

- <sup>i</sup> World Bank (2021) Mangrove Conservation and Restoration: Protecting Indonesia's "Climate Guardians" <https://www.worldbank.org/en/news/feature/2021/07/26/mangrove-conservation-and-restoration-protecting-indonesia-climate-guardians>
- <sup>ii</sup> Nelleman, C. et al (eds) (2009) Blue carbon: the role of healthy oceans in binding carbon | Arendal: UNEP
- <sup>iii</sup> Laffoley, D. et al (eds) (2017) An introduction to ocean acidification: What it is, what we know, and what may happen | Gland: IUCN
- <sup>iv</sup> NOAA (2022) Blue Carbon | [coast.noaa.gov/states/fast-facts/blue-carbon.html](https://coast.noaa.gov/states/fast-facts/blue-carbon.html)
- <sup>v</sup> Lelieveld, J. (2021) Paul J. Crutzen (1933–2021): Ozone Nobel prizewinner who coined the term Anthropocene | Nature [doi.org/10.1038/d41586-021-00479-0](https://doi.org/10.1038/d41586-021-00479-0)
- <sup>vi</sup> Pendleton et al (2012) Estimating Global "Blue Carbon" Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems | PLoS One [doi.org/10.1371/journal.pone.0043542](https://doi.org/10.1371/journal.pone.0043542)
- <sup>vii</sup> Jones, N. (2021) Why the Market for 'Blue Carbon' Credits May Be Poised to Take Off | Yale Environment360 <https://e360.yale.edu/features/why-the-market-for-blue-carbon-credits-may-be-poised-to-take-off>
- <sup>viii</sup> World Bank (2021) Mangrove Conservation and Restoration: Protecting Indonesia's "Climate Guardians" <https://www.worldbank.org/en/news/feature/2021/07/26/mangrove-conservation-and-restoration-protecting-indonesia-climate-guardians>
- <sup>ix</sup> Murdiyarso, D. et al (2016) The potential of Indonesian mangrove forests for global climate change mitigation | Nature Climate Change [doi.org/10.1038/NCLIMATE2734](https://doi.org/10.1038/NCLIMATE2734)
- <sup>x</sup> KLHK (2021) Peta Mangrove Nasional Tahun 2021: Baseline Pengelolaan Rehabilitasi Mangrove Nasional | Jakarta: Ministry of Environment and Forestry (KLHK)
- <sup>xi</sup> World Bank (2021) Mangrove Conservation and Restoration: Protecting Indonesia's "Climate Guardians" <https://www.worldbank.org/en/news/feature/2021/07/26/mangrove-conservation-and-restoration-protecting-indonesia-climate-guardians>
- <sup>xii</sup> Ahmed, N., Thompson, S., & Glaser, M. (2018) Integrated mangrove-shrimp cultivation: Potential for blue carbon sequestration | Ambio [doi.org/10.1007/s13280-017-0946-2](https://doi.org/10.1007/s13280-017-0946-2)
- <sup>xiii</sup> Kusumaningtyas, M. et al (2022) Carbon sequestration potential in the rehabilitated mangroves of Indonesia | Ecological Research [doi.org/10.1111/1440-1703.12279](https://doi.org/10.1111/1440-1703.12279)
- <sup>xiv</sup> Chen, G. et al (2017) Mangroves as a major source of soil carbon storage in adjacent seagrass meadows | Nature Scientific Reports [doi.org/10.1038/srep42406](https://doi.org/10.1038/srep42406)
- <sup>xv</sup> Hidayah, N. et al (2022) Macroalgae and mangrove provenances demonstrate their relevance in contributing to the blue carbon pool of a tropical seagrass meadow | Ecological Research [doi.org/10.1111/1440-1703.12273](https://doi.org/10.1111/1440-1703.12273)
- <sup>xvi</sup> Rodrigues de Aquino, R. (2022) Indonesia Mangroves for Coastal Resilience Project (P178009): Project Information Document (PIDA32941) | Washington, D.C.: The World Bank
- <sup>xvii</sup> van Bochove, J. et al (eds) (2014) The importance of mangroves to people: A call to action | Cambridge: United Nations Environment Programme World Conservation Monitoring Centre
- <sup>xviii</sup> Spalding, M. & Leal, M. (eds) (2021) The State of the World's Mangroves 2021 | Global Mangrove Alliance
- <sup>xix</sup> Murdiyarso, D. et al (2016) The potential of Indonesian mangrove forests for global climate change mitigation | Nature Climate Change [doi.org/10.1038/NCLIMATE2734](https://doi.org/10.1038/NCLIMATE2734)

- <sup>xx</sup> Spalding, M. & Leal, M. (eds) (2021) *The State of the World's Mangroves 2021* | Global Mangrove Alliance
- <sup>xxi</sup> Laffoley, D. & Baxter, J. (2019) *Ocean deoxygenation: everyone's problem: Causes, impacts, consequences and solutions - Summary for policymakers* | Gland: IUCN
- <sup>xxii</sup> Laffoley, D. et al (eds) (2017) *An introduction to ocean acidification: What it is, what we know, and what may happen* | Gland: IUCN
- <sup>xxiii</sup> Laffoley, D. & Baxter, J. (2019) *Ocean deoxygenation: everyone's problem: Causes, impacts, consequences and solutions - Summary for policymakers* | Gland: IUCN
- <sup>xxiv</sup> Laffoley, D. et al (eds) (2017) *An introduction to ocean acidification: What it is, what we know, and what may happen* | Gland: IUCN
- <sup>xxv</sup> Laffoley, D. & Baxter, J. (2019) *Ocean deoxygenation: everyone's problem: Causes, impacts, consequences and solutions - Summary for policymakers* | Gland: IUCN
- <sup>xxvi</sup> Lovelock, C. (2015) *The vulnerability of Indo-Pacific mangrove forests to sea-level rise* | Nature doi.org/10.1038/nature15538
- <sup>xxvii</sup> Saintilan, N. et al (2020) *Thresholds of mangrove survival under rapid sea level rise* | Science doi.org/10.1126/science.aba2656
- <sup>xxviii</sup> Voiland, A. (2022) *Measuring Methane in the Everglades* | <https://earthobservatory.nasa.gov/images/149788/measuring-methane-in-the-everglades>
- <sup>xxix</sup> Pendleton et al (2012) *Estimating Global "Blue Carbon" Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems* | PLoS One doi.org/10.1371/journal.pone.0043542
- <sup>xxx</sup> McKenzie, L. et al (2020) *The global distribution of seagrass meadows* | Environmental Research Letters doi.org/10.1088/1748-9326/ab7d06
- <sup>xxxi</sup> Nationally Determined Contributions, or NDCs, are countries' self-defined national climate pledges under the Paris Agreement, detailing what they will do to help meet the global goal to pursue 1.5°C, adapt to climate impacts and ensure sufficient finance to support these efforts.
- <sup>xxxii</sup> Inforial (2022) *Blue Carbon Ecosystem Governance in Indonesia: Threats & Opportunities* | Jakarta Post <http://www.thejakartapost.com/adv/2022/01/26/blue-carbon-ecosystem-governance-in-indonesia-threats-opportunities.html>
- <sup>xxxiii</sup> WEF (2021) *Blue Carbon Challenge* | <https://uplink.weforum.org/uplink/s/uplink-issue/a002o0000134ftr/blue-carbon-challenge>
- <sup>xxxiv</sup> Verra (2022) <https://registry.verra.org/app/search/VCS/All%20Projects>
- <sup>xxxv</sup> Plan Vivo (2023) <https://www.planvivo.org/news/our-statement-on-blue-carbon>
- <sup>xxxvi</sup> IISD (2021) *The Paris Agreement's New Article 6 Rules* | <https://www.iisd.org/articles/paris-agreement-article-6-rules>
- <sup>xxxvii</sup> IUCN (2020) *Ensuring effective Nature-based Solutions* | Gland: IUCN
- <sup>xxxviii</sup> Siman, K. et al (2021) *Nature-based Solutions for Climate Mitigation: Challenges and Opportunities for the ASEAN Region* | British High Commission and the COP26 Universities Network
- <sup>xxxix</sup> 'REDD' stands for 'Reducing emissions from deforestation and forest degradation in developing countries. The '+' stands for additional forest-related activities that protect the climate, namely sustainable management of forests and the conservation and enhancement of forest carbon stocks.
- <sup>xl</sup> Freeman, S. (2015) *Environmental Conservation and Development: Critical Perspectives* | International Encyclopaedia of the Social & Behavioral Sciences, 2nd edition, Volume 7 doi.org/10.1016/B978-0-08-097086-8.64128-4



# IMPACT46

Powered by **UBS Optimus Foundation** and the **UBS Climate Collective**

UBS Optimus  
Foundation



Copyright © 2023