

Commissioned by



HIGH LEVEL PANEL for
**A SUSTAINABLE
OCEAN ECONOMY**

BLUE PAPER

Ocean Finance: Financing the Transition to a Sustainable Ocean Economy

LEAD AUTHORS

U. Rashid Sumaila, Melissa Walsh, Kelly Hoareau and Anthony Cox

CONTRIBUTING AUTHORS

Patrícia Abdallah, Wisdom Akpalu, Zuzy Anna, Dominique Benzaken, Beatrice Crona, Timothy Fitzgerald, Louise Heaps, Katia Karousakis, Glenn-Marie Lange, Amanda Leland, Dana Miller, Karen Sack, Durreen Shahnaz, Louise Teh, Torsten Thiele, Niels Vestergaard, Nobuyuki Yagi and Junjie Zhang

About the High Level Panel for a Sustainable Ocean Economy

The High Level Panel for a Sustainable Ocean Economy (Ocean Panel) is a unique initiative by 14 world leaders who are building momentum for a sustainable ocean economy in which effective protection, sustainable production and equitable prosperity go hand in hand. By enhancing humanity's relationship with the ocean, bridging ocean health and wealth, working with diverse stakeholders and harnessing the latest knowledge, the Ocean Panel aims to facilitate a better, more resilient future for people and the planet.

Established in September 2018, the Ocean Panel has been working with government, business, financial institutions, the science community and civil society to catalyse and scale bold, pragmatic solutions across policy, governance, technology and finance to ultimately develop an action agenda for transitioning to a sustainable ocean economy. Co-chaired by Norway and Palau, the Ocean Panel is the only ocean policy body made up of serving world leaders with the authority needed to trigger, amplify and accelerate action worldwide for ocean priorities. The Ocean Panel comprises members from Australia, Canada, Chile, Fiji, Ghana, Indonesia, Jamaica, Japan, Kenya, Mexico, Namibia, Norway, Palau and Portugal and is supported by the UN Secretary-General's Special Envoy for the Ocean.

The Ocean Panel's approach is both ambitious and practical. Collaborative partnerships are essential to converting knowledge into action. To develop a common understanding of what a sustainable ocean economy looks like, the Ocean Panel gathers input from a wide array of stakeholders, including an Expert Group and an Advisory Network. The Secretariat, based at World Resources Institute, assists with analytical work, communications and stakeholder engagement.

In the spirit of achieving the UN Sustainable Development Goals (SDGs), providing value to the UN Decade of Ocean Science for Sustainable Development and meeting the objectives of the Paris Agreement, the Ocean Panel commissioned a comprehensive assessment of ocean science and knowledge that has significant policy relevance. This includes a series of 16 Blue Papers and various Special Reports that offer a synthesis of knowledge, new thinking and perspectives, and opportunities for action. This body of work is informing a new ocean narrative in the forthcoming *Towards a Sustainable Ocean Economy* report. Together, this research and new narrative serve as inputs to the Ocean Panel's deliberations for its forthcoming action agenda. Ultimately, these papers are an independent input to the Ocean Panel process and do not necessarily represent the thinking of the Ocean Panel, Sherpas or Secretariat.

Suggested Citation: Sumaila, U.R., M. Walsh, K. Hoareau, A. Cox, et al. 2020. *Ocean Finance: Financing the Transition to a Sustainable Ocean Economy*. Washington, DC: World Resources Institute. www.oceanpanel.org/blue-papers/ocean-finance-financing-transition-sustainable-ocean-economy.

Table of Contents

Foreword.....	1
Highlights	2
1. Introduction.....	3
2. Research Methodology	5
3. Current Barriers and Challenges to a SOE	6
4. Opportunities for Action.....	11
5. Conclusions	21
Appendix A: Definitions of Sustainable Ocean Economy and Blue Economy ...	22
Appendix B: The MPA Financing Gap	23
Appendix C: The Types and Sources of Capital for Financing a SOE.....	24
Appendix D: Threats to the Ocean Economy.....	25
Endnotes	26
Abbreviations.....	31
Acknowledgements	32
About the Authors	33

Foreword

The High Level Panel for a Sustainable Ocean Economy (Ocean Panel) commissioned us, the co-chairs of the Ocean Panel Expert Group, to produce a series of Blue Papers to explore pressing challenges at the nexus of the ocean and the economy to ultimately inform a new ocean report and the Ocean Panel's action agenda. The Ocean Panel identified 16 specific topics for which it sought a synthesis of knowledge and opportunities for action. In response, we convened 16 teams of global experts—over 200 authors from nearly 50 countries—who reviewed and analysed the latest knowledge. They then provided new thinking and perspectives on how technology, policy, governance and finance can be applied to catalyse a more sustainable and prosperous relationship with the ocean. In short, these Special Reports and Blue Papers provide the information needed to transition to a sustainable ocean economy.

The Expert Group, a global group of over 70 experts, is tasked with helping to ensure the high quality and intellectual integrity of the Ocean Panel's work. All Blue Papers are subject to a rigorous and independent peer-review process. The arguments, findings and opportunities for action represent the views of the authors. The launches of these papers, which are taking place between November 2019 and October 2020, create opportunities for exchange and dialogue between political leaders, policymakers, the financial community, business leaders, the scientific community and civil society.

The ocean economy is currently at risk from multiple stressors, ranging from overextraction, direct habitat damage, pollution, and climate change. Continuing with a 'business-as-usual' trajectory poses great risks to the health and integrity of the ocean and therefore to the world's population. New forms of finance are already playing a substantive role in underpinning sustainable project development and are an essential part of the emerging blue finance 'ecosystem'. In a world economically recovering from COVID-19, redirecting mainstream finance to more sustainable development pathways will drive forward the scale of positive change that is needed.

We are delighted to share the latest in the Blue Paper series, Ocean Finance: Financing the Transition to a Sustainable Ocean Economy, as it examines how the next generation of financing mechanisms can support the transition to a sustainable ocean economy in an inclusive manner and how catalytic funds can be mobilised to finance that transition. This paper demonstrates the role insurance can play in accelerating the transition and how ocean-related subsidies contribute to or detract from the sustainable ocean economy. The paper identifies approaches to be phased out and new solutions that incentivise sustainable ocean management.

As co-chairs of the Expert Group, we are excited to share this paper and wish to warmly thank the authors, the reviewers and the Secretariat for supporting this research. We are also grateful for the vision of the Ocean Panel members in commissioning this important body of work. We hope they and other parties act on the opportunities identified in this paper.



Hon. Jane Lubchenco, Ph.D.
Oregon State University



Professor Peter Haugan, Ph.D.
Institute of Marine Research, Norway



Hon. Mari Elka Pangestu, Ph.D.
University of Indonesia

Highlights

- The ocean economy is currently at risk from multiple stressors, ranging from overextraction, direct habitat damage, pollution and climate change. Continuing with this 'business-as-usual' trajectory poses great risks to the health and integrity of the ocean and therefore to the world's population.
- Ocean finance can play a critical role in changing this trajectory and helping to achieve a sustainable ocean economy (SOE).
- However, current investments fall well below what is needed to transition to a SOE. In the last 10 years, less than 1 percent (US \$13 billion) of the total value of the ocean has been invested in sustainable projects through philanthropy and official development assistance.
- Of the public and private sector investments already committed, a significant proportion are targeted at larger-scale economic activities that are often unsustainable and counter to the delivery of Sustainable Development Goal 14.
- To achieve a SOE, this sustainable finance gap needs to be closed. To close the gap, improved SOE policies, incentives, tools and approaches will need to be designed and established, knowledge and innovations proactively shared and capacities built to address environmental, social and economic risks, mobilise new forms of finance and redirect mainstream finance towards a SOE that empowers local people and supports responsible business and long-term societal goals.
- Several barriers are preventing the growth in financing of the SOE. Capacity constraints, data challenges, regulatory gaps and a lack of transparency all create a riskier enabling environment and negatively affect large-scale private sector finance. Most notably, complicated tenure and ownership and a lack of monitoring and enforcement increase the risk profile.
- Projects lack the appropriate deal size and risk-return ratios to match capital, making scaling and replication more complex than in familiar terrestrial sectors. There is a lack of familiarity with ocean-based project development and financing by both the business and finance sectors. Capacity gaps, particularly in developing countries, exist regarding how to access sustainable ocean finance.
- This paper finds that many potential actions can be taken by the private and public sectors to remove existing barriers and open the pipeline to investment in a SOE.
- The paper proposes priority opportunities for action to remove existing barriers and open the pipeline to investment into a sustainable ocean economy, including:
 - Adopt clear principles to redirect mainstream finance towards a SOE.
 - Create a supportive and inclusive enabling environment.
 - Proactively strengthen and scale up the pipeline of investible projects.
 - Explore new financing mechanisms and tools.
- Achieving a robust ocean finance supportive of a SOE requires that the public and private sectors create and better mobilise a full suite of financial tools and approaches, insurance, and fiscal and market incentives as well as strengthen key aspects of the enabling environment. These actions will support the transition to an ocean economy that is sustainable and inclusive by making the benefits it generates available to all, especially women, youth and marginalised communities.

1. Introduction

The ocean covers more than 70 percent of Earth's surface and plays a crucial role in providing ecosystem goods and services that sustain life and support the well-being of billions of people worldwide (Teh and Sumaila 2013; FAO 2018; Hoegh-Guldberg et al. 2019; IPBES 2019). The ocean holds many economic opportunities, and many experts are recognising the need for a coordinated and sustainable approach to its use. Ocean finance can play a vital role in supporting sustainable development of the ocean economy by directing investments to sustainable development pathways that minimise ocean risks and maximise social equity, human well-being and environmental health.

The objective of this Blue Paper is to (i) inform about the inadequacy of the current financing of the sustainable ocean economy (SOE), (ii) synthesise the barriers and challenges in financing the SOE and (iii) propose concrete solutions to overcome these barriers.

Although a globally accepted definition of a SOE is still not agreed upon—with many organisations and entities providing varying definitions (see Appendix A)—refer to the SOE here as: 'development of the ocean economy in a way that balances the needs of people, planet and prosperity'. This is amplified by Winther et al. (2020) as ensuring 'long-term, sustainable use of ocean resources in ways that preserve the health and resilience of marine ecosystems and improve livelihoods and jobs, balancing protection and prosperity'. The size of the ocean economy is valued at an estimated 2.5 percent of global gross value added and is growing rapidly. In 2010, prior to the COVID-19 pandemic, the Organisation for Economic Co-operation and Development (OECD) projected that the estimated US\$1.5 trillion in global gross value added of ocean industries—including fishing, shipping, offshore wind, maritime and coastal tourism and marine biotechnology—would increase to \$3.0 trillion by 2030 (OECD 2016). Hoegh-Guldberg et al. (2015) concluded that if the ocean were a country, it would rank seventh in the world in terms of gross

domestic product (GDP). This translates into significant contributions to national economies, generating millions of jobs in many countries. Note, however, that many valuations do not account for the ocean's full range of ecosystem goods and services, such as cultural and social values. In order to avoid undervaluation, ocean ecosystems must be valued as critical natural capital that underpins the vast public goods and ecosystem services they provide (Fenichel et al. 2020).

It is highly likely that COVID-19 will negatively impact this estimate (OECD n.d.), especially for the shipbuilding and tourism sectors of the ocean economy. However, the net effect of COVID-19 is not a given since governments worldwide are spending billions on short-term measures to prop up their economies in the face of the pandemic (Vivid Economics 2020).

The ocean economy is currently at risk from multiple stressors, ranging from overextraction, direct habitat damage, pollution and climate change (Hernández-Delgado 2015; Gaines et al. 2019; IPBES 2019; IPCC 2019). Continuing with this 'business-as-usual' trajectory poses great risks to the health and integrity of the ocean and therefore to the world's population, especially the future well-being of hundreds of millions of people in coastal and island communities. These risks undermine the 2030 Agenda for Sustainable Development and, in particular, the Sustainable Development Goals (SDGs) focused on 'life below water' (SDG 14) as well as others, including 'no poverty' (SDG 1), 'zero hunger' (SDG 2), 'decent work and economic growth' (SDG 8) and 'climate action' (SDG 13) (Wright et al. 2017). To change this trajectory, it is imperative to build ocean resilience and minimise ocean risks by restoring, protecting and effectively managing human use of and impacts to ocean ecosystems. Nevertheless, the bulk of investments in the ocean economy have been directed not at transitioning to a SOE but rather at large-scale infrastructure, energy, transport, commercial fisheries, aquaculture, biotechnology and tourism (Vivid Economics 2020).

Figure 1. A Major Gap in Ocean Finance for Supporting a Sustainable Ocean Economy



Note: All figures are in US\$; ODA = official development assistance.
Source: Authors. Designed by Patricia Tiffany Angkiriwang.

The costs for not conserving and sustainably using the ocean are high. For instance, invasive species are estimated to cause \$100 billion in economic damages to infrastructure, ecosystems and livelihoods each year (OECD 2017a). The total estimated cost of coastal protection, relocation of people and loss of land to sea level rise is projected to range from about \$200 billion to \$1 trillion annually by 2100, depending on the increase in sea level (0.5–1.0 metres). Already, it appears that a 1-metre sea level rise is more than likely by the turn of the century (IPCC 2019). Noone et al. (2013) state that in the absence of proactive measures to mitigate climate change, the cost of damage to the ocean could be an additional \$322 billion a year by 2050. The 2019 *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* (IPCC 2019) and Gaines et al. (2019) both report significant impacts of climate change on the ocean economy.

Despite the huge costs of inaction and the substantive investments in the ocean economy, current levels of investments in the ‘sustainable’ ocean economy

are inadequate (Figure 1). Although an estimated \$8 billion from philanthropy and \$5 billion from official development assistance (ODA) were invested during the last 10 years (de Vos and Hart 2020), this level is insufficient to drive the change needed to achieve a SOE. Most significantly, there is limited finance available to achieve the restoration, protection and sustainable management of the ocean—to ensure the building blocks for achieving a SOE are in place (Figure 1). Evidence from the general conservation finance literature indicates that the ocean finance gap is most likely very high. Huwyler et al. (2014) estimated the gap in conservation finance across all major biomes at \$300 billion globally, though the proportion of this relevant to the ocean has not been identified and the financing needs of the SOE extend significantly beyond conservation objectives. Furthermore, it has been estimated that to achieve the global need for conservation funding, investible cash flows from conservation projects need to be at least 20–30 times greater than they are today. Sumaila et al. (2017) report that currently about 0.002 percent of global GDP is invested in conserving and sustainably using biodiversity, and about 4 times the current level of investment is required to meet conservation needs. Although these estimates are for biodiversity in general, the available data suggest inadequate investments in ocean sustainability. We provide a detailed description of current funding gaps for marine protected areas (MPAs) in Appendix B.

The reasons for the low levels of sustainable financing and investment in SDG 14 and the SOE are manifold, and if addressed, they could result in real and sustained change in the way our ocean ecosystems are utilised and managed. These issues are discussed in this Blue Paper. Section 2 summarises the study method, Section 3 provides evidence of current challenges to financing and investing in a SOE, Section 4 discusses opportunities for actions that can be taken to overcome these challenges and Section 5 concludes.

2. Research Methodology

The methodology consists of reviewing the literature to identify what information is currently available on finance flows for the conservation and sustainable use of the ocean; understanding existing fiscal instruments and financing options, including insurance; and identifying opportunities for how these instruments for a SOE can be scaled up. Available data is compiled from various sources, and key data gaps are highlighted. Examples are used to illustrate good practice. We review and analyze the literature on the use of fiscal instruments to support ocean economic activities and governance. We specifically query the literature to help us understand the types of subsidies, fees and taxes currently applied to the ocean economic sector at different scales and ocean economic activity types, and we analyse how

these can be re-designed and re-directed to make them support a SOE. We also review current practices of the insurance industry and ask pertinent questions, such as does insurance as currently practiced support the goal of promoting a SOE? What role could insurance have in accelerating the transition towards a new ocean economy? Finally, we review the literature on ocean risk and resilience in the context of the wider discussions about climate risks to identify how insurance products can best help to deliver ocean and coastal finance solutions. Since an important aim of this Blue Paper is to provide the most current information possible, we also rely on the expert knowledge of contributing authors about recent and ongoing initiatives to address current challenges and barriers to financing a SOE.

3. Current Barriers and Challenges to a SOE

Several root causes can explain the current low levels of sustainable financing and investment in a SOE (Figure 2).

3.1. Inadequate Frameworks and Taxonomies

Current frameworks and taxonomies to guide which investments support a SOE—that is, ‘blue’ investments—do not adequately communicate with each other and are not yet being guided by universally adopted principles. This is necessary to establish a classification system of activities that are considered to comply with the principles of a SOE, thereby guiding investment decisions and development policy towards a SOE. Efforts towards common frameworks and taxonomies are under way (ADB 2020), with several notable examples outlined below.

3.1.1. The sustainable blue economy finance principles

The European Commission, the World Wide Fund for Nature (WWF), the European Investment Bank and the Prince of Wales’ International Sustainability Unit developed the Sustainable Blue Economy Finance Principles (WWF 2018). Designed to build on and complement existing sets of principles for sustainable finance, such as the Equator Principles, these 14 principles aim to fill the current gaps associated with a SOE. If widely adopted, the principles could help to positively transform the way in which ocean ecosystems are used and managed.

3.1.2. The United Nations Environment Programme finance initiative

The United Nations Environment Programme (UNEP) recently launched the Sustainable Blue Economy Finance Initiative, a platform targeted at the finance, investment and insurance sectors (UNEP n.d.). Adopting

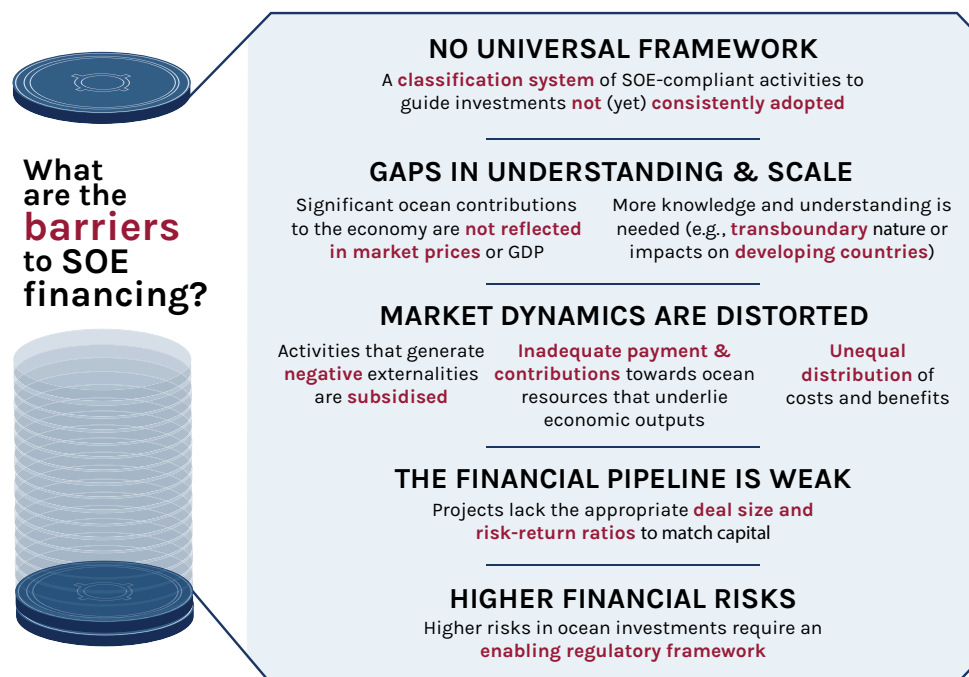
the Sustainable Blue Economy Finance Principles as a guiding framework provides practical information on SOE issues and will support the development of more granular guidance. UNEP works with financial institutions to incorporate environmental, social and governance (ESG) issues into their business principles and to integrate sustainability principles into financial market practices. This is done through frameworks such as the Principles for Sustainable Insurance (PSI), the Principles for Responsible Banking and the Principles for Responsible Investment. Other complementary sectoral principles include the Principles for Investment in Sustainable Wild-Caught Fisheries (EDF et al. 2018) and the Poseidon Principles (Poseidon Principles 2019) aimed at the shipping sector.

3.1.3. The European Union taxonomy

The European Union (EU) taxonomy (European Commission 2020)—which includes a blue component—is the first to develop such a framework. It is likely that this taxonomy will significantly influence the creation of a common global taxonomy, which will be required to standardise decision-making across global markets and support the delivery of a SOE. Complementary frameworks are being developed by institutions such as multilateral development banks to guide the screening and selection of ocean investments by defining the sectors, segments and objectives that are allowable. Notably, the Asian Development Bank (ADB) framework also stipulates rules to help reduce ‘blue-washing’ (ADB 2020).

To design guidance that is both ambitious and pragmatic, strong collaboration between a range of actors from the science, policy, non-governmental organisation (NGO) and finance communities will be critical.

Figure 2. Barriers to Marshalling Adequate Funding for a SOE



Note: GDP = gross domestic product; SOE = sustainable ocean economy.
Source: Authors. Designed by Patricia Tiffany Angkiriwang.

3.2. Gaps and Mismatches in Information, Awareness, Capacity and Scale

3.2.1. Inadequate information and awareness

Information about the ocean and its economic, social and environmental value is missing or inadequate. For appropriate and adequate finance to flow into the ocean economy, its overall contribution needs to be understood and measured more comprehensively than it is currently. Notably, humans derive multiple ecosystem services from the ocean whose values are generally not reflected in market prices and are therefore barely captured within the GDP. These include ecosystem services such as those linked to cultural values and benefits as well as natural hazard protection, carbon sequestration and climate mitigation and pollution buffering (OECD 2017a). The values of these services can be extremely high. For instance, Rogers et al. (2014) estimated the carbon sequestration value of marine life

in the high seas to be 10 times the revenue generated by high seas fish catch.

3.2.2. Mismatched capacity and scale

Ocean finance systems do not yet have adequate capability to match the governance needs of a shared global ocean. Therefore, another prerequisite for finance to catalyse the transition to a SOE is the availability of comprehensive information about the shared and transboundary nature of the ocean. The ocean is ecologically and physically connected across the entire globe, and impacts to the ocean and marine ecosystem services in areas beyond national jurisdiction (ABNJ)—the high seas (Sala et al. 2013), for instance—can have large impacts on marine resources within exclusive economic zones, and vice versa (White and Costello 2014; Sumaila et al. 2015; Popova et al. 2019). Large pelagic stocks, for example, cross the boundaries of several countries, and financing schemes that take this into account are necessary for ensuring that the ocean economy is sustainable.

Table 1. Examples of Regional Collaboration in Sustainable Ocean Governance

GEOGRAPHICAL REGION	SUSTAINABLE OCEAN INITIATIVE/STRATEGY
Africa	African Union's Blue Economy Strategy United Nations Economic Commission for Africa's Blue Economy Regional Action Plan
Asia	Asia Development Bank's Action Plan for Healthy Oceans and Sustainable Blue Economies. Indonesia's Sustainable Oceans Programme
Baltic Sea	Baltic Sea Initiative
Europe	European Union's Blue Growth Strategy
Indian Ocean	Indian Ocean Rim Association's Blue Economy Declaration
Pacific Ocean	Pacific Regional Oceanscape Program

Source: Authors.

Given the large scales and complex connectivity of ocean systems, managing ocean resources requires regional and global initiatives. A cooperative approach for maritime security (including climate change and illegal activities), trade and investment, and transboundary ocean resource management (including consideration of ABNJ) are critical to achieving sustainable ocean/blue economy outcomes. While regional sustainable ocean strategies are being developed (Table 1), these initiatives need to cover ocean basins currently overlooked by working better together. Ocean financing is needed that matches the scales of these large and complex ocean governance initiatives. The ongoing negotiations at the United Nations (UN) on the governance of ABNJ may result in new regimes for governing these areas and impact the kind of financing instruments that would be needed.

3.3. The Market Dynamics Are Distorted

3.3.1. Fiscal policies undermine a SOE

Ocean economic activities that generate negative externalities, such as fossil energy extraction, unsustainable fishing and aquaculture and non-green shipping (i.e., vessels that are not eco-friendly [Lee and Nam 2017]), receive subsidies. Fossil fuel support measures in the ocean economy are common and are in place in most countries (OECD 2019b). The International Monetary Fund estimates that 6.3 percent of global GDP

(\$4.7 trillion) was provided as fossil fuel subsidies in 2015 (Figure 1), including uninternalized externalities (Coady et al. 2019). About \$35 billion in subsidies is allocated to global marine fisheries alone each year, of which \$22 billion is allotted to harmful subsidies (Sumaila et al. 2019). According to OECD estimates, governments spend on average an amount equal to 20 percent of the value of fisheries landings in support of the sector, amounting to \$7 billion per year in the OECD region and reaching an estimated \$35 billion worldwide. These harmful fisheries subsidies prop up fishing operations which would otherwise be unprofitable, thereby facilitating excessive fishing capacity which perpetuates the overexploitation of fisheries resources (Sumaila et al. 2019).

A large percentage of fisheries subsidies are currently allocated to large-scale industrial fishing fleets (Schuhbauer et al. 2017), which can make small-scale fishing fleets less economically viable (Schuhbauer and Sumaila 2016). Given the important food security, livelihoods and cultural roles that small-scale fisheries play worldwide (Österblom et al. 2020), public policies should not proactively disadvantage them if the aim is to meet the SDGs, especially SDGs 1–5 and 10 ('no poverty', 'zero hunger', 'good health and well-being', 'quality education', 'gender equality', and 'reduced inequality'). In particular, because relatively more women are small-scale than large-scale fishers (Harper et al. 2020), everything being equal, eliminating and/or redirecting harmful subsidies could improve gender equality

by empowering female fishers. This is because most harmful fisheries subsidies go to large-scale fisheries, but women work proportionately more in small-scale fisheries (Harper et al. 2020). Certain subsidy policies, particularly those related to fuel use, also have the potential to disproportionately encourage large fishing operations to increase effort, thereby reducing the catches, food and livelihood opportunities available to small-scale fishers (Martini and Innes 2018).

3.3.2. Beneficiaries do not adequately pay for access or management of ocean resources

Maritime countries are generating large economic outputs from the ocean economy, but the cost of ocean management is currently not being borne by those exploiting it, including direct harvesters and consumers. Consequently, there is underfunding of effective ocean governance and reviving and maintaining the health and integrity of ocean ecosystems required to sustain the ocean's economic outputs. Although comprehensive economic outputs are not always fully measured and accounted for, or may not be considered at all (e.g., support for emerging sectors), current figures available indicate that in Australia, the ocean economy is valued at 4.3 percent of the GDP (AIMS 2018). In Mauritius, the ocean economy accounts for over 10 percent of GDP. In China, the ocean economy accounts for nearly 10 percent of GDP and is rising steadily (EDB 2020). The fishing sector alone is worth 10 percent of the GDP in the Pacific Islands region, and this does not include all of the other ocean sectors. In East Asian countries, the ocean economy accounts for 15–20 percent of GDP (PEMSEA 2009). In the United States, the ocean economy is growing twice as fast as the U.S. economy as a whole (NOAA 2019). Despite the significance of the ocean economy to maritime countries and to the global economy, public investments to ensure that the ocean economy is sustainable are inadequate. For instance, Binet et al. (2015) estimated that Mediterranean countries were facing an annual financing gap of \$776.4 million for effective management of marine protected areas in the Mediterranean (Appendix B).

The private sector also benefits from, as well as impacts, the ocean, but it generally does not contribute sufficiently to investments or initiatives that could improve the sustainability of the ocean economy.

Recognising the need to diversify funding sources and increase blending, the 2015 Financing for Development conference in Addis Ababa encouraged the use of different streams of funding to meet global challenges and the SDGs. 'Turning billions into trillions' requires mobilizing private finance alongside public capital to achieve sustainable outcomes. However, the scale of current financial flows is insufficient mainly because private finance is constrained by risk-return requirements (Appendix C), and the volume of public sector and philanthropic finance is inherently limited.

3.3.3. An unequal distribution of costs and benefits

Access to ocean finance is limited and not well understood by potential recipients, especially in developing countries. Österblom et al. (2020) found that ocean resources and sectors are 'rarely equitably distributed', and many of their benefits are captured by a few. At the same time, most of the costs from ocean-based economic activities, such as the environmental impacts from pollution, are borne by women, youth and marginalised communities. Women are particularly disadvantaged because they face inequity worldwide (Österblom et al. 2020). Further, the lack of enabling conditions in many developing countries means that access to finance is more limited to begin with, and it is not always fully understood by potential recipients.

The inequity identified by Österblom et al. (2020) results from the provision of subsidies to the fossil fuel sector to the tune of \$4.7 trillion globally, or 6.3 percent of global GDP, in 2015 (Coady et al. 2019). Such subsidies to big business only serve to increase inequality, which ultimately leads to the unfair distribution of ocean economic values and benefits to small-scale actors, women and minority groups (Österblom et al. 2020). Clearly, existing inequalities need to be solved so that the ocean economy can help reduce these inequities around the world. Österblom et al. (2020) make the important argument that promoting equity, both within and between countries, is integral to a SOE. Equitably allocating ocean finance to all groups in society (including women and minority groups) is a necessary, if not sufficient, condition for tackling inequality in the ocean economy. New innovative and inclusive investments that are fair and accessible to all members of society are needed.

The potential impacts of expanding the SOE in developing countries are not well captured. Economic inequality between nations has resulted in divergent progress in ocean activities, and this has affected millions of people worldwide who depend on the ocean for their livelihoods and culture. For example, seabed mining and fishing activities financed with capital from a range of countries affect the well-being of people in the developing world when they target, for instance, migratory fish stocks as well as stocks shared with developing countries (Jouffray et al. 2020). It is important that the impacts of these activities at all scales are studied and understood in order to provide the information base to ensure that finance, subsidies and insurance are designed to avoid supporting activities with negative impacts on people and nature.

The available data are too aggregated in existing national accounts and need to be disaggregated more, but this is not an easy task (Fenichel et al. 2020). The current effort by the UN System for Environmental Economic Accounting, which provides a standardised framework to account for environmental protection and management expenditure (and taxes or subsidies) in a manner that is interoperable, is a good effort that needs to be expanded to include ocean finance information more comprehensively (Fenichel et al. 2020). Similarly, the recently established Global Ocean Accounts Partnership has yet to include ocean financial flows in its framework for ocean accounting and capacity-building activities (UN ESCAP n.d.).

3.4. The Investment Pipeline Is Weak

3.4.1. Limited availability of high-quality, investible projects

Although there is no shortage of investment capital available globally, the immediate lack of high-quality, investible projects that would contribute to a SOE is a substantial challenge (Koh et al. 2012; UN-OHRLLS 2013; PEMSEA 2015; Fritsch 2020). The majority of sustainable ocean interventions currently require grant capital and do not generate sufficient, if any, financial returns. For the minority of projects that do benefit the ocean and generate a financial return, many are (i) too small to be financially viable once the costs of due diligence are considered and/or (ii) too high in the risk-return

profile (see more on ocean risk in Section 3.5). This is exacerbated by the fact that many sustainable ocean interventions have low potential economic returns (see Appendix C). The good news, however, is that there is a growing number of ocean-focused start-up companies.¹

3.5. High Risks without an Enabling Regulatory Environment

3.5.1. Environmental complexities, untested interventions, and patchy regulatory and governance frameworks

Historically, ocean economic sectors have operated under relatively more unpredictable conditions than those based on land due to the ocean's vast size, physical environment, and comparative lack of ownership and responsibility in the ocean. For instance, the fluid and interconnected nature of the sea means that pollutants and alien species can be carried across much greater distances than on land, thus creating unanticipated impacts in far-off places. Likewise, because water is less transparent than air, remote sensing technology is unable to penetrate deep down to the sea's surface, thereby making it a lot more difficult and expensive to understand what is occurring in the seabed and water column. To overcome the higher risk profile associated with the ocean environment and attract investments and new forms of finance, a number of challenging enabling conditions will need to be addressed. These include capacity constraints, data challenges and higher-risk operating and governance environments. In addition, structural challenges related to investment in the ocean make scale and replication more complex than in more familiar terrestrial sectors (notably, related to tenure and ownership, monitoring and enforcement). To attract large-scale investments, it is critical to find ways to de-risk the enabling environment associated with ocean-based sustainable development projects and activities. De-risking would help catalyse and catapult hundreds of promising sustainable ocean ventures that are already in development globally. The majority of these projects are still in their very early days, are small and are hampered by high risk levels that conventional venture capital investors are unwilling to take.

4. Opportunities for Action

Here, we suggest a number of ways and means by which the challenges and barriers identified can be removed through actions by governments, private entities and individuals.

4.1. Set Up and Implement New (Shared) Rules, Guardrails and Guidelines

To guide investment decisions and develop SOE policies, it is critical that effective guardrails and guidelines are in place and are widely adopted. An essential element of this emerging SOE finance ecosystem will also be the creation of ocean-based finance taxonomies, which, in effect, will create classification systems of those activities considered to comply with strong principles for a SOE. The definition of a SOE as the ‘development of the ocean economy in a way that balances the needs of people, planet and prosperity’ is a good working definition that could be adopted more widely in developing such guidelines. Ultimately, the goal should be to ensure that existing frameworks and guidelines bridge and speak to each other and identify commonalities and differences that exist between them. Finally, it is very important to make sure that the frameworks developed are actually implemented.

New standards and metrics need to be developed to encourage and support stronger transparency and consistent reporting across the SOE finance community. Adequate governance, tracking and monitoring of flows, as well as principles and policy frameworks, are needed to ensure that innovative financial mechanisms support the scaling up of blended finance and private funds that are effectively aligned with inclusive and sustainable development.

The Sustainable Blue Economy Finance Principles are a strong set of scientifically and economically sound principles, and wider adoption by private and public entities should be encouraged. The principles are very high level and, therefore, are relevant across many contexts. However, due to the high-level nature of the

principles, more detailed guidance and common blue taxonomies are still needed. The EU taxonomy can provide an important first step in creating a common global taxonomy.

The Task Force on Climate-related Financial Disclosures (TCFD) is a private sector-led task force that provides a standardised disclosure framework so that carbon-related assets and climate risks can be better assessed and decisions better informed. Within an ocean context, the disclosure framework can help minimise unanticipated impacts arising from climate change, such as financial losses to coastal real estate and infrastructure resulting from sea level rise. With strong endorsement and leadership, in particular from central banks, uptake has already been high, with 1,068 supporters as of February 2020 and a market capitalization of over \$12 trillion (TCFD 2020). Building on the success of the TCFD, dialogue is now ongoing around the potential to extend this approach to the risks associated with the loss of nature through a new Task Force for Nature-related Disclosures. These tools will need to align with science and the post-2020 framework on biodiversity.

4.2. Strengthen Knowledge, Data and Capacity in Ocean Health and Finance

This will allow decision-making processes and activities to adapt to new knowledge of the potential risks, cumulative impacts and opportunities associated with business activities. Moreover, information on the status of the natural asset being invested in is required for meeting rigorous criteria during a project’s due diligence phase and throughout its life cycle. Consequently, strengthening knowledge is especially pertinent in developing countries, where data and information gaps are key challenges to attracting finance for investments, such as for fisheries reform (Holmes et al. 2014).

At the national level, investing in a coordinated research and development framework is a way to leverage funds

and expertise to grow knowledge and human capital and to advance ‘blue’ technology for ocean sustainability. For instance, Australia’s Blue Economy Cooperative Research Centre brings together government, public and private enterprises in the aquaculture and renewable energy sectors to develop sustainable offshore technologies to increase Australia’s food and renewable energy production. A central focus is investment in higher education and research to increase knowledge and human capital to enable further engagement in a SOE.

SDG 17 on ‘means of implementation’ identifies targets and indicators that can be used to track financial flows for sustainable development. These are broad but nonetheless applicable to a SOE: (i) increasing domestic resource mobilisation, including through international support to developing countries to increase capacity for tax and revenue raising (17.1); (ii) mobilising additional financial resources for developing countries from multiple sources (17.3); (iii) assisting developing countries to attain long-term debt sustainability (17.4); and (iv) achieving the target of 0.7 percent of gross national income to developing countries as ODA.

A recent tracking tool launched in 2019 by the Our Ocean conference, which also records monetary commitments to ocean conservation and sustainability, is beginning to fill this need (Our Ocean 2019). The OECD is developing estimates of financial support provided to the SOE, especially with respect to the role of ODA and blended finance in supporting sustainable ocean activities, and the finance flowing from the use of economic instruments (such as fees, taxes and charges). Finally, the philanthropic- and grant-funding tracker FundingtheOcean.org is seeking to shed greater light on the size of this source of finance.

Efforts should be made to more consistently and comprehensively monitor and report on finance for the conservation and sustainable use of the ocean, across both the public and private sectors. These efforts should involve better tracking and monitoring of financial flows for biodiversity, which cover finance for both terrestrial and ocean ecosystems (OECD 2019a). Countries should—individually and regionally—invest in data and analysis more generally. Government budgets need to be able to track spending on ocean-based sustainable development. Developing ocean data architecture at sufficient granularity will support adaptive management

to assist with ocean health and social equity and will help private investors have sufficient information to make key investment decisions. It will also help local entrepreneurs and support good business plans and practices.

National ocean accounts are a major sub-component of the data infrastructure required. The integration of environmental and economic information through a sequence of ocean accounts is one means of improving the data situation highlighted here. For example, the time series of financial flows can be correlated with ecosystem changes within an integrated national accounting framework (Fenichel et al. 2020).

4.3. Strengthen the Enabling Environment, Increase Inclusivity and Correct Market Distortions

4.3.1. Strengthen the enabling environment

Effective and stable regulatory and policy environments will do a better job of attracting investment. To maintain and potentially increase the flow of economic benefits from the ocean economy, governments need to continuously provide a supportive enabling environment. Governments and multilateral agencies have critical roles to play, therefore, in creating attractive financing conditions by reforming policies and creating regulations that strengthen the sustainable management and governance of natural capital and facilitate and incentivise social enterprise and new forms of capital (UNDP and GEF 2012; J.P. Morgan and GIIN 2014; Whisnant and Reyes 2015). This might include national policies that secure tenure and establish robust enforcement mechanisms in the fishing sector (FAO 2013) or that support technology transfer and incentivise renewable energy (Thiele and Gerber 2017; IRENA 2018). Ocean policymakers and managers should provide greater clarity regarding their policy objectives and approaches and maintain a high level of transparency and consultation with stakeholders at all levels.

Investing in improving and streamlining policies—such as those related to (i) transitioning shipping to become more green; (ii) building renewable energy infrastructure; (iii) nature-based solutions, such as the effective protection of habitats and ecosystems

(e.g., coral reefs and mangroves) that provide essential ecosystem services (including coastal protection and carbon sequestration); (iv) supporting multi-sectoral collaboration; and (v) the implementation of marine spatial planning to reduce user conflicts and ensure that cumulative impacts of activities do not exceed the carrying capacity of the ecosystem—would be an excellent way to improve the enabling environment.

4.3.2. Increase inclusivity

Given the importance of small and medium enterprises (SMEs) to portfolio development, governments should also create conditions that provide access to financing, savings, micro-insurance and other services (Grace and van Anrooy 2019). Sovereign insurance products can also substantially improve the risk profile of projects. Improved disaster and shock-related insurance, such as the Caribbean Catastrophe Risk Insurance Facility, is also critical to strengthen private investor confidence.

Other factors limiting ocean finance include the lack of intermediation capacity and transition capital. Capacity building, training and tertiary education needs to support leaders, managers and local entrepreneurs who can speak both the language of finance and the language of ocean science. National and international organisations can build the capacities in support of sustainable ocean finance through information provision, training and networking.

Building the kind of information needed to attract investments into the ocean economy requires a significant increase in human capacity for acquiring, investing and aligning ocean finance in many developing maritime countries. Effective capacity building in the areas of ocean finance, insurance and the application of fiscal instruments—especially from the international community, such as multilateral organisations or bilateral aid—is urgently needed to support investment for a SOE.

4.3.3. Correct market distortions

A resilient ocean economy requires rigorous and comprehensive ocean governance, which is not cheap and therefore needs continuous funding. A greater proportion of ocean economic output needs to be allocated to multi-sector and multinational ocean governance strategies. In addition, market distortions

need to be corrected through taxation, the pricing of services and the re-purposing of harmful subsidies to more sustainable and equitable uses.

The mechanisms by which countries could capture such revenue will vary according to the country context and include a combination of domestic taxes, levies, fines, fees and other mechanisms that monetize ocean benefits and ocean impacts. Once collected, these funds could be allocated, in a transparent way to multi-sector ocean governance strategies and marine spatial plans, including management of all significant threats and impacts to ocean health (Appendix D) as determined by the country.

Fiscal (e.g., subsidies, fees and taxes) and non-fiscal (e.g., tradable permits and social norms) incentives should also be deployed to ensure that the effects of negative externalities are eliminated while those of positive externalities are promoted. Environmentally or socially harmful subsidies could be diverted to support the move to renewable energy or related sectors such as sustainable aquaculture (Figure 3).

Market-based incentives, such as certification, can increase the investment potential for projects by providing some assurances on sustainability throughout the supply chain and implementing more transparent monitoring approaches (Lubchenco et al. 2016). Governments again have a role to play in creating stronger incentives for certification, whilst the conservation and development sector will need to provide technical assistance. A key challenge for these products is their accessibility to developing countries. The costs of certification schemes, for instance, are usually high enough to make them out of reach for many developing countries. Also, the reporting requirements for these products may be too demanding for many countries, thereby limiting the ability to scale them up globally.

Environmental fiscal reform (i.e., taxation and pricing measures that can raise revenues while furthering environmental goals [OECD 2006]) provides an opportunity to align public and private incentives in the ocean economy. It is also a mechanism to share the wealth of ocean resources more broadly in society. The imposition of taxes, levies and fees on ocean economic activities, in combination with proper management

measures— which may include assigning rights to or limiting access appropriately to these resources—can generate revenues to help bring about a SOE.

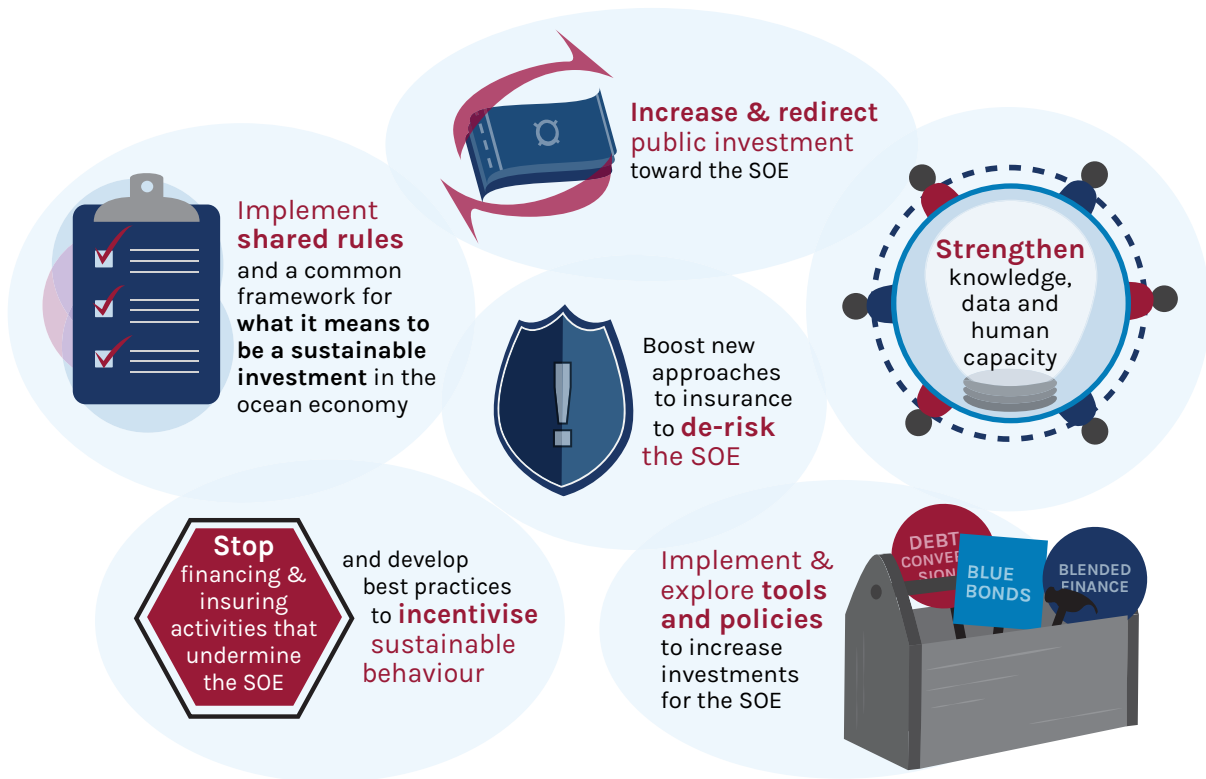
Auctions for access to ocean resources can help measure their value and generate funds to use for sustainable management and for the benefits of communities at large. The vessel day scheme of the Parties to the Nauru Agreement provides an example whereby vessel days are pooled and then auctioned to distant fishing nations. This ensures that the owners receive the full value of these ocean resources from users. Auctions need to consider community, customary and indigenous rights—for example, by reserving quotas for indigenous or local fishing communities or by establishing license banks and funding mechanisms for community fishing associations (Sumaila 2010).

Existing funds can also be used more wisely. Redirecting harmful subsidies to beneficial uses is an opportunity to catalyse a SOE and improve gender and other equalities (Österblom et al. 2020). For example, international negotiations and mandates, such as the Asia-Pacific Economic Cooperation, the Group of Twenty, SDG 14.6, the World Trade Organization negotiations and the Group of Seven, have called repeatedly to phase out inefficient fuel subsidies and distortive support measures (OECD 2018). This momentum for reform can be channeled into better policies for a SOE.

4.4. Stimulate the Pipeline of Investible Sustainable Projects

Some recent studies estimate the potential economic benefits of transition investments (e.g., WWF 2019) and find that the return on investments can be high (Sumaila

Figure 3. Examples of Opportunities for Action by the Private and Public Sectors in Support of a SOE



*Note: SOE = sustainable ocean economy.
Source: Authors. Designed by Patricia Tiffany Angkiriwang.*

et al. 2012; Costello et al. 2016; World Bank 2017; Waldron et al. 2020). This opens the opportunity for finance to capture future economic gains in exchange for helping to pay for and smooth the transition. It is unlikely that a single financial transaction or institution will be responsible for bringing a green shipping business or fishery all the way through the policy reform process to environmental and economic sustainability. Yet a variety of mechanisms can blend early stage grant funding and concessional finance from philanthropic organisations and development finance institutions with later-stage capital from the private sector (EDF and Nicholas Institute for Environmental Policy Solutions 2018).

Investments into these kinds of SOE tools and approaches should be considered to be an essential part of any business or nation's risk-reduction and resilience-building plan. In particular, large-scale sustainable—and, more importantly, natural—ocean and coastal infrastructure spending must become a priority to address climate adaptation and build the resilience of the ocean to cumulative impacts. The Energy Sector Management Assistance Program, funded by the World Bank and the governments of World Bank Group members, helps low- and middle-income countries develop environmentally sustainable energy solutions, including offshore wind energy. Importantly, it does this by focusing on addressing poverty and knowledge-creation needs. The private sector can also play a key role in delivering sustainable coastal infrastructure at a local scale. For example, Swimsol, a company based in Europe, set up the first floating solar panels in the Maldives. It achieves a 3–8 percent rate of return from its investment by engaging in a long-term power purchasing agreement with its clients (either hotels or utilities). Both parties benefit from this agreement because Swimsol's solar power is 10–50 percent cheaper than its clients' current power generation costs, which are based on diesel generators.²

Efforts to deliver debt, equity and grants to key initiatives—including finance for the implementation of the high seas or ABNJ agreements currently being developed by the UN, the next phase of delivery on SDG 14 and the Decade of Ocean Science for Sustainable Development—would be achieved through the broad adoption of a common implementation framework and guidance that aligns with the Sustainable Blue Economy

Finance Principles. In this regard, the Ocean Financing Initiative spearheaded by the ADB supports Asia-Pacific countries in developing bankable investments needed to meet SDG 14.

International institutions, such as the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization; the Food and Agriculture Organization of the United Nations; the United Nations Development Programme; UNEP; the OECD; and the United Nations Economic Commission for Africa, as well as international NGOs and others, also have a role in clearly communicating ocean challenges to their respective sectors (IOC-UNESCO et al. 2011). By doing so, the impacts of a changing ocean on food, human health, development and the environment are highlighted and can be used to deliver funding strategies. Such dialogues will also present a good opportunity to develop an understanding with the finance community on the scale and urgency of the issues that need to be tackled, of the importance of building in flexibility in investment time horizons, and of including a diverse stakeholder group (from decision-makers to the wider community) in governance and equity ownership.

In addition to addressing specific inequalities related to ocean governance and developed versus developing countries (e.g., capping carbon limits for developed countries; improving fisheries access regimes), developed countries should financially support developing maritime countries with sustainable ocean management. Individual projects and regulations that address specific components of ocean governance are important and necessary, but there is a larger picture of whole-domain ocean governance that requires significant financial capital. In addition, for SMEs beset with problems associated with economies of scale and high transaction costs, business technology and innovation incubators are needed.

4.5. Explore New Financing Mechanisms and Tools

New innovative financing vehicles can be created and launched by the private sector alone or in partnership with public entities in developed and developing countries alike. In fact, the latter can leapfrog to innovative financial instruments in support of a SOE, climate change mitigation and adaptation, and the

Box 1. Innovative Financial Instruments

Example 1: Ghana launches funds to attain Sustainable Development Goals (SDGs). On 1 August 2019, Ghana introduced two funds with the objective of attracting finance to the country's effort to achieve the SDGs of the United Nations. The funds known as the SDG Green Fund and the SDG Delivery Fund will be mobilised and managed by the private sector, with government support—a kind of public-private partnership arrangement. The SDG Green Fund is geared towards the provision of clean and renewable energy ('Think Ocean') for use by industry, whereas the SDG Delivery Fund will draw finance to fund climate-smart activities. The funds are expected to raise billions of Ghanaian cedis (US\$1 = 5.40 cedis) from voluntary contributions and corporate social responsibility initiatives from the private sector to support the country's efforts towards achieving the SDGs.

Example 2: The Development Bank of Southern Africa establishes a 2-billion-rand (US\$142.86 million) Climate Finance Facility (CFF). The CFF will be available to infrastructure projects and businesses that mitigate or adapt to climate change. The finance facility raises capital from both private sector commercial banks and other development finance institutions. It co-funds projects by offering credit-enhancing products in the form of subordinated funding and/or tenor extension. The CFF provides risk mitigation where new technology is involved or the project and businesses are still in a developmental phase. This initiative applies the green bank concept. Green banks have been established in the developed world, but South Africa is probably the first to establish it in the developing world. The goal of these banks is to support the Paris Agreement and the SDGs. A similar example is the Seychelles blue bond. This blended finance combines a World Bank-guaranteed Global Environmental Facility concessionary loan and private investment to support a transition to sustainable fisheries and is implemented through the independent Seychelles Conservation and Climate Adaptation Trust and the national Development Bank of Seychelles.

environment in general. Two recent examples are described in Box 1.

New financing tools and access to capital markets are needed to act as a positive incentive for sustainable, inclusive and climate-resilient ocean activities. Innovative mechanisms that bring new forms of finance into the system and are more accessible to communities in developing countries, particularly women, youth and marginalised communities, will need to be created while reducing the overexploitation of ocean resources. These tools can also facilitate effective management and governance while promoting the security of the ocean space in a context of increased access to new ocean resources. In the Caribbean, programs are currently being developed to provide small-scale fishers with micro-insurance policies to protect them from

extreme weather risks and to provide governments with parametric policies that would help with the recovery of fisheries after an event with a severity that surpassed an agreed-upon threshold point (McConney et al. 2015). In Madagascar, a partnership between a commercial seafood exporter and a local research institute produces juvenile sea cucumbers for locally managed sea cucumber aquaculture farms, thereby enabling locals to earn income while reducing exploitation of wild stocks. It is expected that these schemes will also indirectly strengthen conservation and fisheries management.

A noteworthy financial mechanism developed and implemented by Impact Investment Exchange (IIX) and the IIX Foundation USA, known as the IIX Sustainability Bonds (ISBs), explicitly targets the inclusion of women in economic activities. These bonds are debt securities

that effectively mobilise large-scale private sector capital by pooling together a basket of high-impact entities (underlying borrowers) into a single structure. These instruments are then sold to impact investors and are paid back over time by the underlying borrowers, with a reasonable rate of interest. These ISBs can be listed on a social stock exchange to add an additional layer of transparency for both financial and impact performance.

Green/blue/climate bonds have to meet investment criteria and accountability requirements (e.g., Green Bond Principles; ESG criteria; and investment principles for sustainable fisheries) and certification to qualify for such labels and ensure the integrity of markets in the investment community. The Climate Bonds Initiative has put in place a number of sector criteria, including for marine energy and water utilities.³ Other relevant initiatives include the Blue Natural Capital Positive Impacts Framework and the technical guideline for blue bonds (Roth et al. 2019).⁴ Innovative financial instruments (e.g., green/blue bonds) are increasingly attractive and can generate new capital for sustainable ocean economic activities built on a healthy and well-managed ocean resource base (Hudson and Glemarec 2012; Miller et al. 2016; Thiele and Gerber 2017; Iyer et al. 2018; Walsh 2018; Jouffray et al. 2019).

Under a debt conversion program, also known as debt restructuring and formerly known as debt-for-nature swaps, negotiations take place whereby a portion of the debt owed to creditors is restructured and converted into agreed-upon initiatives that address, for instance, marine conservation and climate change. The debtors are then obligated to execute the initiatives. As an example, the government of Seychelles entered into a debt conversion program with the Paris Club, with the assistance of The Nature Conservancy (TNC). One of the conditions linked to the debt conversion was the development of the Seychelles Marine Spatial Plan. A new act was also passed to create the Seychelles Conservation and Climate Adaptation Trust, which provides a well-governed funding mechanism for the long-term financing of activities related to the stewardship of Seychelles' ocean resources and blue economy. We suggest that additional debt conversions be designed and implemented to support developing countries to implement ocean governance priorities. This will only be possible with full government commitment

due to the comprehensive negotiations and related obligations.

Having the right kind of investment structure is critical to the success of innovative finance mechanisms. Trust funds and endowments, in particular, have a strong track record in assuring long-term funding sources for conservation and development projects (de Vos and Hart 2020). Ultimately, the most appropriate financing mechanism depends on many factors, including scale and debt/equity mix. It will be important to showcase the ability of these mechanisms in achieving beneficial financial, social and environmental returns (Bladon et al. 2014; Baumann et al. 2017; Fitzgerald et al. 2020).

Along with having the right model, a trusted project entity is needed to manage and distribute the funds across aggregated projects, reducing the overall project risk and transaction costs, especially when projects are small scale (Bladon et al. 2014). Local business communities can achieve this by acting collectively in networks and forming cooperatives (Lubchenco et al. 2016) that can substantially lower transaction costs, identified as a key priority for investments into fisheries (WWF 2019). However, unless cooperatives have strong governance in place, they may not be suitable for large investment structures.

Although micro-finance continues to be important to many communities in the global south and east, innovative sustainable finance mechanisms should also play an important role in attracting and sustaining new forms of finance. These may include tried-and-tested models, such as payments for ecosystem services, debt-for-nature or adaptation swaps, new SOE investment funds or emerging MPA-financing models. Seychelles' innovative and blended financing mechanism has provided an important model at a national scale and has shown that developed countries have a strong role to play in supporting debt conversions that enable maritime developing countries to effectively invest in a SOE. The green finance space, which considers wider terrestrial sustainable finance challenges, has had a head start on sustainable ocean finance and may offer a wealth of experience, examples and best practices to adapt and apply to finance for the SOE.

For instance, blended finance can offer substantial opportunities to improve investor confidence by

providing up-front low-interest or grant-based investments to strengthen the enabling environment—such as strengthening the governance and regulatory environment and restoring the resource base—towards reducing the risk profile and improving investor confidence. This might include investing in (i) improved fisheries policies as well as monitoring control and surveillance at sea, including ABNJ, to reduce illegal, unreported and unregulated (IUU) fishing and strengthen sustainable management of fisheries; (ii) the effective protection of habitats and ecosystems, such as coral reefs, sea grass and mangroves that provide essential ecosystem services, including coastal protection and carbon sequestration; (iii) technology and capacity for implementation of marine spatial planning to reduce user conflicts and ensure that the cumulative impacts of activities do not exceed the carrying capacity of the ecosystem; and (iv) setting up investible entities that can substantially lower transaction costs and aggregate sustainable projects in a way that they become more investible. Larger projects can be structured as blue bonds and blended finance, whereas smaller projects may be more suitable for other forms of impact investing or other incremental investment approaches. The OECD's *Principles on Blended Finance* provides an important reference in this context (OECD 2017b).⁵

4.6. Stop Insuring Non-compliance and Develop Best Practices to Incentivise Sustainable Behaviour

The understanding and design of policies to deal with the negative effects of externalities is fundamental to achieving a SOE. This is because externalities underlie many aspects of our unsustainable behaviour. Whilst the SOE finance ecosystem develops, immediate action should be taken to avoid financing practices that support illegal and significantly harmful activities in the SOE, such as illegal fishing (Sumaila et al. 2020; Widjaja et al. 2020) and pollution (Jambeck et al. 2020), and work towards incentivising positive behaviour at both macro and micro levels.

Such activities pose risks to the ocean and have significant costs to people, the private sector (e.g., insurance companies) and governments. In 2017, an industry-wide statement against IUU fishing was

launched, confirming the commitment of insurers, brokers and agents to not knowingly insure or facilitate the insuring of IUU fishing vessels (Miller et al. 2018). Economic instruments such as subsidies and taxes are cost-effective mechanisms that can help eliminate the effects of negative externalities while promoting positive externalities (Milazzo 1998; Akerlof and Kranton 2000; Ellickson 2001; Kübler 2001; Clark et al. 2005; Sumaila and Pauly 2007; Sumaila et al. 2010).

Institutional investors can use their influence to promote transparency and best practices in seafood and other ocean sectors, such as those implemented by the Fisheries Transparency Initiative (FiTi). Supply chain traceability is fundamental to the ability of any investor to exercise due diligence. The arguably low traceability in many marine seafood supply chains currently impedes this capacity of corporate investors to steer investments towards more sustainable practices. Yet catch documentation and certification schemes offer mechanisms to enhance traceability. To ensure scrutiny of corporate behaviour, investors should demand that companies show demonstrable efforts at achieving full-chain traceability, and that they fully declare their product mix and sourcing (including area and supplier). Furthermore, investors should insist on the systematic disclosure of metrics such as biomass produced, amount of antibiotics used and percentage of eco-certified products.

Corporate debt also provides a powerful source of influence for banks to promote sustainability in all ocean sectors. Although the literature on bank lending and environmental sustainability remains limited (Coulson and Monks 1999; Thompson and Cowton 2004; Jouffray et al. 2019), a recent review of the plausible power of banks in setting a sustainability agenda suggests that covenants are a key mechanism to examine further (Jouffray et al. 2019). By regulating the actions of the borrower, covenants can be important mechanisms through which banks can incentivise and steer companies towards implementing improved sustainability measures. Unlike blue or green loans, which are earmarked to finance a specific project, sustainability-linked covenants can be used for general corporate purposes. Providers of corporate debt should develop loan covenants based on the best available practices. Whereas such covenants will require tailoring

to fit specific sectors, initiatives such as the Principles for Investment in Sustainable Wild-Caught Fisheries (EDF et al. 2018) and the Ocean Disclosure Project can serve as valuable baselines to be further developed.⁶

A good example of how to overcome these challenges is the introduction of special green investment funds in the Netherlands that are exempt from income tax, thus allowing investors in green projects to contract loans at reduced interest rates (usually around 2 percent less than commercial rates). Some of the approved funds include investments that aim to improve ocean sustainability by encouraging green shipping or incentivising cruise ships to use electric energy. These Dutch green funds have attracted more investment than can be utilised in the available schemes (Mountford and Keppler 1999), which is a very good sign for the future prospects of such initiatives.

4.7. Boost New Approaches to Insurance

The insurance industry has the potential to play three important roles: as risk managers, risk carriers, and investors. As risk managers and carriers who rely on research, modelling and data analysis, insurers can recommend more sustainable practices to their clients and the communities they service. Insurers are also major institutional investors, and in this role, they can elect to support only those clients or projects that contribute to a SOE and to divest from those that do not. There is also an opportunity for all levels of government—local, national and international—to work with the insurance industry to promote the development of a SOE. At the local level, this could involve making improvements in risk modelling; at the national and international levels, policy and regulatory frameworks could be reshaped to incentivise responsible and sustainable maritime industry practices (Carr 2018; Laffoley and Baxter 2018; Niehörster and Murnane 2018).

Insurance can also be a source of finance that can be used both to leverage private investments such as blended finance and/or directly invest in the conservation and sustainable use of the ocean. Mechanisms to address local externalities can be designed and implemented by a single country, but it is much more challenging to address global externalities.

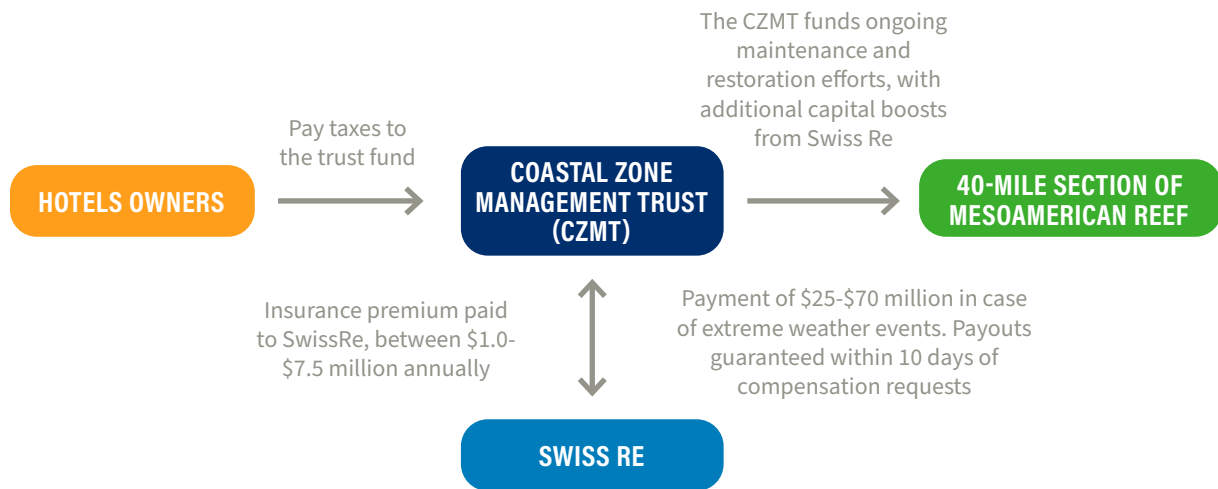
In June 2019, the first-ever insurance policy on natural infrastructure was put in place on a portion of the Mesoamerican Reef in the Mexican Caribbean. Created through an initiative led by TNC, this policy secures funding to repair damages to the reef following a hurricane, preventing long-term damage and enhancing protection of the onshore community. Studies have been completed that estimate the monetary values of the protection offered by coastal habitats, and these findings justify the development of the Mesoamerican Reef policy and the future creation of insurance policies elsewhere, which TNC hopes to pursue.

Insurance companies could design novel products that proactively seek commercial opportunities. For example, TNC, Swiss Re and several partners have developed a coral reef insurance mechanism in Quintana Roo, Mexico, to provide finance to build the resilience of coral reefs to storm damage and to fund restoration activities in the event of a large storm event (Iyer et al. 2018) (Figure 4).

There appears to be great potential for the creation of additional insurance products and services that can contribute to the creation of a SOE. The insurance industry could become a leader in tackling the issue of marine plastic pollution (Lau et al. 2020), for example. Insurers could provide insurance statistics to show the extent to which plastic debris enters the ocean from at-sea sources and its economic impact. Similar to what has been done on the topic of IUU fishing, insurance industry guidelines and other strategies for influencing reduced plastic marine pollution from at-sea sources, seabed mining and biotechnology investment could be developed.

The Pacific Ocean Finance Program is funding the analysis and development of novel ocean insurance products for the Pacific Islands region in partnership with Willis Towers Watson (Wharton and Young, forthcoming). Three draft concepts for the potential application of parametric insurance to support ocean health are in development, including (i) parametric cyclone insurance for a segment of the Great Sea Reef in Fiji to incentivise preparedness and finance rapid response and early recovery after major cyclone shock events, (ii) parametric insurance for marine thermal shock events using a sea surface temperature index to help mitigate the economic

Figure 4. Simplified Conceptual Diagram of Coral Reef Insurance for the Mesoamerican Reef



*Note: All figures are in US\$.
Source: Iyer et al. 2018.*

consequences of tourism revenue decline due to sudden natural asset degradation in Palau and (iii) livelihood protection as a social benefit through parametric insurance to support fishers’ resilience and incentivise improved fisheries management in Vanuatu.

In addition, the ADB, the Global Environment Facility, and TNC are collaborating on developing natural capital insurance products for coral reefs in Asia and the Pacific Islands. Another relevant initiative is the Ocean Risk and Resilience Action Alliance, launched at the UN Secretary-General’s Climate Action Summit in 2019, which is designed to help drive the development of innovative finance products to regenerate coastal natural capital and build resilience in the world’s most exposed and vulnerable regions and communities.

The marine insurance sector has already begun implementing strategies to manage and reduce ocean-related risks. The development of this statement was facilitated by the environmental non-profit organisation Oceana and UNEP’s PSI initiative. To date, more than 30 insurers, insurance market bodies and key stakeholders, spread across five continents, have signed

and supported this statement, including some of the world’s largest companies. Working again with the PSI Secretariat and with contributions from industry stakeholders, Oceana developed risk management guidelines that were launched in February 2019 (Miller et al. 2018). These guidelines help insurers avoid contracts associated with IUU fishing and improve transparency and accountability within the global fishing sector. The FiTi and other transparency programs can help guide and support appropriate investment in the ocean economy.

Looking to the future, insurers can also follow guidance issued by the PSI to determine how they can best contribute to a SOE and manage ESG risks. Together with the support of industry contributors, the PSI Secretariat recently developed a draft guide for managing ESG risks in the non-life insurance business (UNEP FI and PSI 2019). The guide contains heatmaps indicating areas of potential elevated risk within various economic sectors and lines of insurance, and it also provides a list of standards and technical guidelines that are available to help insurers identify, assess and mitigate risks.

5. Conclusions

A healthy ocean that supports a SOE requires a range of interventions to improve governance, science and management; finance is an important enabler of a SOE and the major driver behind all ocean-based commercial activities. The best ocean policies and practices can be undone by inadequate financing and by economic externalities that undermine conservation and sustainable use.

This Blue Paper provides an evaluation of how economic instruments and finance mechanisms can be applied to realise a SOE. To turn ocean sustainability challenges into opportunities, the public and private sectors need to create and better mobilise a full suite of financial tools and approaches, insurance, and fiscal and market incentives. Additionally, they need to strengthen key aspects of the enabling environment to support the transition to an ocean economy that is sustainable and inclusive; this can be accomplished by making the

benefits the SOE generates available to all, especially women, youth and marginalised communities.

The most significant action will be to influence future mainstream finance. By providing clear principles, guiding frameworks and metrics, and by proactively avoiding the financing of known illegal and harmful activities, trillions of dollars of ocean finance could be redirected towards sustainable development pathways, creating long-term and positive systemic change.

If our suggestion to allocate a higher proportion of ocean GDP to attaining a SOE is followed by half of the world's maritime countries, that alone could generate the seed money needed to incentivise the kind of public and private investments needed to ensure a SOE. The big message from this contribution is that a significant increase in sustainable ocean finance will be required to ensure a SOE that benefits all, including a broad section of society and businesses.

Appendix A: Definitions of Sustainable Ocean Economy and Blue Economy

Asian Development Bank	The environmental, social and economic sustainability of sectors that impact and/or derive economic activity from the ocean.
Center for the Blue Economy	It uses three related but distinct meanings: (i) the overall contribution of the ocean to economies, (ii) the need to address the environmental and ecological sustainability of the oceans, and (iii) the ocean economy as a growth opportunity for both developed and developing countries.
Economist Intelligence Unit (2015 adapted working definition)	A sustainable ocean economy emerges when economic activity is in balance with the long-term capacity of ocean ecosystems to support this activity and remain resilient and healthy.
Organisation for Economic Co-operation and Development	The ocean economy can be defined as the sum of the economic activities of ocean-based industries as well as the assets, goods and services of marine ecosystems.
United Nations Development Program	Protecting and restoring ocean resources while increasing the economic activity derived from the ocean.
World Bank	The sustainable use of ocean resources for economic growth, improved livelihoods and jobs while preserving the health of the ocean ecosystem.
World Wide Fund for Nature	A sustainable blue economy is one which provides social and economic benefits for current and future generations; restores, protects and maintains diverse, productive and resilient ecosystems; and is based on clean technologies, renewable energy and circular material flows.

Appendix B: The MPA Financing Gap

Binet et al. (2015) assessed financing needs and gaps for MPAs in the Mediterranean and found that the 14 countries studied funded their MPA systems to the tune of nearly \$60.5 million per year. The authors also found that the financing needs for effective management of these MPAs was much higher, resulting in a financing gap (available funds minus financial needs) of \$776.4 million per year. Data reported in Sumaila et al. (2019) reveals that the total cost of establishing and maintaining MPAs in 2018 worldwide was \$2.3 billion. It is known that not all of the currently declared MPA area of 7.3 percent of the ocean surface is adequately protected. In fact, only 2.3 percent is currently 'highly' or 'fully protected', and most of the remaining 5 percent is not protected at all (Sala et al. 2018). Hence, to get to 10 percent of highly or fully protected areas from the current 2.3 percent, \$7.7 billion is needed globally. Clearly, and as suggested by Laffoley et al. (2020), adequate, comprehensive and effective funding mechanisms will need to be put in place to deliver the actions required for integrated ocean management in support of a SOE.

Although the costs of establishing and running MPAs (which should be more appropriately seen as investments) are high, there are numerous benefits for implementing MPAs. Effectively managed and located

MPAs reduce fishing pressure and increase habitat protection and ecosystem resilience (Costello 2014). This can lead to ecological benefits such as an increase in the abundance, diversity, size and biomass of fish and invertebrate species (McClanahan et al. 2007; Russ et al. 2008; Lester et al. 2009). MPAs may also help marine organisms, ecosystems and societies adapt to climate change by protecting habitats from harm and degradation, thereby reducing the effects of climate change. For example, intact coastal ecosystems can reduce the risks arising from more frequent and severe storms and flooding (Roberts et al. 2017). The ecological benefits from MPAs can translate into economic benefits. For instance, fisheries benefits can arise from the spillover of fish biomass from inside the MPA to fished areas outside the MPA (Russ et al. 2004; Goñi et al. 2008). Well-implemented MPAs can also benefit the tourism and recreation sectors (Ballantine 2014) and provide ecosystem goods and services (e.g., coastal protection from coral reefs, mangroves and sea grass) (Davis et al. 2019). These studies show the insurance, market and non-market values of protecting a significant portion of the ocean portfolio and highlight the fact that establishing MPAs not only support social equity and ocean health but also make economic sense.

Appendix C: The Types and Sources of Capital for Financing a SOE

Several capital types are currently available that can be used to either finance a SOE or serve as the basis for developing new innovative ones that can better serve the ocean economy. A broad categorisation of capital types is provided by de Vos and Hart (2020). The deployment of these different types of capital by investors depends on the expected returns from the investment, which, in turn, depend on the risk-return equation faced by investors (Table C1).

Some of the needed investments in a SOE are likely to generate competitive expected **market returns** and should be better promoted/simplified for private investors. Other investments should expect positive but **below-market returns**. In this case, the blending of private and public capital can still deliver adequate returns to investors, such as impact funds. Other investments are ‘pure costs’ and need socially beneficial subsidies (i.e., those that help society eliminate negative externalities or reinforce positive ones), public investments and philanthropy (grants) to work (Table C1).

Table C1. Capital Types and Their Use Depending on Expected Returns

CAPITAL TYPE	DESCRIPTION	EXPECTED RETURN (MARKET OR BELOW MARKET, INCLUDING <0 RETURN)
Impact only <ul style="list-style-type: none"> • Corporate social responsibility investment • Public grants • Philanthropic grants • Public financing • Official development assistance 	This is usually long term but small-scale in comparison to larger types of commercial finance.	Below-market return
Debt <ul style="list-style-type: none"> • Loans • Bonds 	This is a low-risk, low-reward type of capital. Debt providers do not have the same level of influence over an investment as equity investors.	Market return
Equity <ul style="list-style-type: none"> • Public equity • Equity investment 	Equity is based on taking an ownership stake in an investment; some types of equity (e.g., venture capital) are high risk, high reward.	Greater-than-market return
Blended finance	This combines official development assistance with other private or public resources in order to ‘leverage’ additional funds from other actors.	Below-market return

Note: See de Vos and Hart (2020) for more details and examples.

Appendix D: Threats to the Ocean Economy

The following environmental and social impacts have the potential to undermine the sustainability of the ocean economy.

Environmental Impacts

FISHING AND CAPTURE OF MARINE LIFE

Overfishing, whaling and shark finning; habitat destruction from fishing gear and practices; ghost fishing; discards, bycatch and entanglement

MARINE POLLUTION

Plastics, mercury and other heavy metals; garbage; and land-based pollution, including nutrients and agri-chemicals, directly harm marine organisms and ecosystems (e.g., ingestion of plastics, algal blooms, eutrophication)

CLIMATE CHANGE

Ocean warming; ocean acidification, sea level rise, more frequent events, hypoxia and dead zones; melting ice caps

MARINE MINING, OFFSHORE OIL AND GAS

Biodiversity and habitat loss; oil spills

FISH FARMING

Escapes; overuse of antibiotics; excessive use of fishmeal and oil

COASTAL AND MARINE TOURISM

Habitat destruction and damage from the construction and operation of tourism infrastructure; impact of tours and activities on habitat and biodiversity; wastewater and garbage pollution from tourists

COASTAL DEVELOPMENT

Habitat destruction and damage from the construction and operation of coastal infrastructure; impact of coastal cities on habitat and biodiversity; wastewater and garbage pollution from coastal populations

PORTS AND SHIPPING

Habitat damage; ship groundings; anchor damage; the dumping of rubbish; invasive species from ballast water; oily waste

Social Impacts

OCEAN GRABBING/BLUE-WASHING

Delineation of ocean space that marginalises certain groups, resulting in loss of livelihoods, and compromises food security; hasty planning and limited resources can impact integrated ocean management

PERVERSE ECONOMIC INCENTIVES

Fisheries and other sectoral subsidies that harm marine ecosystems while favouring industrial scale operators, compromise food security and put small-scale operators and women at a disadvantage

GLOBAL MARKETS

The pursuit to service global markets can jeopardise locals' access to ocean resources, compromising food security and livelihoods; gains generated in distant markets also rarely trickle down to local producers

Endnotes

- 1 For example, see Katapult Ocean (<https://katapultocean.com/>).
- 2 Based on personal communication from D. Schmitz of Swimsol.
- 3 For more information about the Climate Bonds Initiative, see <https://www.climatebonds.net>.
- 4 To learn more about the Blue Natural Capital Positive Impacts Framework, see <https://bluenaturalcapital.org>.
- 5 For an overview of some other instruments and how they enable investment, please consult *The Ocean Finance Handbook* (de Vos and Hart 2020).
- 6 For more information about the Ocean Disclosure Project, see www.oceandisclosureproject.org.

References

- ADB (Asian Development Bank). 2020. "Explainer: The Role of Ocean Finance in Transitioning to a Blue Economy in Asia and the Pacific." Development Asia. <https://development.asia/explainer/role-ocean-finance-transitioning-blue-economy-asia-and-pacific>.
- AIMS (Australian Institute of Marine Science). 2018. *The AIMS Index of Marine Industry*. Townsville, Australia: AIMS. <https://www.aims.gov.au/sites/default/files/2018%20AIMS%20Marine%20Index.pdf>.
- Akerlof, G.A., and R.E. Kranton. 2000. "Economics and Identity." *Quarterly Journal of Economics* 115 (3): 715–53. <https://doi.org/10.1162/00335530054881>.
- Ballantine, B. 2014. "Fifty Years On: Lessons from Marine Reserves in New Zealand and Principles for a Worldwide Network." *Biological Conservation* 176 (August): 297–307. <https://doi.org/10.1016/j.biocon.2014.01.014>.
- Baumann, K., T. Havemann, F. Werneck, C. Negra, and S. Nair. 2017. *Capitalising Conservation: How Conservation Organisations Can Engage with Investors to Mobilise Capital*. Zurich: Clarmondial AG. http://cpicfinance.com/wp-content/uploads/2018/05/Capitalising_Consevation_Clarmondial_WWF.pdf.
- Binet, T., A. Diazabakana, and S. Hernandez. 2015. *Sustainable Financing of Marine Protected Areas in the Mediterranean: A Financial Analysis*. Marseille, France: MedPAN. http://www.rac-spa.org/sites/default/files/doc_medmpanet/final_docs_regional/55_study_on_the_sustainable_financing_of_mediterranean_mpas.pdf.
- Bladon, A., E.Y. Mohammed, and E.J. Milner-Gulland. 2014. "A Review of Conservation Trust Funds for Sustainable Marine Resources Management: Conditions for Success." Working Paper. London: International Institute for Environment and Development. <https://pubs.iied.org/pdfs/16574IIED.pdf>.
- Carr, S., ed. 2018. "Can We Insure Our Way to Healthier Oceans and Communities?" *Skimmer on Marine Ecosystems and Management* (blog). <https://meam.openchannels.org/news/skimmer-marine-ecosystems-and-management/can-we-insure-our-way-healthier-oceans-and-ocean>.
- Clark, C.W., G.R. Munro, and U.R. Sumaila. 2005. "Subsidies, Buybacks, and Sustainable Fisheries." *Journal of Environmental Economics and Management* 50 (1): 47–58. <https://doi.org/10.1016/j.jeem.2004.11.002>.
- Coady, D., I. Parry, N.P. Le, and B. Shang. 2019. "Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates." Working Paper 19/89. Washington, DC: International Monetary Fund. <https://www.imf.org/en/Publications/WP/Issues/2019/05/02/Global-Fossil-Fuel-Subsidies-Remain-Large-An-Update-Based-on-Country-Level-Estimates-46509>.
- Costello, C., D. Ovando, T. Clavelle, C.K. Strauss, R. Hilborn, M.C. Melnychuk, T.A. Branch, et al. 2016. "Global Fishery Prospects under Contrasting Management Regimes." *Proceedings of the National Academy of Sciences of the United States of America* 113 (18): 5125–29. <https://doi.org/10.1073/pnas.1520420113>.
- Costello, M.J. 2014. "Long Live Marine Reserves: A Review of Experiences and Benefits." *Biological Conservation* 176 (August): 289–96. <https://doi.org/10.1016/j.biocon.2014.04.023>.
- Coulson, A.B., and V. Monks. 1999. "Corporate Environmental Performance Considerations within Bank Lending Decisions." *Eco-Management and Auditing* 6 (1): 1–10. [https://doi.org/10.1002/\(SICI\)1099-0925\(199903\)6:1<1::AID-EMA93>3.0.CO;2-M](https://doi.org/10.1002/(SICI)1099-0925(199903)6:1<1::AID-EMA93>3.0.CO;2-M).
- Davis, K.J., G.M.S. Vianna, J.J. Meeuwig, M.G. Meekan, and D.J. Pannell. 2019. "Estimating the Economic Benefits and Costs of Highly-Protected Marine Protected Areas." *Ecosphere* 10 (10): e02879. <https://doi.org/10.1002/ecs2.2879>.
- de Vos, K., and B. Hart. 2020. *The Ocean Finance Handbook: Increasing Finance for a Healthy Ocean*. Geneva: Friends of Ocean Action. http://www3.weforum.org/docs/WEF_FOA_The_Ocean_Finance_Handbook_April_2020.pdf.
- EDB (Economic Development Board Mauritius). 2020. "Blue Economy: The Development of a New Pole of Growth through the Sustainable Use of Our Maritime Zone." <https://www.edbmauritius.org/opportunities/ocean-economy/>.
- EDF (Environmental Defense Fund) and Nicholas Institute for Environmental Policy Solutions. 2018. *Financing Fisheries Reform: Blended Capital Approaches in Support of Sustainable Wild-Capture Fisheries*. New York: EDF; Durham, NC: Nicholas Institute for Environmental Policy Solutions, Duke University. <https://www.edf.org/sites/default/files/documents/financing-fisheries-reform.pdf>.
- EDF, Rare/Meloy Fund, and Encourage Capital. 2018. *Principles for Investment in Sustainable Wild-Caught Fisheries*. New York: EDF and Encourage Capital; Arlington, VA: Rare/Meloy. http://www.fisheriesprinciples.org/files/2019/05/updated-PrinciplesInvestmentWEB_final.pdf.
- Ellickson, R.C. 2001. "The Market for Social Norms." *American Law and Economics Review* 3 (1): 1–49. <https://www.jstor.com/stable/42705380>.
- European Commission. 2020. *Taxonomy: Final Report of the Technical Expert Group on Sustainable Finance*. Brussels: Technical Expert Group on Sustainable Finance, European Commission. https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy_en.pdf.
- FAO (Food and Agriculture Organization of the United Nations). 2013. *Implementing Improved Tenure Governance in Fisheries: A Technical Guide to Support the Implementation of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security*. Rome: FAO. <http://www.fao.org/3/i3420e/i3420e.pdf>.
- FAO. 2018. *The State of World Fisheries and Aquaculture 2018: Meeting the Sustainable Development Goals*. Rome: FAO. <http://www.fao.org/3/i9540en/i9540en.pdf>.
- Fenichel, E.P., B. Milligan, I. Porras, E.T. Addicott, R. Árnasson, M. Bordt, S. Djavidnia, et al. 2020. *National Accounting for the Ocean and Ocean Economy*. Washington, DC: World Resources Institute. <https://oceanpanel.org/sites/default/files/2020-08/National%20Accounting%20for%20the%20Ocean%20Final%20Full%20Paper.pdf>.
- Fitzgerald, T.P., P.R. Higgins, E. Quilligan, S.A. Sethi, and J. Tobin-de la Puente. 2020. "Catalyzing Fisheries Conservation Investment." *Frontiers in Ecology and the Environment* 18 (3): 151–58. <https://doi.org/10.1002/fee.2147>.
- Fritsch, D. 2020. *Investors and the Blue Economy*. Zurich: Credit Suisse.
- Gaines, S., R. Cabral, C. Free, Y. Golbuu, R. Arnason, W. Battista, D. Bradley, D., et al. 2019. *The Expected Impacts of Climate Change on the Ocean Economy*. Washington, DC: World Resources Institute. <https://www.oceanpanel.org/sites/default/files/2019-12/expected-impacts-climate-change-on-the-ocean-economy.pdf>.
- Goñi, R., S. Adlerstein, D. Alvarez-Berastegui, A. Forcada, O. Refiones, G. Criquet, S. Polti, et al. 2008. "Spillover from Six Western Mediterranean Marine Protected Areas: Evidence from Artisanal Fisheries." *Marine Ecology Progress Series* 366 (August): 159–74. <https://doi.org/10.3354/meps07532>.

- Grace, L., and R. van Anrooy. 2019. *Guidelines for Micro-Finance and Credit Services in Support of Small-Scale Fisheries in Asia: A Handbook for Finance and Fisheries Stakeholders*. Rome: FAO. <http://www.fao.org/3/ca5128en/CA5128EN.pdf>.
- Harper, S., M. Adshade, V.W.Y. Lam, D. Pauly, and U.R. Sumaila. 2020. "Valuing Invisible Catches: Estimating the Global Contribution by Women to Small-Scale Marine Capture Fisheries Production." *PLOS ONE* 15 (3): e0228912. <https://doi.org/10.1371/journal.pone.0228912>.
- Hernández-Delgado, E.A. 2015. "The Emerging Threats of Climate Change on Tropical Coastal Ecosystem Services, Public Health, Local Economies and Livelihood Sustainability of Small Islands: Cumulative Impacts and Synergies." *Marine Pollution Bulletin* 101 (1): 5–28. <https://doi.org/10.1016/j.marpolbul.2015.09.018>.
- Hoegh-Guldberg, O., et al. 2015. *Reviving the Ocean Economy: The Case for Action—2015*. Gland, Switzerland: WWF International. https://c402277.ssl.cf1.rackcdn.com/publications/790/files/original/Reviving_Ocean_Economy_REPORT_low_res.pdf?1429717323.
- Hoegh-Guldberg, O., et al. 2019. *The Ocean as a Solution to Climate Change: Five Opportunities for Action*. Washington, DC: World Resources Institute. https://oceanpanel.org/sites/default/files/2019-10/HLP_Report_Ocean_Solution_Climate_Change_final.pdf.
- Holmes, L., C.K. Strauss, K. de Vos, and K. Bonzon. 2014. *Towards Investment in Sustainable Fisheries: A Framework for Financing the Transition*. New York: Environmental Defense Fund; London: Prince of Wales's International Sustainability Unit. <https://www.edf.org/sites/default/files/content/towards-investment-in-sustainable-fisheries.pdf>.
- Hudson, A., and Y. Glemarec. 2012. *Catalyzing Ocean Finance: Transforming Markets to Restore and Protect the Global Ocean*. Vol. 1. New York: United Nations Development Programme. https://www.undp.org/content/undp/en/home/librarypage/environment-energy/water_governance/ocean_and_coastalareagovernance/catalyzing-ocean-finance.html.
- Huwylar, F., J. Kappeli, K. Serafimova, E. Swanson, and J. Tobin. 2014. *Conservation Finance Moving beyond Donor Funding toward an Investor-Driven Approach*. Zurich: Credit Suisse; Gland, Switzerland: WWF; New York: McKinsey.
- IOC-UNESCO (Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization), IMO (International Maritime Organization), FAO (Food and Agriculture Organization of the United Nations), and UNDP (United Nations Development Programme). 2011. *A Blueprint for Ocean and Coastal Sustainability*. Paris: IOC-UNESCO.
- IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services). 2019. *Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Bonn: IPBES Secretariat. <https://ipbes.net/global-assessment>.
- IPCC (Intergovernmental Panel on Climate Change). 2019. "Summary for Policymakers." In *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*, edited by H.O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, et al. Geneva: IPCC. https://www.ipcc.ch/site/assets/uploads/sites/3/2019/11/03_SROCC_SPM_FINAL.pdf.
- IRENA (International Renewable Energy Agency). 2018. *Offshore Innovation Widens Renewable Energy Options: Opportunities, Challenges and the Vital Role of International Cooperation to Spur the Global Energy Transformation*. Abu Dhabi: IRENA. <https://www.irena.org/publications/2018/Sep/Offshore-innovation-widens-renewable-energy-options>.
- Iyer, V., K. Mathias, D. Meyers, R. Victorine, and M. Walsh. 2018. *Finance Tools for Coral Reef Conservation: A Guide*. New York: Wildlife Conservation Society; Washington, DC: Conservation Finance Alliance. <https://static1.squarespace.com/static/57e1f17b37c58156a98f1ee4/t/5c7d85219b747a7942c16e01/1551730017189/50+Reefs+Finance+Guide+FINAL-sm.pdf>.
- Jambeck, J., E. Moss, B. Kumar Dubey, et al. 2020. *Pollution and a Regenerative Economy: Municipal, Industrial, Agricultural, and Maritime Waste, Its Impacts, and Solutions*. Washington, DC: World Resources Institute.
- Jouffray, J.-B., R. Blasiak, A.V. Norström, H. Österblom, and M. Nyström. 2020. "The Blue Acceleration: The Trajectory of Human Expansion into the Ocean." *One Earth* 2 (1): 43–54. <https://doi.org/10.1016/j.oneear.2019.12.016>.
- Jouffray, J.-B., B. Crona, E. Wassénius, J. Bebbington, and B. Scholtens. 2019. "Leverage Points in the Financial Sector for Seafood Sustainability." *Science Advances* 5 (10): eaax3324. <https://doi.org/10.1126/sciadv.aax3324>.
- J.P. Morgan and GIIN (Global Impact Investing Network). 2014. *Spotlight on the Market: The Impact Investor Survey*. New York: J.P. Morgan and GIIN. <https://thegiin.org/assets/documents/pub/2014MarketSpotlight.PDF>.
- Koh, H., A. Karamchandani, and R. Katz. 2012. *From Blueprint to Scale: The Case for Philanthropy in Impact Investing*. New York: Monitor Group. https://acumen.org/wp-content/uploads/2017/09/From-Blueprint-to-Scale-Case-for-Philanthropy-in-Impact-Investing_Full-report.pdf.
- Kübler, D. 2001. "On the Regulation of Social Norms." *Journal of Law, Economics, and Organization* 17 (2): 449–76. <https://www.jstor.org/stable/3554935>.
- Laffoley, D., and J.M. Baxter. 2018. *Ocean Connections: An Introduction to Rising Risks from a Warming, Changing Ocean*. Gland, Switzerland: International Union for Conservation of Nature. <https://portals.iucn.org/library/sites/library/files/documents/2018-021-En.pdf>.
- Laffoley, D., J.M. Baxter, D.J. Amon, D.E.J. Currie, C.A. Downs, J.M. Hall-Spencer, H. Harden-Davies, et al. 2020. "Eight Urgent, Fundamental and Simultaneous Steps Needed to Restore Ocean Health, and the Consequences for Humanity and the Planet of Inaction or Delay." *Aquatic Conservation: Marine and Freshwater Ecosystems* 30 (1): 194–208. <https://doi.org/10.1002/aqc.3182>.
- Lau, W.W.Y., Y. Shiran, R.M. Bailey, E. Cook, M.R. Stuchtey, J. Koskella, C.A. Velis, et al. 2020. "Evaluating Scenarios toward Zero Plastic Pollution." *Science* (July): eaba9475. <https://doi.org/10.1126/science.aba9475>.
- Lee, T., and H. Nam. 2017. "A Study on Green Shipping in Major Countries: In the View of Shipyards, Shipping Companies, Ports, and Policies." *Asian Journal of Shipping and Logistics* 33 (4): 253–62. <https://doi.org/10.1016/j.ajsl.2017.12.009>.
- Lester, S.E., B.S. Halpern, K. Grorud-Colvert, J. Lubchenco, B.I. Ruttenberg, S.D. Gaines, S. Airamé, and R.R. Warner. 2009. "Biological Effects within No-Take Marine Reserves: A Global Synthesis." *Marine Ecology Progress Series* 384 (May): 33–46. <https://doi.org/10.3354/meps08029>.
- Lubchenco, J., E.B. Cerny-Chipman, J.N. Reimer, and S.A. Levin. 2016. "The Right Incentives Enable Ocean Sustainability Successes and Provide Hope for the Future." *Proceedings of the National Academy of Sciences of the United States of America* 113 (51): 14507–14. <https://doi.org/10.1073/pnas.1604982113>.
- Martini, R., and J. Innes. 2018. "Relative Effects of Fisheries Support Policies." Food, Agriculture and Fisheries Paper 115. Paris: Organisation for Economic Co-operation and Development. <http://dx.doi.org/10.1787/bd9b0dc3-en>.

- McClanahan, T.R., N.A.J. Graham, J.M. Calnan, and M.A. MacNeil. 2007. "Toward Pristine Biomass: Reef Fish Recovery in Coral Reef Marine Protected Areas in Kenya." *Ecological Applications* 17 (4): 1055–67. <https://doi.org/10.1890/06-1450>.
- McConney, P., S.-A. Cox, and K. Parsram. 2015. "Building Food Security and Resilience into Fisheries Governance in the Eastern Caribbean." *Regional Environmental Change* 15 (7): 1355–65. <https://doi.org/10.1007/s10113-014-0703-z>.
- Milazzo, M. 1998. "Subsidies in World Fisheries: A Reexamination." Technical Paper 406. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/133031468776403491/Subsidies-in-world-fisheries-a-re-examination>.
- Miller, D.D., B. Bacani, and O. Fabry. 2018. *Risk Assessment and Control of IUU Fishing for the Marine Insurance Industry: Guidelines to Control or Mitigate the Risk of Insuring Vessels and Companies Associated with Illegal, Unreported and Unregulated (IUU) Fishing*. Madrid: Oceana; Geneva: United Nations Environment Programme. https://eu.oceana.org/sites/default/files/oceana-psi_insurance_industry_guidelines_for_iuu_fishing_final_with_doi.pdf
- Miller, D.D., U.R. Sumaila, D. Copeland, D. Zeller, B. Soyer, T. Nikaki, G. Leloudas, S.T. Fjellberg, R. Singleton, and D. Pauly. 2016. "Cutting a Lifeline to Maritime Crime: Marine Insurance and IUU Fishing." *Frontiers in Ecology and the Environment* 14 (7): 357–62. <https://doi.org/10.1002/fee.1293>.
- Mountford, H., and J.H. Keppler. 1999. "Financing Incentives for the Protection of Biodiversity." *Science of The Total Environment* 240 (1–3): 133–44. [https://doi.org/10.1016/S0048-9697\(99\)00312-5](https://doi.org/10.1016/S0048-9697(99)00312-5).
- Niehörster, F., and R.J. Murnane. 2018. *Ocean Risk and the Insurance Industry*. London: XL Catlin Services. <https://www.oceanrisksummit.com/Content/press-releases/FALK-MAIN-REPORT-FINAL-LOW-RES.pdf>.
- NOAA (National Oceanic and Atmospheric Administration). 2019. *NOAA Report on the US Ocean and Great Lakes Economy*. Charleston, SC: NOAA Office for Coastal Management. <https://coast.noaa.gov/data/digitalcoast/pdf/econ-report.pdf>.
- Noone, K.J., U.R. Sumaila, and R.J. Diaz, eds. 2013. *Managing Ocean Environments in a Changing Climate: Sustainability and Economic Perspectives*. London: Elsevier.
- OECD (Organisation for Economic Co-operation and Development). 2006. *Development Co-operation Report 2005. Efforts and Policies of the Members of the Development Assistance Committee*. Paris: OECD. <https://doi.org/10.1787/dcr-2005-en>.
- OECD. 2016. *The Ocean Economy in 2030*. Paris: OECD. <https://doi.org/10.1787/9789264251724-en>.
- OECD. 2017a. *Marine Protected Areas: Economic, Management and Policy Mixes*. Paris: OECD. <https://doi.org/10.1787/9789264276208-en>.
- OECD. 2017b. *Principles on Blended Finance*. Paris: OECD. <http://www.oecd.org/dac/financing-sustainable-development/blended-finance-principles/>.
- OECD. 2018. *OECD Companion to the Inventory of Support Measures for Fossil Fuels 2018*. Paris: OECD. <https://doi.org/10.1787/9789264286061-en>.
- OECD. 2019a. *Biodiversity: Finance and the Economic and Business Case for Action*. Paris: OECD. <https://www.oecd.org/environment/resources/biodiversity/G7-report-Biodiversity-Finance-and-the-Economic-and-Business-Case-for-Action.pdf>.
- OECD. 2019b. *Environment at a Glance Indicators*. Paris: OECD. <https://doi.org/10.1787/ac4b8b89-en>.
- OECD. n.d. "OECD Work in Support of a Sustainable Ocean." <https://www.oecd.org/ocean/#:~:text=The%20ocean%20covers%20two%2Dthirds,vital%20for%20human%20well%2Dbeing,&text=Working%20with%20both%20developed%20and,a%20sustainable%20and%20inclusive%20basis>. Accessed 1 September 2020.
- Österblom, H., C. Wabnitz, D. Tladi, et al. 2020. *Towards Ocean Equity*. Washington, DC: World Resources Institute. <https://www.oceanpanel.org/sites/default/files/2020-04/towards-ocean-equity.pdf>.
- Our Ocean. 2019. "Commitments 2019." <https://ourocean2019.no/commitments/>.
- PEMSEA (Partnerships in Environmental Management for the Seas of East Asia). 2009. "The Marine Economy in Times of Change." *Tropical Coasts* 16 (1). <http://pemsea.org/sites/default/files/tc-v16n1.pdf>.
- PEMSEA. 2015. *Integrated Coastal Management and Sustainable Development of Coasts and Oceans*. Quezon City, Philippines: PEMSEA.
- Popova, E., D. Vousden, W.H.H. Sauer, E.Y. Mohammed, V. Allain, N. Downey-Breedt, R. Fletcher, et al. 2019. "Ecological Connectivity between the Areas beyond National Jurisdiction and Coastal Waters: Safeguarding Interests of Coastal Communities in Developing Countries." *Marine Policy* 104 (June): 90–102. <https://doi.org/10.1016/j.marpol.2019.02.050>.
- Poseidon Principles. 2019. *Poseidon Principles: A Global Framework for Responsible Ship Finance*. Copenhagen: Poseidon Principles. https://www.poseidonprinciples.org/download/Poseidon_Principles.pdf.
- Roberts, C.M., B.C. O'Leary, D.J. McCauley, P.M. Cury, C.M. Duarte, J. Lubchenco, D. Pauly, et al. 2017. "Marine Reserves Can Mitigate and Promote Adaptation to Climate Change." *Proceedings of the National Academy of Sciences of the United States of America* 114 (24): 6167–75. <https://doi.org/10.1073/pnas.1701262114>.
- Rogers, A.D., U.R. Sumaila, S.S. Hussain, and C. Baulcomb. 2014. *The High Seas and Us: Understanding the Value of High-Seas Ecosystems*. Oxford, UK: Global Ocean Commission.
- Roth, N., T. Thiele, and M. von Unger. 2019. *Blue Bonds: Financing Resilience of Coastal Ecosystems: Key Points for Enhancing Finance Action*. Gland, Switzerland: International Union for Conservation of Nature. https://www.4climate.com/dev/wp-content/uploads/2019/04/Blue-Bonds_final.pdf.
- Russ, G.R., A.C. Alcalá, A.P. Maypa, H.P. Calumpong, and A.T. White. 2004. "Marine Reserve Benefits Local Fisheries." *Ecological Applications* 14 (2): 597–606. <https://doi.org/10.1890/03-5076>.
- Russ, G.R., A.J. Cheal, A.M. Dolman, M.J. Emslie, R.D. Evans, I. Miller, H. Sweatman, and D.H. Williamson. 2008. "Rapid Increase in Fish Numbers Follows Creation of World's Largest Marine Reserve Network." *Current Biology* 18 (12): R514–15. <https://doi.org/10.1016/j.cub.2008.04.016>.
- Sala, E., C. Costello, D. Dougherty, G. Heal, K. Kelleher, J.H. Murray, A.A. Rosenberg, and R. Sumaila. 2013. "A General Business Model for Marine Reserves." *PLOS ONE* 8 (4): e58799. <https://doi.org/10.1371/journal.pone.0058799>.
- Sala, E., J. Lubchenco, K. Grorud-Colvert, C. Novelli, C. Roberts, and U.R. Sumaila. 2018. "Assessing Real Progress towards Effective Ocean Protection." *Marine Policy* 91 (May): 11–13. <https://doi.org/10.1016/j.marpol.2018.02.004>.
- Schuhbauer, A., R. Chuenpagdee, W.W.L. Cheung, K. Greer, and U.R. Sumaila. 2017. "How Subsidies Affect the Economic Viability of Small-Scale Fisheries." *Marine Policy* 82 (August): 114–21. <https://doi.org/10.1016/j.marpol.2017.05.013>.

- Schuhbauer, A., and U.R. Sumaila. 2016. "Economic Viability and Small-Scale Fisheries: A Review." *Ecological Economics* 124 (April): 69–75. <https://doi.org/10.1016/j.ecolecon.2016.01.018>.
- Sumaila, U.R. 2010. "A Cautionary Note on Individual Transferable Quotas." *Ecology and Society* 15 (3). <https://www.ecologyandsociety.org/vol15/iss3/art36/>.
- Sumaila, U.R., W. Cheung, A. Dyck, K. Gueye, L. Huang, V. Lam, D. Pauly, et al. 2012. "Benefits of Rebuilding Global Marine Fisheries Outweigh Costs." *PLOS ONE* 7 (7): e40542. <https://doi.org/10.1371/journal.pone.0040542>.
- Sumaila, U.R., N. Ebrahim, A. Schuhbauer, D. Skerritt, Y. Li, H.S. Kim, T.G. Mallory, V.W.L. Lam, and D. Pauly. 2019. "Updated Estimates and Analysis of Global Fisheries Subsidies." *Marine Policy* 109 (November): 103695. <https://doi.org/10.1016/j.marpol.2019.103695>.
- Sumaila, U.R., A.S. Khan, A.J. Dyck, R. Watson, G. Munro, P. Tydemers, and D. Pauly. 2010. "A Bottom-up Re-estimation of Global Fisheries Subsidies." *Journal of Bioeconomics* 12 (October): 201–25. <https://doi.org/10.1007/s10818-010-9091-8>.
- Sumaila, U.R., V.W.Y. Lam, D.D. Miller, L. Teh, R.A. Watson, D. Zeller, W.W.L. Cheung, et al. 2015. "Winners and Losers in a World Where the High Seas Is Closed to Fishing." *Scientific Reports* 5 (February): 8481. <https://doi.org/10.1038/srep08481>.
- Sumaila, U.R., and D. Pauly. 2007. "All Fishing Nations Must Unite to Cut Subsidies." *Nature* 450 (December): 945. <https://doi.org/10.1038/450945a>.
- Sumaila, U.R., C.M. Rodriguez, M. Schultz, R. Sharma, T.D. Tyrrell, H. Masundire, A. Damodaran, et al. 2017. "Investments to Reverse Biodiversity Loss Are Economically Beneficial." *Current Opinion in Environmental Sustainability* 29 (December): 82–88. <https://doi.org/10.1016/j.cosust.2018.01.007>.
- Sumaila, U.R., D. Zeller, L. Hood, M.L.D. Palomares, Y. Li, and D. Pauly. 2020. "Illicit Trade in Marine Fish Catch and Its Effects on Ecosystems and People Worldwide." *Science Advances* 6 (9): eaaz3801. <https://doi.org/10.1126/sciadv.aaz3801>.
- TCFD (Task Force on Climate-related Financial Disclosures). 2020. *Task Force on Climate-related Financial Disclosures Overview*. New York: TCFD. https://www.fsb-tcfd.org/wp-content/uploads/2020/03/TCFD_Booklet_FNL_Digital_March-2020.pdf.
- Teh, L.C.L., and U.R. Sumaila. 2013. "Contribution of Marine Fisheries to Worldwide Employment." *Fish and Fisheries* 14 (1): 77–88. <https://doi.org/10.1111/j.1467-2979.2011.00450.x>.
- Thiele, T., and L.R. Gerber. 2017. "Innovative Financing for the High Seas." *Aquatic Conservation: Marine and Freshwater Ecosystems* 27 (S1): 89–99. <https://doi.org/10.1002/aqc.2794>.
- Thompson, P., and C.J. Cowton. 2004. "Bringing the Environment into Bank Lending: Implications for Environmental Reporting." *British Accounting Review* 36 (2): 197–218. <https://doi.org/10.1016/j.bar.2003.11.005>.
- UNDP (United Nations Development Programme) and GEF (Global Environment Facility). 2012. *Transforming Markets to Restore and Protect the Global Ocean*. Volume 1 of *Catalysing Ocean Finance*. New York: UNDP.
- UNEP FI (United Nations Environment Programme Finance Initiative). n.d. "Sustainable Blue Economy." <https://www.unepfi.org/ecosystems/sustainable-blue-economy-finance/>. Accessed 1 September 2020.
- UNEP FI and PSI (Principles for Sustainable Insurance). 2019. "Underwriting Environmental, Social and Governance Risks in Non-life Insurance Business." PSI Working Paper. Nairobi: UNEP. <https://www.unepfi.org/psi/wp-content/uploads/2019/02/PSI-Guidance-for-non-life-insurance-underwriting.pdf>.
- UN ESCAP (United Nations Economic and Social Commission for Asia and the Pacific). n.d. "Global Dialogue on Ocean Accounting and First Annual Meeting of the Global Ocean Accounts Partnership." https://www.unescap.org/sites/default/files/Global_Dialogue_on_Ocean_Accounting-Draft_Workshop_Report_for_comment.pdf. Accessed 14 January 2020.
- UN-OHRLS (United Nations Office of the High Representative for the Least Developed Countries). 2013. *Small Island Developing States in Numbers*. https://wedocs.unep.org/bitstream/handle/20.500.11822/9271/-Small%20Island%20Developing%20States%20in%20numbers-2013SIDS_IN_NUMBERS_121813_FA_WEB.pdf?sequence=3&%3BisAllowed=
- Vivid Economics. 2020. "Integrating Climate Change and Biodiversity into the Response to COVID-19: Bailout Measures." <https://www.vivideconomics.com/wp-content/uploads/2020/04/200427-greening-COVID-corporate-bailouts.pdf>.
- Waldron, A., V. Adams, J. Allan, A. Arnell, G. Asner, S. Atkinson, A. Baccini, et al. 2020. *Protecting 30% of the Planet for Nature: Costs, Benefits and Economic Implications*. Washington, DC: Campaign for Nature. https://www.conservation.cam.ac.uk/files/waldron_report_30_by_30_publish.pdf.
- Walsh, M. 2018. *Ocean Finance: Definition and Actions*. Honiara, Solomon Islands: Pacific Ocean Finance Program, Pacific Islands Forum Fisheries Agency. https://gallery.mailchimp.com/b37d1411f778c043250da5ab5/files/f1a910e2-32f9-4aed-ad35-e2bccab6cf12/Ocean_Finance_Definition_Paper_Walsh_June_2018.pdf.
- Wharton, J.M.H., and S. Young. Forthcoming. *Pacific Ocean Finance Program—Insurance*. Report by Willis Towers Watson for the Pacific Ocean Finance Program. London, United Kingdom (in press).
- Whisnant, R., and A. Reyes. 2015. *Blue Economy for Business in East Asia: Towards an Integrated Understanding of Blue Economy*. Quezon City, Philippines: Partnerships in Environmental Management for the Seas of East Asia. http://www.pemsea.org/sites/default/files/Blue_Economy_for_Business_in_East_Asia.pdf.
- White, C., and C. Costello. 2014. "Close the High Seas to Fishing?" *PLOS Biology* 12 (3): e1001826. <https://doi.org/10.1371/journal.pbio.1001826>.
- Widjaja, S., H. Wirajuda, T. Long, et al. 2020. *IUU Fishing and Associated Drivers*. Washington, DC: World Resources Institute. <https://oceanpanel.org/sites/default/files/2020-02/HLP%20Blue%20Paper%20on%20IUU%20Fishing%20and%20Associated%20Drivers.pdf>.
- Winther, J.G., M. Dai, F. Douvère, L. Fernandes, P. Halpin, A.H. Hoel, M.A. Juinio-Meñez, et al. 2020. *Integrated Ocean Management*. Washington, DC: World Resources Institute <https://oceanpanel.org/sites/default/files/2020-05/BP14%20IOM%20Full%20Paper%20Final%20Web.pdf>.
- World Bank. 2017. *The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/24056>.
- Wright, G., S. Schmidt, J. Rochette, J. Shackeroff, S. Unger, Y. Waweru, et al. 2017. *Partnering for a Sustainable Ocean: The Role of Regional Ocean Governance in Implementing Sustainable Development Goal 14*. Potsdam, Germany: Institute for Advanced Sustainability Studies; Paris: Institute for Sustainable Development and International Relations. https://www.iddri.org/sites/default/files/import/publications/online_iass_report_report_170524.pdf.
- WWF (World Wide Fund for Nature). 2018. "The Sustainable Blue Economy Finance Principles." <https://www.wwf.org.uk/updates/sustainable-blue-economy-finance-principles>.
- WWF (World Wildlife Fund). 2019. *Risk and Opportunity in the Seafood Sector: The Business Case for Sustainability*. Washington, DC: WWF. <https://seafoodsustainability.org/wp-content/uploads/2019/06/Business-Case-for-Sustainability-2019.pdf>.

Abbreviations

ABNJ	areas beyond national jurisdiction
ADB	Asian Development Bank
CFF	Climate Finance Facility
CZMT	Coastal Zone Management Trust
ESG	environmental, social and governance
EU	European Union
GDP	gross domestic product
IIX	Impact Investment Exchange
ISB	IIX Sustainability Bond
IUU	illegal, unreported and unregulated
MPA	marine protected area
NGO	non-governmental organisation
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
PSI	Principles for Sustainable Insurance
SDG	Sustainable Development Goal
SME	small and medium enterprise
SOE	sustainable ocean economy
TCFD	Task Force on Climate-related Financial Disclosures
TNC	The Nature Conservancy
UN	United Nations
UNEP	United Nations Environment Programme
WWF	World Wide Fund for Nature

Acknowledgements

The authors thank the paper’s technical reviewers, Chip Cunliffe, Klaas de Vos, Justin Mundy and Kelly Wachowicz; its arbiters, Mari Elka Pangestu and Adrien Vincent; as well as the Expert Group co-chairs, who all provided helpful technical comments. The authors also thank World Resources Institute for providing support as the Ocean Panel Secretariat.

Although numerous colleagues were very generous with their time and input, this report reflects the views of the authors alone and does not necessarily reflect the views of the organisations or their countries of employment. Finally, we thank Patricia Tiffany Angkiriwang for the design of Figures 1–3. The authors thank Lauri Scherer for copyediting and Romain Warnault for design.

About the Authors

Lead authors

U. Rashid Sumaila is Professor and Canada Research Chair in Interdisciplinary Oceans and Fisheries Economics at the Institute for the Oceans and Fisheries and the School of Public Policy and Global Affairs at the University of British Columbia.

Melissa Walsh is a Blue Finance Specialist with the Asian Development Bank and also a principal at Marine Conservation Finance Consulting.

Kelly Hoareau is the Director of the James Michel Blue Economy Research Institute at the University of Seychelles.

Anthony Cox is the Deputy Director of the Environment Directorate of the OECD.

Contributing Authors

Patrícia Abdallah is Professor and Acting Director of the Institute of Economy, Administration and Accounting at the Federal University of Rio Grande in Brazil.

Wisdom Akpalu is Associate Professor of Economics and the Dean of the School of Research and Graduate Studies at the Ghana Institute of Management and Public Administration.

Zuzy Anna is the Executive Director of the Center for Sustainable Development Goals Studies at Universitas Padjadjaran in Bandung, Indonesia.

Dominique Benzaken is a Senior Policy Expert and PhD candidate on the sustainable blue economy, ocean governance and islands with the Australian National Centre for Ocean Resources and Security.

Beatrice Crona is Executive Director of the Global Economic Dynamics and the Biosphere Programme at the Royal Swedish Academy of Sciences as well as Associate Professor and Deputy Science Director at the Stockholm Resilience Centre.

Timothy Fitzgerald is Senior Director of Oceans Climate Strategies at the Environmental Defense Fund.

Louise Heaps is the Global Lead on the sustainable blue economy for WWF and is based at WWF-UK.

Katia Karousakis is an environmental economist at the OECD.

Glenn-Marie Lange is a Senior Environmental Economist with the Environment and Natural Resources Global Practice and Chief Technical Adviser at the World Bank.

Amanda Leland is Executive Vice President of the Environmental Defense Fund and oversees programs including climate, energy, health, ecosystems, and oceans.

Dana Miller is a Senior Policy Advisor for Oceana in Europe.

Karen Sack is currently President and Chief Executive Officer of Ocean Unite. She was formerly the Senior Director for International Oceans at Pew Charitable Trusts, where she helped initiate the Global Ocean Commission.

Durreen Shahnaz is the founder and Chief Executive Officer of Impact Investment Exchange in the United States.

Louise Teh is a Research Associate in Interdisciplinary Oceans and Fisheries Economics at the Institute for the Oceans and Fisheries and the School of Public Policy and Global Affairs at the University of British Columbia.

Torsten Thiele is a Visiting Fellow at the Institute of Global Affairs at the London School of Economics and Political Science, where he leads on blue finance, and a Senior Research Associate at the Institute for Advanced Sustainability Studies in Potsdam.

Niels Vestergaard is Professor and Head of the Department of Sociology, Environmental and Business Economics at the University of Southern Denmark.

Nobuyuki Yagi is Professor at the University of Tokyo and Member of the Science Council of Japan.

Junjie Zhang is an Associate Professor of Environmental Economics at Duke Kunshan University and in the Nicholas School of the Environment at Duke University.



HIGH LEVEL PANEL *for*
**A SUSTAINABLE
OCEAN ECONOMY**

10 G Street NE
Suite 800
Washington, DC 20002, USA
+1 (202) 729-7600

oceanpanel.org

Support for this Blue Paper provided by:

