FRIENDS of OCEAN ACTION

The Ocean Finance Handbook

Increasing finance for a healthy ocean

Co-Chairs' foreword

The ocean covers two-thirds of the Earth's surface, and provides great economic, social and cultural value to the lives of billions of people. At the same time, human activity is causing a clear decline in the health of the ocean, with concurrent loss of the existing and potential value of the services and resources we derive from it. That decline is due to the unconscionable levels of pollution we subject the ocean to, our harmful fisheries practices, our unsustainable extraction of its resources, along with human destruction of its habitats and ecosystems. Meanwhile our greenhouse gas emissions continue to escalate, causing rising levels of ocean acidification, deoxygenation and warming, with their attendant problems for life in and around the ocean.

Where there are major challenges, so too are there great opportunities. The ocean has remarkable resilience, with the recovery of whale numbers demonstrating that if we are prepared to change our destructive ways, the ocean's rich environment allows a positive response. We at the Friends of Ocean Action are dedicated to reversing the cycle of decline in which the ocean has been caught. Our activities include championing the sustainable blue economy, believing that if we treat the ocean with respect, it will provide humanity with all the energy, sustenance and health resources required for a secure human future upon this planet.

A blue economy ruled by the principle of sustainability stands against the development of yet another round of linear exploitation of finite planetary resources. Instead, the sustainable blue economy foresees such economic activities as the greening of shipping, offshore renewable energy, carbon sequestration, eco-friendly tourism, genetic marine resources, sustainable aquaculture and the development of new types of marine food as emerging trends in the decades ahead.

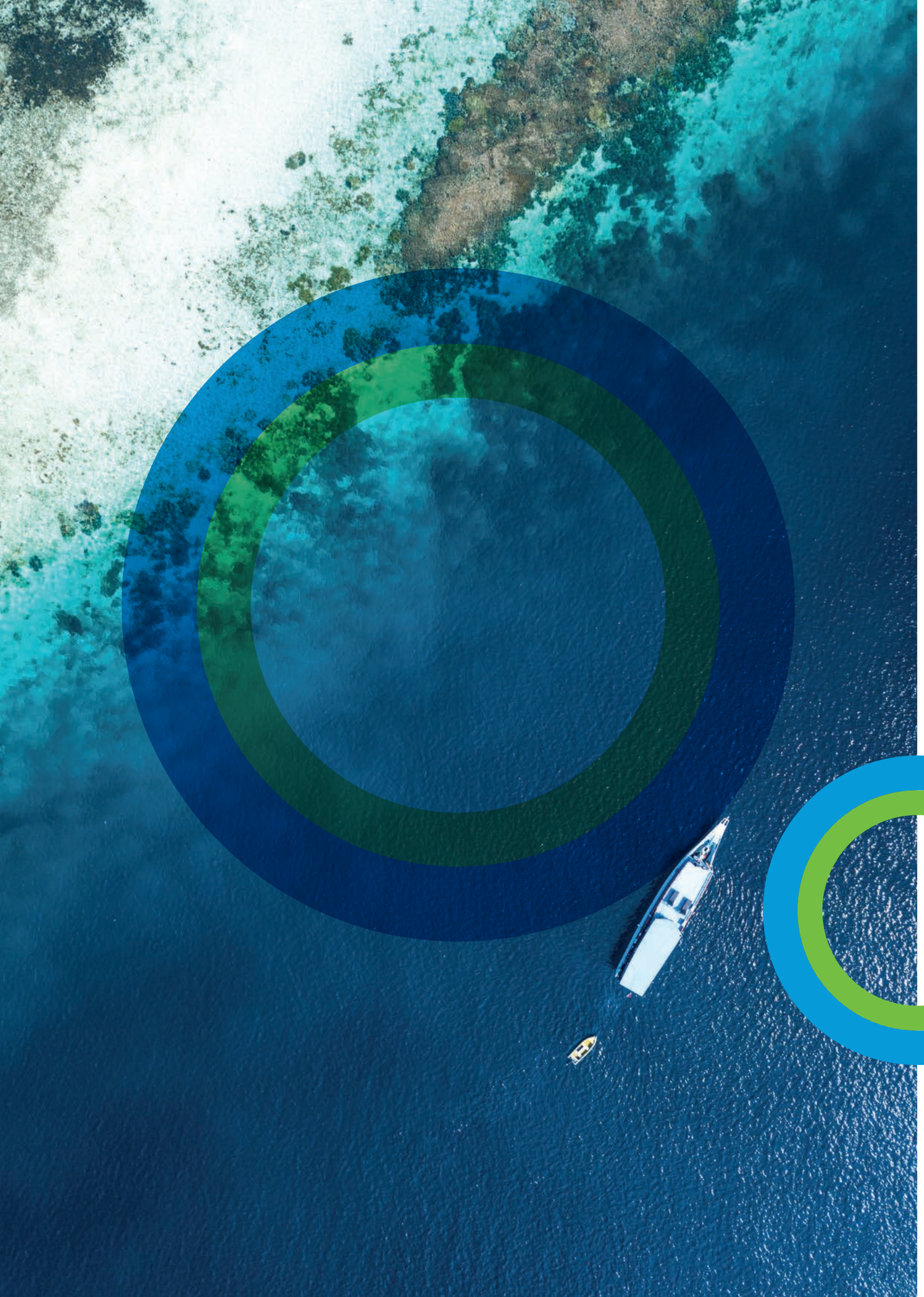
The story today should no longer be one of inevitable deterioration, but one in which the reimagining of our world through the lens of circular and sustainable economies will allow us to implement a prosperous way of life in harmony with Nature. This lens focusses on development of a sustainable blue economy that will ensure our grandchildren and those who come after them, will be able to rely for their well-being on the renewable resources of a healthy ocean.

Finance, the ability to mobilise resources for investment and development, has a central role in this story. Investors, businesses, asset owners and financial institutions the world over are beginning to grasp the importance of investing in a sustainable ocean economy, with the integration of social and environmental impact becoming central to investment decision-making. It is therefore a priority of our times that we develop consensus on the principles and the narrative that will bind the financial world to the multitude of projects awaiting development in the sustainable blue economy.

We believe this Ocean Finance Handbook will lend a guiding hand to those interested in the financing of the sustainable blue economy. The Handbook has been designed to be both practical and ambitious, taking stock of the current ocean-scape of finance and providing an introduction to those seeking to increase their understanding of finance and investment in the sustainable blue economy. By providing a concise summary of the various means by which finance flows to the ocean can be enhanced, we hope the Handbook proves to be a useful resource in the development of the sustainable blue economy.

Peter Thomson
UNSG's Special Envoy for the Ocean
Co-chair, Friends of Ocean Action

Isabella Lövin
Deputy Prime Minister, Sweden
Co-chair, Friends of Ocean Action



About this document

The Friends of Ocean Action, launched at the 2018 World Economic Forum Annual Meeting in Davos, is an informal, multi-stakeholder coalition composed of over fifty of the world's most committed and influential activists, business-leaders and thought-leaders, invited to help shape global action to save life in the ocean. These leaders, jointly convened by the World Economic Forum and the World Resources Institute, are co-chaired by Peter Thomson, the UN Secretary General's Special Envoy for the Ocean, and Isabella Lövin, Deputy Prime Minister of Sweden. Together, they embarked on a three-year initiative to contribute to the achievement of the United Nations Sustainable Development Goal 14 (SDG14) - the Ocean Goal - and advance a set of high level, impactful initiatives and solutions in time for the second UN Ocean Conference, June 2020 in Lisbon, Portugal.

This Handbook forms part of a 'Financing Ocean Innovation' action track developed by Friends of Ocean Action. It seeks to bridge gaps, and effectively foster conversation, between financial institutions and those who, in receipt of investment, may contribute productively to a sustainable blue economy: marine-based businesses, conservation professionals and programme managers.

This Handbook aims to provide an up-to-date overview of the investment landscape in the blue economy, with the intent of providing a common baseline of understanding of sustainable blue economy financing for all stakeholders.

For those seeking finance
This document will serve as a reference for decision makers within governments, NGOs, the private sector, and ocean-based communities who want to understand where – and how – blue finance can be raised, how it can best be managed, and the types of activities that it can enable.

Looking to invest
It will also seek to serve a similar purpose for financial professionals, offering insight into opportunities and considerations for sustainable investment in the ocean.

As an overview of existing practice, it sources heavily from previous synthesis documents on sustainable financing and links out to related and complementary resources wherever possible. The Handbook is designed for use as a reference document, and readers are free to focus on the chapters relevant to their own area of focus.

The Handbook aims to present a wide-lens overview of the current landscape of ocean finance, and serve as a first port of call to understand the state of play of investment in the sustainable blue economy, what this means and who is providing it. It seeks to provide a clear framework for understanding currently available financing options, investable opportunities and mechanisms through which to marry the two.

A suite of best-practice case studies for financing a sustainable blue economy are shared, with key lessons and findings from each identified. These concrete exemplars offer proof points for scaling up sustainable blue economy financing. Through these real-world case studies, this paper seeks to demystify an increasingly complex landscape, providing a current reflection of the nature of this fast-evolving space.

Lastly this report seeks to encourage a dialogue, based on a common understanding of the ocean and of finance between all stakeholders, and contribute to an informed increase in mobilisation of capital, flowing towards the sustainable blue economy.

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List of acronyms

Term	Meaning
BBNJ	Biodiversity beyond national jurisdictions
BC	Blue carbon
BCRC	Blue carbon resilience credit
CBD	Convention on Biological Diversity
CBO	Community-based organisation
CCRIF SPC	Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company
CIB	Conservation Impact Bonds
COAST	Caribbean Oceans and Aquaculture Sustainability Facility
CSR	Corporate social responsibility
CTF	Conservation Trust Fund
DFI	Development finance institution
EDF	Environmental Defense Fund
EEZ	Exclusive Economic Zone
EIB	Environmental Impact Bond
ESG	Environmental, social and corporate governance
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign direct investment
FMO	Netherlands Development Finance Company
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
GIIN	Global Impact Investing Network
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GP	General partner
GVA	Gross value added
HNWI	High-net-worth individual
IFI	International financial institution
IMO	International Maritime Organization
IPO	Initial public offering
IUU	Illegal, unreported and unregulated (fishing)
LNG	Liquified natural gas
LP	Limited partner
MBO	Member-based organisation
MBARI	Monterey Bay Aquarium Research Institute
MDB	Multilateral development bank
MFI	Microfinance institution
MGR	Marine genetic resources
MPA	Marine Protected Area
MSY	Maximum sustainable yield
NGO	Non-governmental organisation
NDC	Nationally determined contributions
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
OTEC	Ocean thermal energy conversion
PES	Payments for ecosystem services
PFP	Pay-for-Performance
PFS	Pay-for-Success
PRI	Principles for Responsible Investment
PSI	Principles for Sustainable Insurance
RLF	Revolving loan fund
SDG	Sustainable Development Goal
SEC	US Securities Exchange Commission
SeyCCAT	Seychelles' Conservation and Climate Adaptation Trust
SIDS	Small Island Developing State(s)
SIFFS	South Indian Federation of Fishermen Societies
SME	Small and medium-sized enterprises
TCFD	Task-force on Climate Related Disclosures
TNC	The Nature Conservancy
UNEP FI	United Nations Environment Programme Finance Initiative
VC	Venture capital
WEC	Wave energy converters

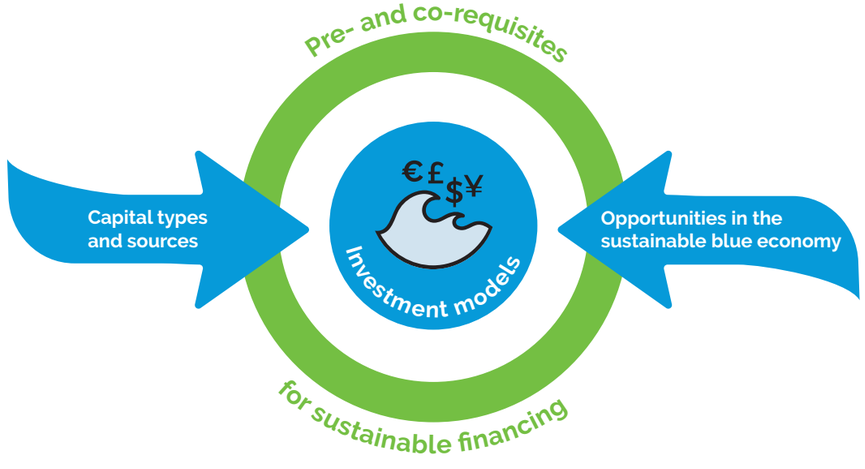
Executive summary

This 'Ocean Finance Handbook' has been developed for Friends of Ocean Action as part of the wider effort to transition towards a sustainable blue economy. The Handbook seeks to provide a reference document to support calls for an increase in finance flowing towards sustainable ocean-based industry and marine conservation. In so doing, the aim is to foster understanding and generate conversations between financial institutions and marine-based businesses, conservation professionals and programme managers.

The report is structured as a guide for a wide and diverse audience: covering, in simple terms, the meaning of 'ocean finance', its current state, and the mechanisms available for investing in different sectors of the blue economy. It discusses, in sequence;

- the **sectors** of the sustainable blue economy and their noteworthy investment trends;
- the **pre- and co-requisites** for financing, and;
- the **types and sources** of investment capital, and finally a selection of the most prominent
- **investment models** available for the sustainable blue economy at time of writing.

A key objective of the Handbook is to build clarity and understanding – central to this is the use of language to describe and define the ocean finance landscape. The language used in relation to the ocean economy is varied, and has become more so in recent years. Terminology that is commonplace in the finance landscape, and therefore used when discussing the blue economy, is also inherently opaque to many members of the conservation community, very few of whom will have been exposed to terms outside of the realm of personal finance. This has presented barriers to the effective definition, classification, and interpretation of scope of the ocean economy (Park, 2014), and subsequently the opportunities it presents. Correspondingly, this has contributed to a lack of coherence in the vocabulary used in the ocean finance sphere itself. The range of terminology encountered can include: ocean economy, the sustainable blue economy, marine economy, maritime economy, and maritime sector - among others. For the purposes of this paper, we use the terms 'sustainable blue economy' and 'blue economy', where the word 'sustainable' provides emphasis of the importance of sustainability. This follows the World Bank definition of the blue economy concept as one that "*seeks to promote economic growth, social inclusion, and preservation or improvement of livelihoods while at the same time ensuring environmental sustainability*" (World Bank, 2017). This is distinct from the broader 'ocean economy' which includes all economic activity taking place in and around the ocean, sustainable or otherwise.



The Handbook includes five case studies that demonstrate how finance has been structured for specific sectors of the sustainable blue economy, showcasing through real-world examples how different investment models and opportunities for impact can align.

These case studies, spread throughout the paper, feature insights into innovative structures or approaches in the realms of: **impact investing**, **parametric insurance**, using **philanthropic capital**, **seed investment**, and **bond issuances**.

CASE STUDY	SECTOR FOCUS	INVESTMENT TYPE	CAPITAL PROVIDERS	CAPITAL TYPE
Quintana Roo Trust	Protected area financing; payment for ecosystem services	Endowment fund	Blend of corporations, philanthropy, ODA	**Grant**
Katapult Ocean	Broad range, with technology focus	Early-stage impact, combined with accelerator	Blend of pension funds, impact funds, family offices and foundations	**Equity**
Conservation International Ventures	Fisheries and aquaculture	Impact fund	High-net worth individual donors and philanthropy	**Debt**
Circulate Capital Ocean Fund	Waste management	Early-stage venture capital	Blend of ODA, philanthropy	**Equity**
Ørsted Gode Wind 1	Ocean-based renewable energy	Project bond	Pension funds, banks, sovereign wealth funds	**Debt**

Opportunities in the sustainable blue economy

The first chapter of the Handbook looks at the main opportunities in the sustainable blue economy, their economic performance and primary investment opportunities, divided across three broad categories of **natural capital**, **commodities** and **marine and coastal development**.

Investment in the ocean, in one form or another, is not a new idea. Human development has always been closely linked to the exploitation of the ocean, and certain sectors (including fishing and shipping) have received substantial investment throughout history.

As such, there is a distinction to be made within the sustainable blue economy landscape between:

- existing sectors within the economy that require redirection of capital, supplemented by new financing, towards sustainability (common in commodities and marine and coastal development, with fishing and shipping being good examples), and;
- the development of new sectors for investment, and more innovative approaches to financing conservation (including, for example, blue carbon and natural infrastructure).

Throughout this chapter, these differences are outlined as **established** or **emerging** sectors of the blue economy.

Looking towards a 2030 horizon, many industries of the ocean economy are widely forecast to outpace global economic growth, in employment and GVA terms; and projections suggest the ocean economy could double in GVA terms – reaching in excess of US$3tn (OECD, 2016). Marine aquaculture, offshore wind, fish processing, and shipbuilding were identified as the industries forecast to demonstrate the strongest growth over this period.

Pre- and co-requisites

The second chapter explores a number of prerequisites for successful investment, without which finance is unlikely to flow. These are subdivided across **governance structures**, the **investment climate**, and **knowledge and innovation**, with an indication as to whether these requisites are driven by the public or private sectors. While the paper highlights several foundational requirements for effective financing, among the most vital are:

- Public sector-led policy frameworks for the development of a sustainable blue economy;
- A favourable investment climate, providing a legal basis for investment, ease of doing business, and liquidity;
- Financial literacy and business planning capacity, to support the development of investment-ready projects and pipeline.

Capital types and sources

Chapter three of the Handbook considers capital types and sources for investment. Capital types and sources vary, dependent on investors' risk and return expectations, scale, and desired level of impact (non-financial return). Investment in the blue economy space is comprised of public and private capital, complemented by philanthropy, each with a distinct offering and applicability in different contexts for emerging and established sectors of the blue economy.

In emerging sectors of the blue economy, which require new investment capital, the overwhelming source of existing funding continues to be **philanthropy** (over US$8 billion in the last 10 years) and **official development assistance** (ODA, US$5 billion in the last 10 years). However, growing appetite in the **venture capital** and **impact investment** communities for ocean investments has resulted in the establishment of a number of new funds in recent years. In established areas of the blue economy, a key trend is the **redirection of commercial capital** - flowing towards sustainable activity such as fisheries reform or low-carbon shipping.

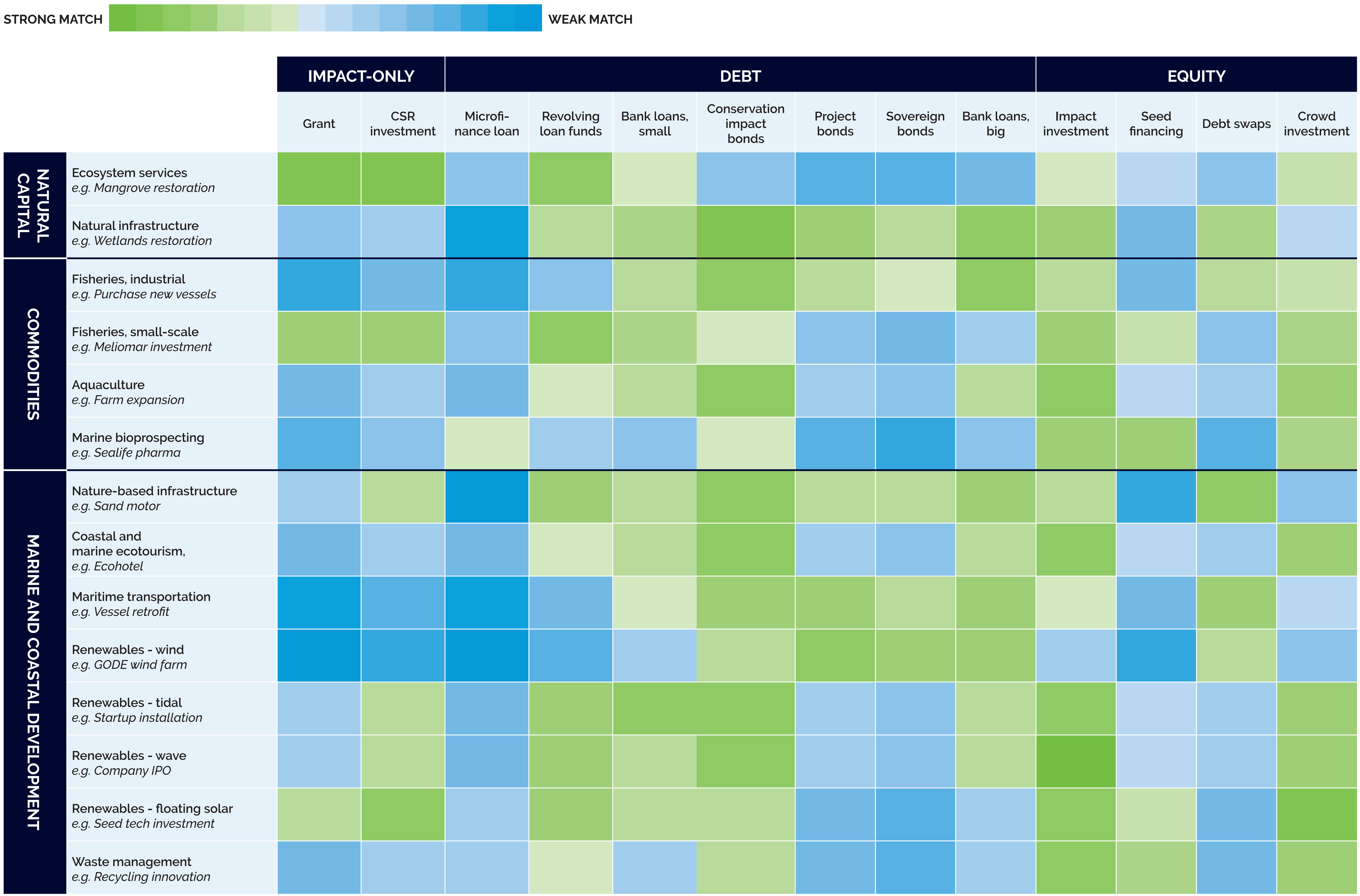
Investment models

Chapter four aims to provide an overview of the existing financing models used for investment in a sustainable blue economy. This includes some of the most prominent forms of mainstream finance (notably bank loans and project bonds) as well as more innovative structures for financing ocean conservation and impact (such as conservation trust funds, impact bonds and crowd financing). These are organised as **impact-only**, **debt**, **equity** and **hybrid** models, following the characteristics set out in chapter three.

This chapter highlights the importance of aligning scale, risk, and return when it comes to blue economy investment and encourages a more nuanced approach to blue financing that reduces the reliance on popular but often misunderstood terms such as 'blue bonds'. While blue bonds are promising, they are not universally applicable. Other noteworthy investment models that receive focus are **seed investment** in promising start-ups, **impact investing** in commodities, and the development of **conservation trust funds** for more natural capital-focused projects. These are all picking up momentum as the need and opportunity for finance in the blue economy becomes clearer.

The following heat map provides an illustration of the alignment between major types of financing covered in this paper and example investments into sectors of the blue economy, for an average compatibility of scale, risk and risk tolerance, and return potential. It provides some indication as to the best models for investment for different types of projects in different sectors, though please note that this is a subjective and indicative mapping, based on the limited available data. Many variables, including how common and mainstream an investment mechanism is, are not captured and will influence the applicability of a given model in a given context.

This heat map has been designed to provide an indication of the 'goodness of fit' between specific (either real or hypothetical) investment projects in sectors of the blue economy and different investment models. The map measures the difference in tolerances for risk, return and scale between the projects and models, where the greater the difference in tolerance, the higher the number and bluer the colour on the map. Where tolerances align (for example, both the investment model and the project have similar requirements for scale, risk and level of return), the resulting number in the heat map is low, resulting in a green colour. For further information regarding the heat map please see Annex 1 at the conclusion of this report.


STRONG MATCH
WEAK MATCH
IMPACT-ONLY
DEBT
EQUITY
Grant
CSR investment
Microfi-nance loan
Revolving loan funds
Bank loans, small
Conservation impact bonds
Project bonds
Sovereign bonds
Bank loans, big
Impact investment
Seed financing
Debt swaps
Crowd investment
NATURAL CAPITAL
Ecosystem services e.g. Mangrove restoration
Natural infrastructure e.g. Wetlands restoration
COMMODITIES
Fisheries, industrial e.g. Purchase new vessels
Fisheries, small-scale e.g. Meliomar investment
Aquaculture e.g. Farm expansion
Marine bioprospecting e.g. Sealife pharma
MARINE AND COASTAL DEVELOPMENT
Nature-based infrastructure e.g. Sand motor
Coastal and marine ecotourism, e.g. Ecohotel
Maritime transportation e.g. Vessel retrofit
Renewables - wind e.g. GODE wind farm
Renewables - tidal e.g. Startup installation
Renewables - wave e.g. Company IPO
Renewables - floating solar e.g. Seed tech investment
Waste management e.g. Recycling innovation

Key messages

It is clear from the literature supporting the development of the Ocean Finance Handbook that the scope of investment models available for a sustainable blue economy is broad. Nevertheless, in terms of available financing and the scale of investment, the blue economy continues to lag behind its terrestrial counterpart – largely as a result of crucial missing prerequisites such as political willingness and financial literacy. Additionally, the nascent status of the sustainable blue economy and more generalised challenges related to finance in the developing world, where many of the emerging blue economy sector opportunities lie, present further hurdles to overcome. As clearer governance frameworks and technological innovations for investing in sustainability emerge, and financial literacy and business planning capacity builds, many of the existing barriers to investment in the sustainable blue economy may be overcome.

Five key messages from the Ocean Finance Handbook

1. **We all need to speak the same blue economy language.** Use of the right language is key to the successful development of investment for the blue economy; bonds, loans, and equity have specific meaning and must be used in the right context to build understanding and investor engagement. This may require capacity building within the conservation sphere to develop finance 'fluency'.
2. **Political willingness will be a bedrock to progress in ocean finance.** Many prerequisites for successful financing exist, but the most significant to have in place include political willingness to innovate and build governance around investment, as well as financial literacy, and the ability to plan business growth for project pipeline.
3. **The financial system is yet to realise the full extent of sustainable blue economy opportunities.** Even with the existing availability of investment models for the blue economy, the scale of investment in sustainability is low and remains dominated by philanthropy (US$ 8.3 billion) and official development assistance (US$ 5 billion), particularly in emerging sectors. This is in line with recent studies that suggest that Goal 14 of the Sustainable Development Goals on 'life below water' has received the least amount of investment out of all Goals, suggesting that the financial system continues to struggle to recognise and value the capital and services provided by, and dependent on, the ocean.
4. **Significant opportunities exist for private investment in emerging sectors of the blue economy.** Correspondingly, significant opportunities for private investment exist in emerging sectors of the blue economy in the realm of impact investing and venture capital; scale and risk tolerance make larger-scale investment (such as blue bonds) the exception, rather than the rule. Redirecting existing capital flows towards sustainable practice and incorporating sustainability considerations into mainstream finance are particularly relevant for the established sectors of the blue economy.
5. **More transparency in existing capital investment is needed to gain a clear picture of the blue economy as it stands.** Capital flows, notably private capital, are often not disclosed voluntarily and when they are they tend not to be disaggregated along blue economy lines; this remains a significant impediment to clarifying the current state of blue economy financing and provides an area for significant further work.

Introduction

The ocean covers two-thirds of the Earth's surface, and is an increasingly critical source of resources, both renewable and non-renewable, to the world's growing population. It provides food, jobs and livelihoods to over three billion people, and facilitates our globalised trading economies. Coastal areas are home to nearly 2.4bn people, with coastal regions forecast to exhibit high rates of urbanisation, population and economic growth in the future (Hugo, 2011; Neumann et al., 2015). Our ocean provides a suite of ecosystem services, vital to the functioning of society and fundamental to the sustaining of life. It is our largest carbon sink, having absorbed 30% of anthropogenic carbon dioxide (CO_2) emissions as well as 93% of excess atmospheric heat from anthropogenic greenhouse gas emissions (IPCC, 2013). The ocean is also a critical source of oxygen – estimated at over 50% of global production, a far greater quantity than from forests.

Yet we are causing widespread harm to this planetary lifeline. Human activities have pushed marine species and their ecosystems to the brink. Actions by humans have severely altered 66% of the marine environment (IPBES, 2019). Climate-related impacts are causing seas to warm, rise and acidify (IPCC, 2019). We are squandering our biggest buffer against climate change, a vital source of food and the largest natural resource on the planet. Protected and sustainably managed, the ocean can continue to function as the Earth's lungs, as a source of food and employment – and as a source of prosperity (Rayner, Jolly and Gouldman, 2019).

Nevertheless, awareness of the key services and provisions provided by the ocean is increasing, as well as the recognition that continued ocean health decline inhibits prosperity. Public and non-governmental organisation (NGO) actors are increasingly vocalising the need for greater investment to safeguard the health of the ocean. At the same time, financial institutions and investors are increasingly realising – and are attracted to – the opportunities available to them through investment in a healthier ocean – notably the eight fundamental steps needed to restore ocean health recently articulated[1] in Laffoley et al (2019). In short, there is a greater awareness from all actors of the need to shift capital flows to sustainable ocean solutions that benefit both economies and the ocean environment. Correspondingly, this has led to a growth in interest in investment, and an increasingly complex financial landscape has developed through which ocean finance is being explored and disbursed (Blasiak et al., 2019). One driver of increased interest in the blue economy has been the emerging integration of ocean issues into internationally agreed conservation and development goals and their targets – most notably the inclusion of ocean issues into the Sustainable Development Goals (SDG) framework in Goal 14: Life Below Water.

1 These include: addressing climate change; securing a High Seas Treaty; enforcing standards for effective marine protected areas (MPAs) and extending their scope to fully protect at least 30% of the ocean; adopting a precautionary pause on deepsea mining; ending overfishing and destructive practices including illegal, unreported and unregulated (IUU) fishing; reducing marine water pollution; providing a financing mechanism for ocean management and protection; and scaling up scientific research on the ocean and increasing accessibility of data (Laffoley et al, 2019).

Defining the blue economy & assessing opportunities

The language used in relation to sustainability and the ocean is varied, and this variety has grown in recent years, which has presented obstacles in the effective definition, classification and scope of the blue economy (Park, 2014). The range of terminology encountered can include: ocean economy, sustainable blue economy, marine economy, maritime economy and maritime sector, some of which exclude certain sectors (notably the extraction of non-renewables). For the purposes of this paper, we use the terms 'sustainable blue economy' and 'blue economy', where the word 'sustainable' provides emphasis of the importance of sustainability. This follows the World Bank definition of the blue economy concept as one that "seeks to promote economic growth, social inclusion, and preservation or improvement of livelihoods while at the same time ensuring environmental sustainability" (World Bank, 2017). This is distinct from the broader 'ocean economy' which includes all economic activity taking place in and around the ocean, sustainable or otherwise. Our definition explicitly excludes the extractive sectors such as offshore oil and gas as well as deep-sea mining. It is distinct from the broader 'ocean economy' which includes all economic activity taking place in and around the ocean, sustainable or otherwise.

This categorisation and framing for ocean-based industry and economic activity is gaining traction. An important development in this space was the creation of the Sustainable Blue Economy Finance Principles spearheaded by the European Commission, European Investment Bank, WWF and The Prince of Wales's International Sustainability Unit. The Principles seek to ensure activities undertaken under the umbrella term of 'ocean finance' conform to an agreed set of focused standards and formats for sustainable investment (European Union, 2018). Their resulting 14 principles target the investor and finance community, and are designed to point the way to what sustainable investment in the blue economy should look like. Their development also considered pre-existing environmental, social and governance (ESG) finance principles, focused on ensuring alignment and harmonisation. The goal of the principles is to drive long-term value whilst mitigating negative impact on 'marine ecosystems, on efforts to reduce carbon emissions, or on ocean-based businesses of all sizes and the livelihoods of people who depend on them'. As such, this paper advocates the use of the Sustainable Blue Economy Finance Principles when assessing sustainable blue economy investments.

In considering the blue economy in the context of investment, it is also important to recognise that investment in the ocean is not new: human development has always been closely linked to the exploitation of the ocean, and certain sectors including fishing and shipping have received investments throughout history. As such, there is a distinction to be made within the sustainable blue economy landscape between relatively mature sectors requiring redirection of existing capital towards sustainability, supplemented by new financing (common in commodities and marine and coastal development) as well as the development of new sectors and more innovative approaches to financing conservation (including, for example, blue carbon and natural infrastructure). To clarify this distinction, this paper introduces two additional terms – for mature blue economy sectors requiring redirection of investment capital we use the 'established blue economy'. Newer sectors, focused on innovation and tackling more recent challenges, are the 'emerging blue economy'.

Opportunities in the sustainable blue economy

Funding directed towards what we now refer to as the 'sustainable blue economy' has historically come primarily from public and philanthropic sources. At the same time, the private sector has made substantial investments in more 'traditional' sectors of the ocean economy, such as shipping and unsustainable fishing, which need redirection of capital towards sustainable alternatives to reduce damage to the marine environment. It is widely recognised, however, that there exists a major financing deficit in the fight to limit the decline of biodiversity and – by extension – the sustainable use and conservation of ocean resources (OECD, 2019; Wabnitz & Blasiak, 2019). While similar figures for the ocean are difficult to derive, a 2014 report estimated the deficit in terrestrial conservation finance to stand at $300bn (Credit Suisse, WWF & McKinsey & Company, 2014). The need for speed and scale in provision of finance to address this deficit – and to conserve, sustainably use, and restore marine ecosystems – has been recognised by the private sector (OECD, 2019).

In order to realise the full potential of the sustainable blue economy, and facilitate this expansion in investment, there is a need for informed and sustainable approaches, and clarity. At present, the diverse approaches and definitions used in the context of ocean finance risk generating confusion, incoherence and suboptimal outcomes (Wabnitz & Blasiak, 2019). This paper seeks to build this clarity and promote a common use of language for exploring the opportunities and challenges in the ocean finance space.

Throughout the rest of this paper, we provide an overview of the key sectors of the sustainable blue economy, emerging and established, and their scales; set out the pre- and co-requisites for sustainable financing, and offer a primer on different capital types and their sources. We then set out a number of the most promising models available for financing a sustainable blue economy, where they are applied and under what conditions. It concludes with a brief summary of the current landscape and key questions to consider for future work in this space. A glossary is provided, describing the key terms and concepts used in this paper.

Placing a price or value on many of the ocean's intangible services and assets is challenging. Aggregate figures looking at the value of the ocean as a whole are scarce, and it is difficult to differentiate between:

- **flow values** (including economic activity using the ocean, as well as ecosystem services such as oxygen production, itself priceless but un-investable);
- the **stock values** of untapped assets (such as marine genetic diversity), and;
- **exploited assets** (such as fisheries).

Recent years, however, have seen an increase in efforts to quantify the value of the ocean as a driver of economic growth, jobs and innovation – seeking to assess the total sum of goods and services provided by it – at both a global and regional scale. A 2010 study, performed by the OECD, conservatively estimated the *ocean* economy (i.e., encompassing all economic activity in the ocean, rather than the specific sectors of the blue economy) provided US$1.5 trillion Gross Value Add (GVA) – equating to 2.5% of global GVA (OECD, 2016). Note that this is a measure of flow that doesn't quantify the value of underlying assets nor the essential ecosystem services provided by the ocean.

Full-time employment directly associated with the ocean economy was calculated at 31 million jobs in 2010 (OECD, 2016). Regional estimates include those calculated by the European Union, which estimated that their 'Blue Economy' provided for €180bn in GVA in 2017 (European Commission, 2019). Other studies have valued the ocean's asset base at a total of US$24 trillion – placing it as the world's seventh largest economy – with an 'Annual Gross Marine Product' of US$2.5 trillion per annum (Hoegh-Guldberg, 2015).

Looking towards a 2030 horizon, many industries of the ocean economy are widely forecast to outpace global economic growth, in employment and GVA terms, and projections suggest the ocean economy could double in GVA terms in this time – reaching in excess of US$3 trillion (OECD, 2016). Marine aquaculture, offshore wind, fish processing, and shipbuilding were identified as the industries forecast to demonstrate the strongest growth over this period.

A note on climate change

The ocean is disproportionally affected by increasing greenhouse gas emissions in the atmosphere, absorbing the majority of the atmosphere's carbon dioxide (some of which, in reaction with marine water, forms carbonic acid, the basis of ocean acidification) and thermal energy (water has a much higher specific heat capacity than air, and has been acting as a buffer for warming for several decades, storing thermal energy as the planet warms). As a result, anthropogenic greenhouse gas (GHG) emissions have altered the function of the marine environment, with projected increases in global mean temperature and concurrent ocean acidification, deoxygenation, and sea-level rise likely to further impact key ecosystems and their services (Gattuso et al., 2015).

The IPCC's Special Report on the Ocean and Cryosphere in a Changing Planet clearly articulated the necessity for the climate emergency to be addressed as a matter of international urgency, in order for the provisioning, regulating and supporting services provided by the ocean to be preserved (IPCC, 2019). Furthermore, limiting warming to a 1.5˚C threshold is projected to reduce ocean temperature rise, deoxygenation, biodiversity and fishery productivity decline. Crucially, the IPCC recognise that the function of marine ecosystems, and their services provided to humankind, will be placed under a greater risk of decline should global warming not successfully be limited to 1.5˚C (IPCC, 2018).

Climate change threatens to exacerbate and accelerate many of the other drivers of ocean health decline caused by the increasing anthropogenic footprint on our ocean. In this context, whilst the content of this chapter looks at the opportunities and needs of each sector of the sustainable blue economy, it must be stressed that anthropogenic climate change acts as an overarching driver of ocean health decline (ROCA Initiative, 2018), and risks limited realisation of the sustainable blue economy's potential economic return if unabated.

Despite these challenges, this chapter will aim to set out, at a high level, the opportunities and challenges presented in key sectors of the sustainable blue economy, broadly categorised into sectors dealing with **natural capital, commodities** and **marine and coastal development**. Each sector will also be classified as **established** or **emergent**, with implications for its growth and investment opportunities.

Key

Throughout this chapter, symbols are used to show key factors for each example investment. These symbols indicate levels for: project scale; perceived risk of investment; return potential, and the development stage of the blue economy sector the investment falls within.

PROJECT SCALE

Project scale is ranked based on size of investment by:
US$<50k; US$50k-US$500k; US$500k-US$1m; US$1m-US$10m; US$10-100m; US$ >100m.

PERCEIVED RISK

The risk thermometer symbol ranks perceived risk from 'very low' through to 'very high'.

RETURN POTENTIAL

The growing pot plant symbol shows the return potential for each example investment, this covers everything from 'not applicable' through to 'very high'. In between, we have: conservative, market average, above average, and high.

DEVELOPMENT STAGE

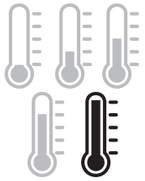
As described on page 6 of this Handbook, and used throughout, sustainable blue economy sectors are divided based on whether they are 'established' (where existing capital flows need to be redirected to move the dial on sustainability, denoted by several fish) or 'emergent' (new areas for investment denoted by one fish).

Natural capital

Natural capital sectors are those where development and investment flows into the natural assets that underpin ecosystem services. Because these services are universal, the beneficiaries extend beyond the individual investor, which distinguishes natural capital from commodities. As they rely on natural assets, they focus on conservation and restoration of natural systems and don't involve the creation of new built structures, distinguishing them from marine and coastal development. Natural capital is not an area of traditional investment, and as such the perceived risks of investment are relatively high, with innovative approaches to investment required to enable capitalisation.

PROJECT SCALE

PERCEIVED RISK



RETURN POTENTIAL

DEVELOPMENT STAGE

Ecosystem services

Example investment: Hypothetical community-based mangrove restoration project[2]

Beyond the physical, traded commodities that the ocean provides to the global economy, it generates less tangible direct and indirect benefits. These benefits are collectively termed ecosystem services, and can be provided at both global and local scales. They include: the ecological basis for goods provided (termed *provisioning services*), such as fish, marine genetic material and other raw materials (covered in the commodities section below); *regulating services*, which for marine and coastal ecosystems include climate regulation, pollution control and natural hazard protection, and; *cultural services*, wherein marine and coastal habitats hold important cultural value, offering aesthetic, religious, and emotional significance.

To help capture these largely intangible benefits provided by ecosystems, Payment for Ecosystem Services (PES) refers to transactions where users of an ecosystem service contribute financially to the stewards of said service[3]. These contributions are directed towards the conservation of resources, and often work by addressing environmental externalities associated with the exploitation or use of the ecosystem service in question. PES thus adopts a market-based approach to conservation financing.

PES has been widely used in terrestrial environments - however, its application to marine environments poses a challenge due to the common pool and transboundary nature of many ocean-based ecosystems services (Bladon, Mohammed and Milner-Gulland., 2014). As such, they remain an emerging sector in the blue economy - challenges of data scarcity, scale, interconnectivity and the complexity of calculating service value remain (Townsend et al., 2018). Nevertheless, there are known applications for PES in the marine realm, including compensation for lost earnings of fishers as a result of an implemented management plan (such as a Marine Protected Area (MPA) or a 'closed season'); or for costs associated with transitioning towards a new gear type.

2 Similar in concept to Conservation International and Apple's partnership for mangrove restoration in Cispata Bay, Colombia. www.apple.com/newsroom/2019/04/conserving-mangroves-a-lifeline-for-the-world.

3 As a concept, PES seeks to link how humans value a service to changes in how an ecosystem functions due to exploitation. But calculation of this link is a fundamental challenge for many intangible ecosystem services provided for by the ocean. As such, some calculations are made through contingent valuation – where a user defines their willingness to pay for the continuation of an ecosystem service, or be compensated for its loss.

Carbon sequestration

An ecosystem service of particular note, where the ocean has a large potential role to play, is carbon sequestration. Coastal ecosystems (notably mangroves, seagrass meadows and salt marshes) provide high potential capacity for carbon sequestration over long timescales. Carbon sequestered in these ecosystems is commonly termed blue carbon. Beyond their carbon sequestration potential, blue carbon ecosystems provide co-benefits; to fisheries (acting as important spawning grounds) and through enhanced coastal protection (through reducing the impacts of storm surges), among others.

A PES for carbon sequestration is most commonly referred to as a carbon offset, and is traded in carbon markets in the form of a carbon credit, representing one tonne of carbon dioxide or equivalent GHGs (tCO2e). Two types of carbon market exist – regulatory compliance and voluntary. The former is regulated under mandatory national, regional or international carbon reduction agreements – for example the Kyoto Protocol's Clean Development Mechanism. Historically, these markets have posed high administrative burdens on projects, and blue carbon projects are few and far between.

Voluntary carbon markets have offered a more flexible and accessible option, with less administrative burden and lower barriers to entry. It is here where blue carbon projects can more readily be found. Market standards, including Plan Vivo and the Voluntary Carbon Standard, have also helped facilitate this. There now exist investable project opportunities for voluntary carbon offsetting, through mangrove protection and reforestation. For example, in Tahiry Honko, Madagascar, Blue Ventures have initiated the world's largest mangrove carbon conservation project. Corporate social responsibility funding has also been deployed to similar projects, with Apple partnering with Conservation International in Cispatá Bay, Colombia.

Regulatory compliance carbon markets could soon become more accommodating of blue carbon projects. With the adoption of the Paris Agreement, countries must prepare Nationally Determined Contributions (NDCs), containing climate related targets, policies and measures in response to climate change, every five years. Many are increasingly seeking to incorporate the contributions from nature-based solutions, such as blue carbon sequestration, into these NDCs. Article 6 of the Paris Agreement enables cooperation in the achievement of a country's NDCs; allowing for both countries (Article 6.2) and "public and private entities" (Article 6.4) to transfer emissions reductions through market-based mechanisms. New possibilities for coastal blue carbon are, therefore, on the horizon. The exact rules of these cooperative approaches remain in negotiation, at the time of writing.

PROJECT SCALE

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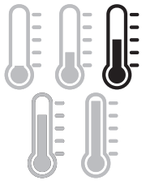

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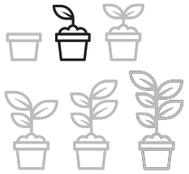


DEVELOPMENT STAGE

Natural infrastructure

Example investment: Proposed restoration of Louisiana wetland ecosystems for flood defence[4]

Natural infrastructure is an emerging sector of the blue economy, focused on the role nature can play in providing infrastructure for human development. As discussions on 'green' and 'nature-based' infrastructure are still relatively young, terminology is inconsistent. Nevertheless, there are a number of terms for the interface between man-made and natural infrastructure and services that are worth clarifying – here, we focus on natural and nature-based solutions[5]:

- **Natural infrastructure,** where nature provides ongoing services at no upfront cost (e.g. through the role mangroves and coral reefs play in defence against storm surges)
- **Nature-based/nature-engineered infrastructure (see below entry under marine and coastal development)**, a hybridised approach where development looks to nature or a natural solution to meet infrastructure needs. Water filtration based on natural filtration methods would be an example of nature-based infrastructure.

In coastal and marine environments, natural infrastructure includes: coral reefs, beaches, seagrass beds and meadows, mangroves and dunes. The ecosystems underpinning natural infrastructure play a crucial role in the protection and stabilisation of shorelines, erosion control, and storm and flood protection. Accounting for these ecosystem services as part of existing infrastructure is an emerging method for incorporating natural infrastructure into development plans.

Calculating the economic value of benefits provided by natural infrastructure is key to safeguarding natural systems alongside human development. Coastal wetlands in the United States have been calculated to have provided US$23.2 billion per year in storm protection services since 1980 (Sutton-Grier, 2015). As a result, wetland restoration and protection can be considered a cost-effective approach to reduce the impacts of storm damage – in such a way that can also enhance the efficacy of traditional infrastructure. Unlike nature-based infrastructure, natural infrastructure relies directly on the natural environment and offers limited opportunity for upfront infrastructure investment, requiring a more holistic approach to integrating the value of the natural environment, alongside traditional infrastructure, in an investment – and focusing on the savings that can potentially be generated where natural infrastructure out-performs man-made equivalents.

4 https://static1.squarespace.com/static/5d5b210885b4ce0001663c25/t/5d8bb6f708c622711b12df3c/1569437432026/EIB_factsheet.pdf

5 Other terms used in this space include 'Green infrastructure', which takes advantage of nature's design to mitigate impacts of infrastructure, often in an urban context, and 'low-carbon infrastructure', which isn't necessarily green, natural or nature-based but serves to provide a low-carbon alternative to traditional infrastructure development.

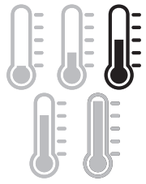
Commodities

Commodity sectors are those where human activity produces (or harvests) a physical good from the ocean. Goods can be freely moved around, distinguishing them from marine and coastal development, which is based on creating fixed assets. They are also predicated on removing assets from the natural environment, distinguishing them from natural capital. Unlike natural capital, investment beneficiaries are not universal. Many commodities (notably seafood) have received investment for centuries, and much of the conversation relating to sustainable investment pertains to redirecting existing investment towards sustainability in addition to seeking new sources of capital. Other commodities, notably marine genetic resources, are newer and more reliant on new capital sources.

Example investment (industrial)

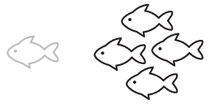
PROJECT SCALE

PERCEIVED RISK



RETURN POTENTIAL

DEVELOPMENT STAGE



Wild-caught marine fisheries

Example investment (industrial): Hypothetical purchase of new industrial vessels in a quota-based fishery[6]

Example investment (small-scale): Development of aggregated fish processing site, sourcing from multiple small-scale fisheries[7]

Fishing specifically refers to the catch of wild fish populations, and is the last hunter-gatherer activity at industrial scale on the planet. Here we refer exclusively to marine fishing, as freshwater fishing in lakes and rivers is not considered a part of the blue economy. It is distinct from aquaculture (see below), which refers to the farming of fish. Fishing is one of the world's oldest industries, and a sector that has received investment since antiquity. As such, it is a prime example of an established blue economy sector, where historic investment has resulted in overfishing, and a new approach to investment is required to transition the sector to sustainability.

It is important here to observe a substantial distinction with the sector between large-scale industrial fishing and small-scale fishing. Whilst industrial fishing is typically export-oriented with highly centralised fishing effort on a small number of vessels and few individual fishers, small-scale fishing is much more subsistence-oriented, with substantially more individual fishers with decentralised fishing effort. While from a macro perspective both industrial and small-scale fishing offer opportunities for a sustainable blue economy, we have disaggregated these types of fishing in the analysis of investment as the parameters for each are distinct.

6 Based on example purchase in Russia: www.undercurrentnews.com/2019/07/19/new-vessels-factories-take-russian-fishery-investment-portfolio-over-1-1bn/

7 Based on the Meloy Fund's Meliomar investment in the Philippines: www.seafoodsource.com/news/supply-trade/rare-s-meloy-fund-invests-in-filipino-seafood-firm-meliomar

Example investment (small-scale)

PROJECT SCALE

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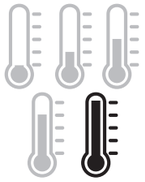

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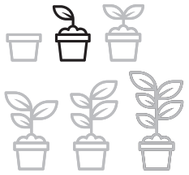
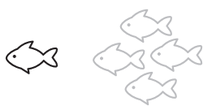


DEVELOPMENT STAGE



Fish constitutes a crucial source of animal protein and essential micronutrients, and provides 3.2 billion people with approximately 20% of their daily intake of animal protein (FAO, 2018). Yet over-exploitation of fishery resources is one of the major pressures on marine biodiversity. Nearly 90% of global fish stocks are now fully exploited, overexploited or depleted (FAO, 2018). Reported production volumes have plateaued at approximately 80 million metric tons for the last thirty years, and in spite of technological advances and growing fishing effort, fishing efficiency is now lower than it was in 1950 – suggesting sharp declines in ocean biomass (Bell, Watson & Ye, 2016). Fisheries can be prone to exceeding legal catch levels due to Illegal, Unreported and Unregulated (IUU) activity, perverse subsidies distorting the economics of fishing, neglect of small-scale fisheries data capture and discarding of accidentally caught fish, known as bycatch (Pauly and Zeller, 2016). IUU activity in particular has been estimated to land between 11-26 million metric tonnes of illegal fish, with economic losses estimated to fall between US$10 – US$35 billion annually (Agnew et al., 2009).

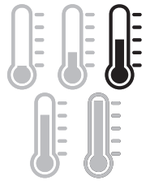
Poor and mis-management of global marine fisheries was estimated in 2012 to lead to lost revenues totalling US$83bn (World Bank, 2017); an increase from US$52bn in 2004 (World Bank & FAO, 2009). These 'sunken billions' were derived from estimates on potential annual revenues should global fisheries be allowed periods for stock recovery, followed by more productive and sustainable fishery practices at their maximum sustainable yields (MSY).

These figures compellingly suggest that, when sustainably managed and allowing for stock recovery, marine fisheries can provide a major source of food for billions of people whilst providing for greatly enhanced economic returns. This in turn may provide cascading benefits for livelihoods, health and food security – contributing to the achievement of several SDGs (SDG 14 – Life Below Water; SDG 1 – No Poverty; SDG 2 – Zero Hunger; SDG 3 – Good Health and Well-Being; SDG 8 – Decent Work and Economic Growth). The worldwide cost of implementing sufficient processes for sustainable fishery governance has been estimated to be US$200bn (Sumaila et al., 2012), presenting a clear case for redirecting existing investment into fisheries and finding new ways of financing sustainable fisheries management.

In addition to public investment in governance for sustainability, emerging areas for future value creation for private capital and impact investment include: remote monitoring and surveillance technologies to support identification and enforcement against IUU; bycatch reduction technologies such as acoustic and visual pingers; on-vessel and post-catch technologies to reduce food waste, and increasing integration of 'Big Data' technologies for vessel monitoring and tracking.

PROJECT SCALE

PERCEIVED RISK



RETURN POTENTIAL

DEVELOPMENT STAGE

Sustainable aquaculture

Example project: Indian Ocean Trepang fish farm expansion[8]

Aquaculture refers to the aquatic equivalent of land-based agriculture and involves the farming of both animals and plants in freshwater and seawater. Mariculture, a subset of aquaculture, refers to fish farming where a farm is located in seawater, typically in coastal inlets or fjords. While aquaculture includes freshwater farming (not strictly part of the blue economy), figures are typically aggregated in such a way to make distinguishing between directly ocean-related and non-ocean related production difficult. For this reason, while acknowledging the freshwater distinction, this section will consider aquaculture in its entirety.

The world's growing population, combined with an emerging middle class demanding healthier sources of protein, are driving an increased demand for seafood products. In order to fulfil this growing requirement for aquatic protein, it is likely that the majority of future demand will need to be cultivated from aquaculture. Thus, in contrast to reported production trends observed with wild-caught fisheries, the aquaculture sector has experienced rapid growth in the preceding decades, and for this reason (despite forms of aquaculture having existed throughout history) it is considered an emerging blue economy sector. Over the period between 1990 and 2009, the aquaculture sector's growth outpaced that of every other livestock sector – growing at a rate of 7.5% per annum (Little, Newton and Beveridge, 2016). 2013 marked the year from which the contribution of aquaculture to total human seafood consumption exceeded wild-caught fish for the first time. Most recent data estimate aquaculture now provides 53% of fish consumed by humans, with projected supply surpassing 60% by 2030 (World Bank, 2013).

In 2017, world aquaculture production provided 111.9 million tonnes of live product to global markets totalling US$249.6 billion (FAO, 2019). Aquaculture also provided for 2,200 tonnes of non-food products (pearls and ornamental shells) at a value of US$186 million.

The contribution from aquatic animals and plants is broken down below:

- 80.1 million tonnes of aquatic animals (US$237.5 billion);
- 31.8 million tonnes of aquatic plants (US$11.8 billion).

Conservative estimates project that by 2030, there will need to be an additional US$150 - US$300 billion capital investment in the sector to meet projected demand. A 2019 report, published by The Nature Conservancy & Encourage Capital titled 'Towards a Blue Revolution: Catalysing Private Investment in Sustainable Aquaculture Production Systems' serves as a key document in defining how investments into sustainable aquaculture may be made (O'Shea et al., 2019).

8 www.undercurrentnews.com/2016/12/29/aqua-spark-makes-final-2016-investments-in-us-madagascar

However, the expansion of aquaculture will need to be managed sustainably to ensure marine (and terrestrial) ecosystems are not negatively impacted – for example, increasing demand for wild fish-based feeds and fish oils as inputs for aquaculture (given projected growth of the sector) is likely to present further stress to already heavily exploited fishery reserves.

As the industry has evolved and grown, new and promising early-stage investment opportunities to enhance sustainable aquaculture practices have emerged. These have included enhanced sensing and monitoring technologies for waste pollutants; improved farm management; yield enhancement; disease control monitoring and inputs; alternative protein and feed sources (insect-based, plant-based (soy and algae)), and developments in aquaculture infrastructure technologies.

PROJECT SCALE

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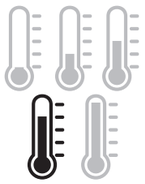
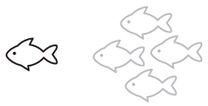


RETURN POTENTIAL

DEVELOPMENT STAGE



Marine bioprospecting

Example project: Early-stage investment in bioprospecting firm[9]

A fast-emerging market segment within the sustainable blue economy, marine bio-prospecting refers to the process of identifying unique characteristics of natural marine organisms – termed Marine Genetic Resources (MGR) – for commercial development. The diversity of habitats found in the ocean, ranging from coral reefs, to hydrothermal vents, to the deep seabed, has led to myriad genetic adaptations within their inhabitant organisms. These adaptations contain unique genetic code, meaning the diversity of marine organisms is particularly high (Arnaud-Haond, Arrieta and Duarte, 2011). These adaptations make these organisms uniquely attractive for commercial development, providing novel genes with commercial applications in bio-based industries ranging from food, to cosmetics, to agriculture, industrial and pharmaceutical products. Despite these advances, the full potential of their diversity has not been fully characterised and their commercial applications – as well as their potential to support new advances towards various SDG targets – not fully explored or realised (Hurst et al., 2016). Estimates in 2009 placed the value of global sales of marine biotechnology products at >US$1 billion (Leary et al., 2009). By 2025, the global market value for marine biotechnology has been projected at US$6.4 billion (Hurst et al., 2016).

Governance and equitable benefit allocation of marine biodiversity is a key issue in the MGR space, and remains in flux. At the time of writing, access and benefit-sharing of genetic resources (terrestrial and marine) within areas of national jurisdiction are regulated by the Convention on Biological Diversity (CBD) and the Nagoya Protocol, while resources beyond national jurisdiction will be regulated by the new UN biodiversity beyond national jurisdictions (BBNJ) agreement currently under negotiation.

9 www.marinebiotech.eu/sites/marinebiotech.eu/files/public/activities/Stakeholder%20meeting/Meredith_lloydEvans.pdf

Marine and coastal development

Marine and coastal development includes sectors based on the construction of new, fixed, physical assets at sea and along the coast. Creation of new physical infrastructure features heavily in this category, and the distinction between marine and terrestrial sectors is somewhat subjective. Here, we feature sectors physically located on/in the ocean (such as marine renewables and shipping) or with a clear marine impact while based on land (coastal and marine ecotourism and waste management). Other sectors that feature in coastal regions but without a direct impact on the ocean, such as transport infrastructure, are not included here. As with commodities, some sectors in marine and coastal development (notably related to maritime transportation and waste management) have received investment for many years, and require redirection of capital to sustainability; newer sectors like ecotourism require new sources of capital.

PROJECT SCALE

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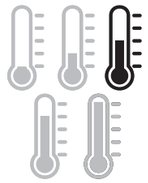

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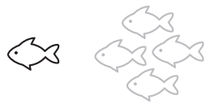
DEVELOPMENT STAGE



Nature-based infrastructure

Example project: Public investment in nature-based generation of new beaches, North Sea coast[10]

Nature-based infrastructure, an emerging sector of the blue economy, refers to the practice of developing infrastructure that seeks to mirror the natural characteristics of naturally occurring infrastructure forms - it is thus infrastructure that 'is created by human design, engineering, and construction to provide specific services such as coastal risk reduction' (Sutton-Grier, 2018). It is distinct from natural infrastructure highlighted earlier in the chapter. Through the use of natural and engineered features, nature-based infrastructure provides a more holistic approach to engineering infrastructure solutions – in such a way that preserves/delivers ecosystem services and social benefits.

While traditional built infrastructure in marine and coastal environments can provide services similar to those offered by nature-based infrastructure, its effectiveness deteriorates over time – contrary to nature-based infrastructure which, with increasing maturity, tends to bed down and improve. Nature-based infrastructure is also more adaptable and flexible to changing conditions.

Nature-based infrastructure is increasingly gaining attention for protection against coastal flooding. Whilst traditional infrastructure types are relatively common investments, and attractive due to their risk and return profile, nature-based infrastructure provides a less clear opportunity for return, though as the sector matures it is likely to offer upfront investment opportunities and long-term efficiency gains.

10 www.dezandmotor.nl/uploads/2015/09/280778-factsheet-zandmotor-engels.pdf

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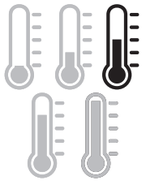


RETURN POTENTIAL

DEVELOPMENT STAGE

Coastal and marine ecotourism

Example project: Development of new ecohotel facility in coastal region

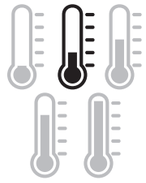
Ecotourism relates to forms of tourism activity which are designed to minimise environmental impacts and promote local communities' interests and economies whilst providing recreation and a learning experience. While tourism is a mature and established sector, ecotourism remains a smaller subset of the wider tourism market, and is considered here as an emerging sector of the blue economy. As an element of the ecotourism concept 'marine ecotourism' refers to activities which occur in marine and coastal environments.

A 2010 study estimated marine ecotourism generated in excess of US$50 billion per year, employing over 1 million individuals (Cisneros-Montemayor and Sumaila, 2010). Estimates place the annual value of coral reef tourism (through on-reef and reef-adjacent activities such as diving and snorkelling) at approximately US$36 billion per year (Spalding et al., 2017). At a regional level, ecotourism's value in Baja California has been estimated to generate over US$500 million per year (Spalding, Brumbaugh and Landis, 2016). Ecotourism is also a viable pathway to support conservation of marine biodiversity – a study by the Australian Institute of Marine Science concluded that a single reef shark presented annual value to the Palauan tourism industry of US$179,000 – or US$1.9 million over its lifetime. In contrast, a single reef shark, killed and sold, would only bring an estimated US$108 (Vianna et al., 2010). By 2030, it is estimated that maritime and coastal tourism will contribute 26% to the total ocean-based economy, while the wider tourism sector is projected to grow at a rate of 3.5% through to 2030.

Aside from the investment opportunities in developing new ecotourism facilities and infrastructure, it is important for policy-makers to consider how best to strike a balance between development and conservation on which ecotourism depends, and consider taking natural capital valuation into account as part of their economic development strategies to determine where ecotourism may be appropriate and viable.

PROJECT SCALE

PERCEIVED RISK



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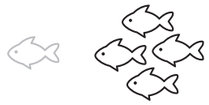
DEVELOPMENT STAGE



Maritime transportation

Example project: Fleet-wide vessel retrofitting for fuel efficiency and lower emissions[11]

Shipping, a long-established sector, is a linchpin of the global economy, with cargo vessels transporting roughly 90% of globally traded goods. Global seaborne trade as a sector is highly dependent on the overall health of the global economy; as a result, it is currently experiencing growth – expanding by 4% in 2017 as the global economy experienced more stable conditions. It is expected that 2018 growth will mirror that of its preceding year, with 3.8% compound growth to the year 2023 (UNCTAD, 2018).

However, shipping accounted for approximately 1 billion tonnes of GHG emissions over the period 2007 to 2012 (Smith et al., 2015). Most recent estimates suggest total shipping emissions contributed to 2.6% of global CO_2 emissions from fossil fuel use and industrial processes (Olmer et al., 2017), making it approximately equivalent to the total emissions of Germany. Furthermore, as might reasonably be expected given its projected growth as a sector, it is predicted that these emissions will grow rapidly in the coming decades if left unchecked. A recent study estimated that under current trajectories of expected economic growth, inaction could result in the shipping industry having a 17% share of global CO_2 emissions by 2050 (Cames et al., 2015).

In response to growing concerns, the International Maritime Organization (IMO) has recently announced a climate strategy with targets to reduce GHG industry emissions by at least 50% at a global level by 2050. There is real potential in leveraging the momentum created by this strategy to unlock new opportunities and innovations for decarbonising the industry. Deployment of new technology and innovation are going to be key for this sector to decarbonise operational emissions, considering that a 50% emission reduction requires a move to non-fossil energy sources for ships, starting in 2030 and accelerating to becoming the dominant energy source in 2040.

Alternative fuels and renewable energies will require scaling as adopted technologies should they be able to effectively contribute to required reductions. Biofuels, hydrogen and ammonia storage are all examples of new fuels and technologies considered to be viable contributors towards emission reductions. Electrification, batteries and motorisation as well as wind assistance through the reintroduction of sails to the merchant fleet are also considered to play a crucial role. Innovations in energy efficiency on the seas, as well as recent efforts to reduce vessel speed to save on emissions will also be key. Estimates based on research undertaken for the UK government suggests that by 2050 the market for maritime emission reduction technologies could reach US$15 billion per year. The IMO's adopted targets represent a unique opportunity to scope how business innovations, Fourth Industrial Revolution technologies (and the societal shifts they trigger), and the ramp-up of global supply chains for advanced low-carbon and ultimately zero-carbon fuels, can be harnessed to unlock new economic opportunities and address environmental issues by redesigning how maritime transportation systems are operating today[12].

Maritime transportation, particularly in the context of decarbonisation, is already being considered within the context of 'green' finance, as well as blue, and opportunities for increased capital flow to maritime transport are being demonstrated in numerous new ways. Recent green bond issuances have looked towards the debt market to support financing of technological retrofit and development across many environmental issues – with a view to implementing new systems and processes that reduce the environmental impact of maritime transportation. Furthermore, new sulphur regulations due to enter into force in 2020 have opened up new investment in low-sulphur refining technologies and their products, attracting new private capital.

11 www.spliethoff.com/news/ing-and-eib-provide-eur-110m-for-spliethoff-s-green-shipping-investments

12 The World Economic Forum, and Friends of Ocean Action are playing a leading role in the convening and coordination of the 'Getting to Zero Coalition', alongside the Global Maritime Forum. The Getting to Zero Coalition seeks to curate an industry roadmap; engaging stakeholders from across incumbent and new fuel value chains to identify the technologies, investments and timelines for decarbonization of fuels and associated infrastructure. In practical terms, this project will align stakeholders around what is needed to get the first zero-emissions vessels on the water by 2030.

Ocean-based renewable energy

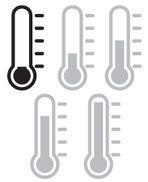
The ocean holds not only great potential in the fight against climate change through its capacity for carbon sequestration, but also in its capacity for the generation of low carbon renewable energy at a global scale. Thus, approaches to marine renewable energy generation are all emerging areas of growth in the blue economy. Due to technological advances allowing for expansion into the open ocean, the innovation of new technologies and growing policy support for renewables, the sector holds great promise for future development and provision of clean, reliable, low carbon energy.

Global energy and electricity consumption is forecast to rise in the future, alongside – and driven by - population growth. Combine these factors with corresponding increasing demands on already scarce land resources, and a need to provide for this increase in energy demand with energy from low-carbon sources due to global heating, and ocean-based renewable energy technologies present themselves as an attractive solution. Hoegh-Gulberg et al. project that by 2050, global electricity generation for offshore wind could reach 3,500 TWh/year. For other ocean-based sources, potential electricity generation may reach 1,900 TWh/year (Hoegh-Gulberg et al., 2019).

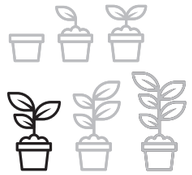
This opportunity has resulted in an increase in marine renewable energy installation in recent years, which has meant the sector has demonstrated strong growth. Much of this has been led by advances in offshore wind generation, whilst other marine renewable energies remain more experimental. Wave and tidal technologies have been developed and are operational, but they are yet to see commercial array-scale deployment. Ocean-based contributions to electricity generation amounted to less than 0.3% of global levels in 2019 (Hoegh-Gulberg et al., 2019). Fortunately, many renewable energy investment opportunities already fall within the scope of 'green investment' and comply with existing best practices for investment in a low-carbon economy, such as the wind criteria of the Climate Bonds Standard. Continued investment, and simultaneous innovation, is projected to lead to increased contributions from the marine renewable energy sector to the global energy mix by 2050 (IRENA, 2018).

PROJECT SCALE

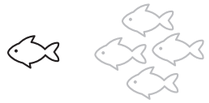
PERCEIVED RISK



RETURN POTENTIAL



DEVELOPMENT STAGE



Offshore wind

Example project: Gode offshore wind farm (see case study on next page)

Offshore wind is considered to be a highly scalable and critical low-carbon energy resource. As a result of being offshore and typically out of sight from land, installations are both open to lower levels of public opposition than their terrestrial counterparts and provide more consistent energy supply than onshore wind, without any land-use trade-offs (Bosch, Stafell and Hawkes, 2018). The market has seen large-scale cost reductions in recent years, contributing to the technology's increased uptake in global markets (IRENA, 2018). From most recently published data, at the end of 2018, total installed offshore wind capacity amounted to 23GW (IRENA, 2019). While distinctly the most established of the marine renewables, it is still an emerging sector of the blue economy due to its strong continued opportunities for growth.

On average, each country with suitability for offshore wind capacity could install offshore wind within 37% of its Exclusive Economic Zone (EEZ). Many countries also have the capacity to install offshore wind capacity that surpasses their country's annual electricity demand (Bosch, Stafell and Hawkes, 2018).

The OECD forecasts strong growth for the sector, in both employment opportunity and increases in global value added to the ocean economy: up to 8% in 2030, from <1% in 2010 – representing a compound annual growth rate in GVA terms of 24.51% (OECD, 2016). The International Renewable Energy Agency's projections show offshore wind to contribute to 4% of global energy production capacity by the year 2050 (IRENA, 2018).

Nevertheless, the sector is not a panacea. Environmental fears such as changes to productivity of benthic and pelagic habitats, noise and increased collision risk by seabirds are associated with the development of offshore wind farms. Pollution linked to installation and use of maintenance vessels is also a concern.

Case study

Ørsted (Gode Wind 1) project bond

In 2015, financing the construction and operation of offshore wind farm projects saw the adoption of new approaches when Ørsted issued the world's first project bond for the Gode 1 wind farm in Germany's part of the North Sea. Consisting of 55 turbines, Gode 1 is located just over 30km off the island of Nordeney, and is a part of the wider 900MW Gode wind cluster. Now operational, it is expected to provide the electricity needs for 340,000 homes.

The use of a project bond in the financing of the project represented, at least in part, a change in risk perception from investors in offshore wind energy projects, with a steady mainstreaming of renewable energy investments in the European energy market.

Key facts:

- **Capital type:** Debt, equity
- **Bond size:** €556 million
- **Tenor:** 10 years
- **Coupon:** 3 to 4%
- **Blue economy sectors targeted:** Offshore wind
- **Geography:** German Exclusive Economic Zone in the North Sea

Who was involved?
Ørsted; Global Infrastructure Partners; consortium of insurers; private finance; private equity

What did it do?
Ørsted decided to purchase and invest in Gode 1, a planned wind farm initially developed by a separate company, in 2013. Upon completion of purchase of the project, it sought to restructure its investments through highly technical restructuring and joint venturing, part of which entailed the use of a project bond as an alternative to existing equity and debt-based financing. The total project costs for the Gode 1 farm were approximately €1.5 billion.

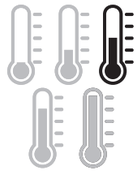
As a first step to help capitalise the farm, Ørsted agreed to develop a 50/50 joint venture for the wind farm between itself and financial investors, giving the project a higher credit rating and allowing it to attract more mainstream German institutional investors. Ørsted developed the joint venture with Global Infrastructure Partners (GIP), a leading global and independent private equity infrastructure investment fund. The GIP share purchase amounted to €780 million, part-capitalising the total project costs. As part of the transaction, GIP agreed to the issuance of a rated project bond totalling €556 million to part-fund the wider development of the project through capital markets. Numerous actors and third parties were involved in the creation of the joint venture and the equity structures that resulted between GIP and Ørsted, with the process taking only 6 months to move to issuing a bond. A consortium of twenty German institutional investors then purchased the bond, led by Talanx, the anchor investor (and also involved in the joint venture), who contributed €320 million. The bond was issued as a non-listed instrument with its first disbursement in October 2015, with a ten-year investment tenor and a coupon between 3 and 4%.

Crucial to the success of the restructuring were the technical and contractual protections provided against project risk and the partnership between Ørsted and GIP. This permitted the bond to be rated as investment-grade, making it eligible for investment by institutional investors. The bond represented the first time that institutional investors financed an offshore wind power project through a project bond. As part of the agreement, Ørsted continued towards the finalisation of the asset's construction; whilst also remaining the responsible party involved in the operation and maintenance of the facility.

Subsequent to the Gode Wind bond, Ørsted mirrored its approach at the Borkum Riffgrund 2 offshore windfarm. GIP again acted as partner, issuing a project bond invested in by an expanded consortium of investors which included many of the Gode 1 lenders. The precedent set through this partnership between institutions for the capitalisation of offshore wind is a prime example of ways in which innovative and creative applications of finance can be used to develop a sustainable blue economy.

PROJECT SCALE

PERCEIVED RISK



RETURN POTENTIAL

DEVELOPMENT STAGE

Tidal

Example project: Crowd investment in development of new tidal energy technology[13]

Caused by gravitational interaction between the earth, moon and sun, tidal ranges provide a source of renewable energy – particularly in certain areas of the globe where tidal ranges (the difference between ebb and flood tide) are significant and where geological features such as bays and estuaries confine and constrict these movements. Tidal range technology harnesses the energy created in the process between these two extremes of tidal height, to deliver a renewable, predictable source of clean, low-carbon energy.

Tidal renewable energy technologies on a global scale are not widely deployed, but estimates of the energy potential of tidal show them to be a promising source of future renewable energy. IRENA data for ocean energy, encompassing wave, tidal as well as ocean thermal energy conversion and salinity gradient energy, showed total installed capacity of 532.1 MW in 2018. Annual investment for the same year was reported to be US$200 million, a figure that has remained steady for the last ten years. (IRENA, 2019). Two tidal energy facilities contribute to over 90% of this installed capacity: Sihwa Lake in South Korea and La Rance in France.

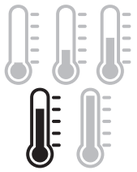
A 2018 theoretical estimation of global annual tidal range energy found an approximate resource of 25,880 TWh. However, much of this resource is currently located in regions where extensive sea ice limits current feasibility of tidal infrastructure. When discounted, the estimated annual resource was estimated to be 5,792 TWh per year (Neill et al., 2018).

Despite this promise, perceived lack of real-world applications and accompanying empirical experience breeds uncertainty within this market. High costs associated with tidal equipment and its installation as well as grid connection from often difficult locations make tidal energy expensive per kWh. As a result, tidal energy remains dependent on public support in many geographies. For investors, therefore, more established renewable energy technologies display lower levels of financial risk. To remedy this, additional policy support is required to allow tidal technologies to develop commercially.

13 www.seedrs.com/nova-innovation/sections/key-information

PROJECT SCALE

PERCEIVED RISK



RETURN POTENTIAL

DEVELOPMENT STAGE

Wave energy

Example project: Commercialisation of existing technology for wave power[14]

Like tidal energy, wave energy represents a potentially huge untapped renewable energy resource. Wave energy technology seeks to harness and convert the energy contained within the ocean's waves, generated by the vertical movement of surface water, into electricity. Wave energy technologies use a variety of different methods and technologies (termed Wave Energy Converters (WEC), to generate electricity.

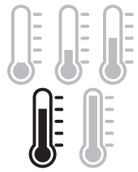
Wave energy projects are yet to reach the same stage of maturity as tidal energy, with many technologies still in pre-commercial demonstration phases and yet to show economic viability (Aderinto and Li, 2018; Penalba and Ringwood, 2019). Early estimates place theoretical ocean wave energy resources at approximately 32,000 TWh per year (Mørk et al., 2010; Penalba and Ringwood, 2019). The most optimistic estimate of global technical potential, however, has been estimated to be 5,550 TWh/year (Krewitt et al. 2009).

As with tidal energy, the lack of empirical operational and financial data from wave projects inhibits current investment. However, new projects are increasingly coming online – such as new installations developed with WaveRoller technologies in geographies including Portugal.

14 https://marineenergy.biz/2019/07/08/new-investors-for-eco-wave-power/

PROJECT SCALE

PERCEIVED RISK



RETURN POTENTIAL

DEVELOPMENT STAGE

Floating solar

Example project: Very early-stage concept development for floating solar farm[15]

Floating solar refers to the deployment of solar photovoltaic panels, using the same technologies as those installed in terrestrial environments, on constructions that float on water bodies. As with offshore wind, when compared to its terrestrial counterpart, floating solar does not suffer from conflicts associated with land-use trade-offs. Like wind, it is based on existing technology that is rapidly becoming cheaper; unlike wind, it is also not reliant on shallow water for anchorage to the same extent as a wind turbine, making it an attractive prospect particularly for deep-water countries in the tropics, including many of the Caribbean SIDS and Southeast Asian archipelagos.

Global installations of floating solar have increased over the last five years, reaching 1.1 GWp (Gigawatt-peak). This represents the same capacity that ground-based solar reached at the turn of the millennium (World Bank Group, ESMAP and SERIS, 2018). Much of floating solar deployment is currently restricted to inland water-bodies (where the World Bank estimates floating solar has the potential to produce 400 GWs of electricity) but there have been several announcements of projects seeking to deploy solar capacity in the ocean in recent years (Deign, 2019).

15 https://uniiq.nl/en/portfolio-item/oceans-of-energy-en/

PROJECT SCALE

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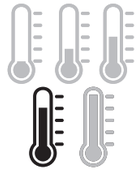


RETURN POTENTIAL

Waste management

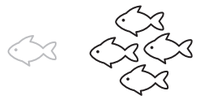
Example project: Development of recycling innovation fund for new waste management solutions[16]

Waste management is an established sector, but its importance in the context of the blue economy is a more recent development, notably as a result of sustained campaigning around the impacts of plastic waste on the marine environment and the importance of tackling this problem at its root on land. Marine debris and pollution cause damage, both ecologically and economically, to the ocean. Most debris and pollution found in the ocean begins its life on land – with 80% of marine pollution worldwide coming from terrestrial sources, including plastic as well as nitrogen and phosphorous-rich agricultural run-off. Plastic, specifically, has been the subject of increased attention in recent years and has become a high-profile issue. Its annual production has increased 200-fold since the 1950s (Li, 2016).

Alongside plastics, in estuarine and coastal areas, agricultural pollutant and sewage run-off are some of the primary causes of increasing observations of hypoxic (low oxygen) zones, driven by a 10-fold increase in agricultural fertiliser usage since 1950 and a tripling of the human population (Breitburg et al., 2018).

In many geographies, particularly countries in Asia, insufficient or non-existent waste and wastewater management infrastructure is leading to untreated, or under-treated, waste leaking into the ocean – often via rivers. The true costs of poor waste management for the marine environment encompass environmental and human health issues, but also reduced economic benefit owing to resource inefficiencies and economic costs of clean-up (Newman et al., 2015). Estimates have placed the economic cost of marine plastic pollution at a staggering US$2.5 trillion (Beaumont et al., 2019).

DEVELOPMENT STAGE



A transition toward a more circular economy is widely reported to provide for positive economic outcomes owing to enhanced material efficiency, growth stimulation and innovation. Investments in better waste and wastewater management systems can provide impetus towards this transition, allowing investors the opportunity to capture waste streams before they enter the environment and unlock potential revenue streams from capturing value at material end-of-life.

16 https://recyclinginternational.com/business/will-israels-8-6-million-investment-in-recycling-tech-make-a-difference/27331/

Pre-requisites and co-requisites for sustainable financing

Successful financing for the development of a sustainable blue economy requires several pre- and co-requisites. These provide clarity on how to define and determine sustainability, enable responsible investment to take place as well as ensure a higher likelihood of project success. Much has been written on pre-requisites and co-requisites for successful financing – indeed, many of the sources and references for this chapter link to comprehensive and insightful overviews of successful financing from a variety of fields. However, there is a gap in highlighting how these apply in the context of the blue economy, which faces several unique conditions and challenges. To help address this, the following chapter aims to be as comprehensive as possible in considering these pre- and co-requisites in the context of the blue economy, and are divided into the broad categories of governance, investment climate, and knowledge and innovation.

Governance structures

Policy frameworks and planning

A foundational step to a good governance regime for any investment lies in the public sector ensuring the presence of a strong and effective policy framework supporting both sustainability and investment. This may include, for example, policies designed to minimise market failures through environmental externalities by explicitly valuing ecosystem services as part of the national infrastructure; to foster innovation by entrepreneurs and companies, and to create an investment-friendly climate (see below) for capital providers in sustainability projects. Key to sustainability policy frameworks is the provision of the legislative basis for subsequent interventions and programmes that foster investment. For example, in the case of Belize, the legislative framework adopted for fisheries reform in 2011 (FAO, 2018) enabled a cascade of interventions and innovations that have set Belize's marine environment on a pathway to sustainability.

A closely related and equally vital element is the establishment and deployment of a well-defined long-term development plan for a sustainable blue economy. Such a plan should articulate which sectors are priorities in the national interest (taking into account the value of natural capital and a more holistic perspective on the national economy, as recommended in WWF's New Deal for Nature (World Economic Forum, 2019) and identify how the public sector will support development and investment, with clearly quantified targets. These plans are crucial, not only in setting out the macroeconomic priorities for blue economy development at the national scale (for example in the Seychelles' blue economy roadmap (Government of Seychelles, 2018, see box overleaf), but also in providing a strong and clear signal to investors that the government is prepared to invest in elements of the sustainable blue economy with opportunities for growth.

While national policy is clearly important in this regard, policy levers can be pulled at multiple scales, and valuable tools exist here at both the sub-national as well as the super-national scales. In the former, local and provincial/state-wide policies, regulations and statutes serve a similar role as at the national level, with the added benefit that they can be more targeted and tailored to a specific sector or community. Collectively, many states have adopted common positions for the development of a blue economy (notably the European Union (European Commission, 2019) which sets the tone for policy development towards a sustainable blue economy for the 27 Member States). At the global level, policy can provide rails for future development conversations and a foundation for coordination among states to further sustainable development. In this regard, UN efforts such as Agenda 2030 and the Sustainable Development Goals offer clear examples of such policy in practice.

The Seychelles blue economy strategic policy framework and roadmap

In 2018, the government of the Seychelles approved the Seychelles blue economy strategic policy framework and roadmap ('the roadmap'). This sets out an approach to developing the Seychelles' ocean-based economy in the context of existing global commitments, details the sectors of the national economy that rely on the ocean and highlights the Seychelles 'Blue Economy Brand' – the perceived comparative advantage enjoyed by the Seychelles on sustainability, through notable schemes such as its debt-for-nature swap and the world's first sovereign blue bond.

The roadmap is based on core principles of sustainability (such as resilience, partnership and good governance) and focuses on delivering, by 2030, four key pillars:

- **Creating sustainable wealth**, through economic diversification of established sectors and stimulating new and emerging sectors (notably mariculture, renewables and biotechnology) through policy setting and pilots;
- **Sharing prosperity**, by reducing dependence on food imports, ensuring access to education and improving the business environment and ease of doing business;
- **Securing a healthy and productive ocean**, by building ecosystem service accounting (see Glossary) into existing economic measures (notably GDP), developing resilience through climate mitigation and adaptation strategies and protecting coastal assets through MPA designation;
- **Strengthening the enabling environment**, focusing on the cross-cutting actions needed to deliver the other pillars such as research and development, leveraging appetite for investment in sustainability and strengthening partnerships.

To support the roadmap, the government of the Seychelles has implemented a Blue Economy Department in the office of the Vice President that ensures cross-sectoral oversight and integrated decision-making on developing the blue economy, alongside a monitoring and evaluation framework which uses existing SDG indicators to measure progress.

(Source: Seychelles' Blue Economy Strategic Policy Framework and Roadmap: Charting the future (2018-2030)).

Political willingness

For many sectors within the blue economy, particularly those with limited track records for sustainable investment (e.g. in fisheries or ecosystem services), investors will rely on substantial public sector interventions such as credit guarantees, first-loss capital and the creation of a robust policy and legal framework to de-risk the prospects of investment. However, action by the public sector comes at an opportunity cost, and many leaders and politicians will not prioritise the blue economy over other sectors or development needs. As such, political willingness to act for a sustainable blue economy is a vital, if challenging, pre- and co-requisite for investment that will vary from country to country – those with a strong maritime history and/or facing immediate existential challenges from an unsustainable ocean (notably the small island developing states) are likely to feature a more engaged political leadership. An excellent example of the impact of political willingness in driving change is through the policy reforms for the blue economy in the Seychelles. Here, the presence of politicians with a clear interest in promoting the development of a national blue economy sector substantially impacted the legislative and political agenda, enabling the subsequent debt swap and blue bond issuance that have financed the country's sustainable blue economy agenda.

Sustained public pressure, lobbying, campaigning and demonstrated interest from the private sector are all potential levers to build and sustain political willingness towards action for a sustainable blue economy. However, it is important to recognise this is nearly always a temporary state and, once attained, political willingness should not be squandered.

Monitoring and standards

While a robust policy framework is an essential foundation, its impact is limited without a means to monitor and measure progress, and standards against which such progress are defined. Such standards create trust in a system and a sense of legitimacy that builds investor confidence. As for the policy framework, creating monitoring systems is often in the purview of the public sector, though with substantial input from NGOs and academia. Standards very often stem from either the NGO sector or the private sector, with the best standards having a strong basis in science and clear requirements for good data collection and use. Monitoring is a vital mechanism to account for the real-world impact of investments and provide a sense of the conservation and environmental impact of a project. Both voluntary and mandatory monitoring frameworks exist, and here again enabling policies to ensure robust monitoring underpin success.

Standards also provide a benchmark for what sustainability means in a given sector – not always well defined – and in so-doing provide a goal against which to measure progress in a given project or investment. Among the most famous standardisation frameworks is the International Standards Organisation which has developed many industrial performance standards. Many environmental standards, however, have been taken up by third party organisations, notably in the forms of sustainability certification such as the Forestry Stewardship Council and Marine Stewardship Council eco-labels, which signal sustainability to businesses and consumers. Within the context of the blue economy, the principles for investment in wild-caught sustainable fisheries, the Poseidon Principles for shipping, the criteria of the Global Sustainable Tourism Council and the Sustainability Standards for Infrastructure Investors are some of the key resources to guide investment in blue economy sectors.

Public incentives and disincentives

Public sector incentives and disincentives, when applied thoughtfully and carefully, are vital policy instruments for blue economy sectors. Designed effectively, they can work in tandem with private investment for greater results. Among these tools are taxes, subsidies, permits, fines and fees to encourage desired investments and behaviours in the blue economy. For example, fines are particularly helpful tools in disincentivising illegal behaviour, discouraging free-riding and ensuring a healthy, competitive marketplace. Similarly, ensuring that taxes are set at a reasonable level to promote investment, and that subsidies align with the underlying policy framework, and do not create unintended behavioural outcomes, are both key to successful public-private collaboration for investment in a sustainable blue economy.

Specific tax instruments that can be applied in order to foster a more sustainable outlook include product and resource taxes, energy, transportation and emission taxes, and more specialised environmental taxes for noise pollution, packaging and waste (EY, 2016). Notable examples with relevance to the blue economy include the emergence of levies on single-use plastic bags in an effort to reduce marine plastic waste, as well as the use of licenses or permits to regulate fishing. Many of these taxes feature associated incentives, reliefs and exemptions to incentivise more sustainable behaviours.

Subsidies are particularly important to consider in the context of the blue economy, as they are powerful tools that have the potential to create unintended outcomes, particularly when they are applied simplistically – fuel subsidies directed towards fishing fleets, for example, have directly contributed to both over-fishing and illegal fishing behaviour (FAO, 2017). Well-designed subsidies, however, can rapidly incentivise desirable behaviour by companies and individuals and can play a powerful role in public-private partnerships – for example, reducing the prevalence of harmful subsidies that contribute to over-exploitation whilst offering incentives to participate in certification schemes for least developed rural communities to gain market access for their products (UNEP, 2009).

Investment climate

Law and legal recourse

Closely related to the existence of policy frameworks and other governance structures, legal recourse is a central pillar of investor confidence and enabling investment. Unlike the overall investment climate and the availability of insurance, the availability, and quality, of legal recourse rests with the public sector and the strength of a given country's judiciary. This is a vital prerequisite for investment – a country without a robust judicial system, and lacking avenues for legal redress of grievances, is highly unlikely to receive foreign direct investment (FDI) at an appreciable scale. This is compounded in new sectors and projects with higher risk and uncertainty where a legal framework may not have been fully established, for example, around payments for ecosystem services, blue carbon or bioprospecting.

Insurance

Another element of investor confidence in blue economy projects lies in the availability of insurance mechanisms to shield capital providers from potential losses. At its most basic, insurance is a service offered, typically by the private sector (although the public sector does provide insurance, notably against flooding, the efficacy of this is questioned in light of greater risk due to climate change (Botzen & Van den Bergh, 2006)) to offset the impact of economic losses from specific events (such as catastrophic fire, market collapse or other pre-identified events). This is financed by the payment of monthly or annual premiums to the insurance provider by the entity being covered. Because of the protection they offer, investments are substantially more likely to take place in regions of the world with established insurance markets, and innovators in financing for a blue economy have greater latitude to experiment with financing in the knowledge that insurance mechanisms exist to protect from losses. Insurance can be a powerful tool to catalyse sustainable investment practices, for example in deciding to stop providing insurance services to fishing vessels known to be operating illegally.

While valuable to build investor confidence, increasing the availability of insurance for coastal communities, local entrepreneurs and companies is in itself a mechanism to improve the creditworthiness of blue economy investment projects. Increasingly, insurance providers working in partnership with local communities, businesses and NGOs are identifying new means to extend insurance to the blue economy (for example through the Mesoamerican Reef insurance project (Iyer et al, 2018)). Insurance providers who are able to unlock new means of addressing the 'coverage gap' in insurance (as is the case in the parametric insurance example on the Mesoamerican Reef (Iyer et al, 2018)), particularly in coastal communities in emerging markets, may be well-positioned to take advantage of any resulting growth in the blue economy.

A different form of insurance known as guarantees, typically deployed by development finance institutions (DFIs), provides what is known as 'first-loss capital' to reduce investment risk in a project. This will be discussed in greater detail in the chapter on capital types and sources.

Case study

Quintana Roo Conservation trust fund with parametric insurance

What is it?
The Quintana Roo Trust for Coastal Zone Management, Social Development and Security (Quintana Roo Coastal Zone Management Trust) was established in 2018 by the Quintana Roo state government, The Nature Conservancy (TNC), the National Parks Commission and hotel owners operating in Quintana Roo, Mexico. The Trust was established to manage beaches and coral reef maintenance and repair along a 160km stretch of coastline along the Mesoamerican reef located in Mexico's Quintana Roo state. The Trust, which will operate as a conservation trust fund (CTF – see investment models chapter), purchased a first-of-its-kind year-long parametric insurance product for the coral reef in 2019.

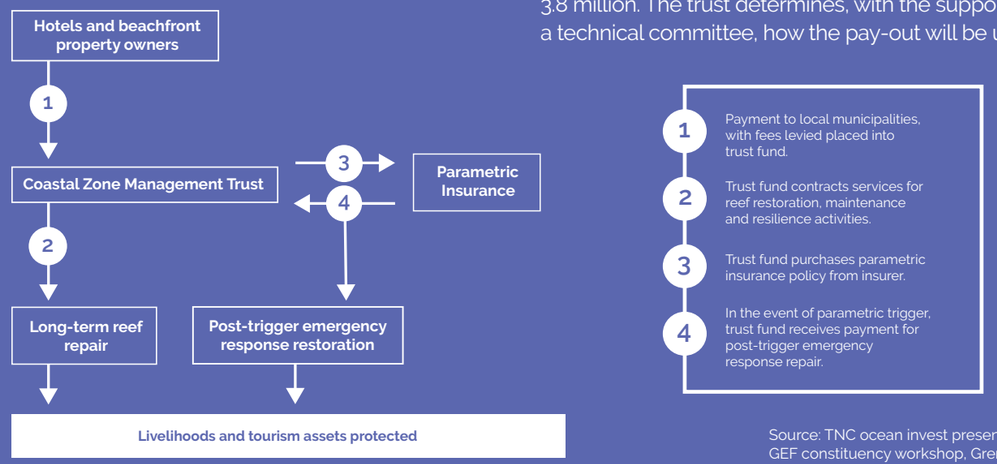
Key facts

- **Investor type:** Eventually, blended public, private and philanthropic
- **Capital type:** Disbursed grants
- **Founding year:** 2018
- **Typical investment:** US$100-150,000 for immediate response to storm damage
- **Typical investment duration:** 2-5 years to recover storm damage
- **Geography:** A 160km section of the Mesoamerican reef fringing Quintana Roo, Mexico
- **Blue economy sectors targeted:** natural infrastructure; payments for ecosystem services/reef conservation

Who is involved?
The Nature Conservancy (NGO), state government, National Parks Commission, local hotels, Swiss Re

What does it do?
The Trust, which is legally established but not yet fully operational, will be funded by fees paid by beachfront property owners (hotels) for commercial use of the beach. It will finance the repair and maintenance of local coral reefs, which provide ecosystem services to the local area - notably through protecting the tourism value of the reef and providing flood defences during hurricanes. These same fees are also used to fund the parametric insurance policy, which triggers immediate pay-out in the event of high wind speeds associated with hurricanes. The pay-out unlocks rapid response in the six municipalities covered by the trust within the first 60 days, post-recovery, to repair damaged reefs, dramatically increasing their chances of recovery.

How does it work?
The trust is set up to enable it to collect funding from a variety of sources, including private sector fees as well as philanthropy, and will disburse funding towards the management of the local area's coral reefs. The parametric insurance, developed by TNC in collaboration with Swiss Re, a swiss insurance firm, is defined by three elements: the parameter (wind speed), the polygon (the spatial area where the wind speed must occur) and the pay-out. The pay-out triggers automatically if a wind speed >100 knots occurs anywhere within the polygon, with a maximum pay-out over the 12-month period of US$ 3.8 million. The trust determines, with the support of a technical committee, how the pay-out will be used.



Source: TNC ocean invest presentation, GEF constituency workshop, Grenada

Liquidity

Like the availability of an insurance market, the existence of an overall healthy investment climate is essential for financing. Specifically, investors look for the key notion of liquidity. A market with plenty of liquidity is typified by the availability of multiple similar products (e.g. companies or deals of a similar scale and risk-return profile) and a healthy pool of potential buyers of these products. This demonstrates an investment climate where assets can be bought and sold easily. Depending on what kind of investor you are and what market you work in (notably in the bond and public equity markets, see next chapter) liquidity is a key factor in how risky an investment is perceived to be. If an asset (for example, shares in a fish processing company) cannot be sold on (because it is too different, experimental or otherwise uncommon), risk-averse investors are less likely to want to acquire it. While liquidity is a valuable co-requisite for investment, it is not vital, as it can be offset by investment models and strategies specifically designed to tolerate high risk. For example, the high-risk, high-reward approach of venture capitalists and the aforementioned use of first-loss capital offset liquidity concerns to an extent, and allow for investment in new and unproven markets or assets. Many such markets and assets feature in the blue economy.

Larger investors, notably pension funds, sovereign wealth funds and large-scale asset managers such as BlackRock, can change the level of liquidity in the market through their individual actions. A decision, for example, by a fund like BlackRock (which recently announced a new circular economy fund, with clear links to a sustainable blue economy) to enter a new space is typically followed by other investors who follow the lead of established players. To date this hasn't happened at a significant scale in the blue economy, but entry by the likes of Norges Bank Investment Management, which recently produced guidance on how it intends to invest with respect to the sustainable blue economy, are a powerful signal towards building confidence and liquidity in the blue economy.

Collateral and cash flows

A key challenge in many development finance investments is the lack of readily identifiable collateral (the assets which can be used as a guarantee for investors in the event of default) or a lack of clear cash flow in a given project, particularly in developing countries where available assets are limited. For projects without clearly monetisable assets (notably those with a strong conservation focus such as protected areas, where there are often no ownership rights or cash flows), identifying potential cash flows (even if these are secondary to the main objective of the project, for example building a sustainable tourism business alongside a protected area) and building more flexible approaches to collateral (such as individual guarantees and community pooling of assets) are vital to financing a sustainable blue economy. It is worth highlighting that uncollateralised lending, which takes a higher risk in not relying on collateral to secure a loan, nevertheless plays an important role in investment in the sustainable blue economy; this is discussed in greater detail in the next chapter.

While developing projects that support cash flow are typically in the gift of the private sector, governments have a role to play in building an environment that creates cash-flow certainty and generates income from ecosystem services.

Knowledge and innovation

Financial literacy and business planning

For the blue economy as a sector to receive investment capital, the businesses, entrepreneurs and individuals working within the sector must know and understand how to run a business and how to forecast growth. Furthermore, they must be able to communicate effectively with investors, who use very specific language and demand very specific information from their (potential) investees. This is doubly important where investment is intended to flow towards new projects or concepts that aren't in the mainstream and therefore not familiar to most investors (for example in fisheries recovery or protected area financing). Ultimately, finance is as much an art as it is a science, and investors need to feel comfortable with the projects and individuals pitching their concepts before deciding to invest. Without the ability to communicate with investors and demonstrate *why* a project is worthy of investment (which is as much about having a robust business plan, and individual experience in receiving investments and project management, as it is about the merits of the business idea itself), a project is unlikely to receive financing. Thus, the development of financial literacy, business management experience and business planning capacity are vital prerequisites for project developers/entrepreneurs/communities. Globally, business accelerators and incubators (see glossary) can help build this capacity and bring projects and individuals up to a point of 'investment readiness'.

While this document attempts to provide a high-level overview of some of the financial literacy required in support of investment in the blue economy, many investment funds (such as Katapult Ocean, below), and institutions (such as the OECD) have developed programmes (typically offered as 'technical assistance') to promote and raise financial literacy in the context of financial inclusion, and teach the fundamentals of business planning. A notable example is the OECD's International Network on Financial Education (INFE).

Case study

Katapult Ocean: accelerator and seed investor

What is it?
Katapult Ocean is a combined early-stage impact investor and accelerator for blue economy projects based in Oslo, Norway with a global focus. Recently closing their first investment fund at US$ 4 million, Katapult Ocean targeted investment in 24 blue economy start ups, with plans to scale out to an additional 40 startups through a new fund. In addition to undertaking relatively high-risk early-stage seed investments through their fund, Katapult Ocean supports the wider development of vital (and often missing) project pipeline through providing their investment projects with an accelerator programme.

Key facts:

- **Investor type:** Broad range of impact funds, family offices, pension funds and foundations and ocean industry strategics
- **Capital type:** Early-stage equity investment
- **Fund size:** Current fund closed at US$4 million, raising for larger fund
- **Founding year:** 2018
- **Typical investment:** US$150,000 – 300,000, of which US$50,000 through in-kind support
- **Typical investment duration:** Fund lifetime is 7 years
- **Geography:** Global
- **Blue economy sectors targeted:** Technology-based projects in renewables, shipping, fisheries, aquaculture, exploration, ocean health including waste and circular economy

Who is involved?
Broad range of investors, partners and pilot customers and research institutions, with WWF Norway as a founding partner.

What does it do?
Companies with a solution for the blue economy that is both commercially viable and addresses one of the ocean's many challenges apply to be part of Katapult's accelerator programme, and enter an assessment phase during which time Katapult interviews and undertakes due diligence around potential participants (solutions to date have ranged from companies helping to identify illegal fishing vessels through artificial intelligence, to electric propulsion systems for work and leisure vessels). Then, if their application is successful, Katapult Ocean typically invests US$150,000 per individual project, of which US$50,000 is disbursed through in-kind support as part of the accelerator programme. Katapult Ocean then provides a hands-on accelerator, lasting three months, which provides mentorship, support on the business model and strategy, fundraising, impact measurement and communication, in addition to a testing environment for their projects to grow and develop. On completion of the accelerator, projects are better equipped to scale and have access to a new network of contacts and potential investors.

How does it work?
At the start of the programme, Katapult Ocean works with their accelerator companies to define milestones and core KPIs, which are then used to tailor a specific programme including access to mentors, programme sessions run by international experts, and network introductions to investors. Companies can have more than one mentor, but 'lead mentors' are paired with each company based on their needs and milestones, to provide insights and guidance on business development, growth and strategy.

On completion of the programme, Katapult Ocean continues to offer fundraising support and introductions to potential investors to programme graduates.

Ultimately, Katapult Ocean aims to create a 'global ecosystem' network of ocean industry innovators, from startups to corporates, alongside NGOs and academia, to break down barriers between actors in the ocean space and accelerate sustainable change.

Investment example:
Several participants in the first accelerator round can be found on Katapult Ocean's website, though an example of note is Recyglo, an initiative to introduce waste management systems and an online marketplace for waste in Myanmar to prevent it from reaching the ocean.

Sustainability literacy

Much in the way that project developers, NGOs and entrepreneurs require a clearer understanding of the language used by investors to secure finance, investors need to more clearly understand what 'impact' means and the core aspects of sustainability that they need to be mindful of to capture the new paradigm of green and blue investment. This includes building a basic understanding of the sectors of the blue economy (see previous chapter on this topic) as well as the key frameworks to guide what is meant by sustainability through resources such as the previously mentioned Sustainable Blue Economy Finance Principles. Many investors, notably in the impact investing space, have developed the basis of a sound understanding of the sustainable blue economy. However, much complexity remains which, if understood better, would help to reduce the perceived risks of investing in sectors of the blue economy and better align capital with impact.

Data management

Both investors and the projects that they invest in must be able to provide information on their performance, status and some means of forecasting for the future. These abilities rely on good data management – ranging from data collection to analysis and proper and secure storage. Without effective data management, it becomes nearly impossible to predict how much return on investment a project is likely to generate, and therefore what sort of investor to try to attract, or how to structure an investment proposition. It also impedes the ability for an investment project to be assessed once it is underway, to determine whether performance is meeting expectations and if not, to correct course. Within the blue economy, many sectors that have historically received support from NGOs and philanthropy do have some data available – but typically not data that's useful to an investor, such as projected growth rates, key fixed and variable costs, or required capital. Building a system to collect data, and to interpret data in order to provide the information investors need, is therefore a key pre-requisite for investment in the sustainable blue economy.

While this is essential from a business planning, investment, and monitoring and accountability perspective, good data management is also increasingly vital from a privacy perspective with emerging regulations covering how different actors can use data.

Further reading
A useful guide on data management for sustainability information for investment can be found here: www.unglobalcompact.org/take-action/action/value-driver-model.

Collaboration and corporate innovation

For new investment opportunities, particularly those in emerging sectors of the blue economy where risks are high and cash flows are minimal, there are clear and complementary roles for the public and private sectors to play. For investment and development to be a success, these sectors must be able to work together and recognise each other's strengths and limitations. As such, effective collaboration to support innovation and development is an important requisite for investment in the blue economy. Key actors in such collaboration often include government ministries and agencies (including local government), knowledge holders such as universities, NGOs and research centres, private entities including businesses, incubators and accelerators, often with some interface with investors, notably impact investors and venture capitalists with an interest in seed investment.

Corporate innovation plays a role in allowing the development of blue economy investments to mature through the stages of development, particularly in using corporate resources to scale potential solutions from an individual project to broader applications. By way of example, some supermarket chains that source fish from around the world, notably Walmart, have played a proactive role in projects that seek to improve the sustainability of these fisheries, as this has a direct impact on the reliability of product flow and reduces supply chain risk. While the corporate sector has a powerful role to play, it is important to remain mindful of greenwashing, and ensure that corporate activities are developed in such a way that their impact is lasting and meaningful.

A good example of collaborative efforts at work in the blue economy has been through the efforts of 'blue clusters' (Hansen et al, 2018), a type of formalised partnership that emerged in the developed world to promote development and investment opportunities in coastal cities and regions, notably around technological innovation. Blue clusters are varied in their approach, focusing on either research, policy or start-up incubation, and are tailored to their local contexts. While an effective means to catalyse new development in the blue economy, thus far blue clusters have relied on existing robust institutions and linkages between the public and private sectors, i.e. they build on existing relationships, formal or otherwise. To achieve scale, models will be required that can build partnerships from the ground up, to be applied in a broader array of geographies and socio-economic contexts.

Capital types and sources

When considering the financing of sustainable blue economy projects, a key step is understanding who is providing the capital and what is expected in return. This chapter provides a foundational overview of the main sources of capital providers involved in financing a sustainable blue economy, the types of capital available and their relevant characteristics. Where possible, links to resources that offer additional, more in-depth information are provided. Further detail on individual investment models (such as a blue bond), how they are used and who provides them, is covered in greater detail in the chapter on investment models.

Capital types

Investment exists along a spectrum, dependent on requirements to return a financial profit, how much of a financial profit, and at what levels of risk. At one end of the spectrum lies pure philanthropy (wherein there exists no expectation of financial profit but, rather, expectation is focused on a proven social or environmental benefit). At the other end of the spectrum, highly risk-averse commercial finance is driven purely by the potential for financial return, or profit.

Where return on investment is required, there is a second spectrum to consider: the extent to which expected returns are fixed or variable. Fixed-return capital broadly falls under the category of debt, the most common example of which is a simple loan, but also includes bond instruments. Debt-based financing offers a fixed package of money (because it is based on the investment paying a fixed interest rate every year), usually with a very low appetite for risk, for a fixed duration and at a fixed interest rate.

At the other end of the 'return' spectrum lies equity, differentiated from debt by taking an ownership stake in its investments. Because of this ownership stake, equity investments can offer the potential for much higher returns than debt, which in turn enables equity investors to take higher risks. This share of an investment also means equity investors receive an annual share of the performance – dividends – that reflect how well the investment is doing. The return on investment can therefore vary year on year, unlike debt. In principle, equity investments are indefinite until the shareholding is sold.

The following outline of capital types considers both of the above spectrums to provide an overview of the landscape. It is important to note, however, that finance is an inherently flexible discipline – for every rule, there are exceptions. As a result, the below information is illustrative, rather than a set of hard and fast rules. The section focuses on capital types and sources currently relevant to the sustainable blue economy; many additional capital types and sources are not covered. Different types of capital can also be combined to achieve different results – this is referred to as blended finance (explained in further detail on page 56).

Impact-only money

Impact-only money is typically long-term, but small-scale in comparison to the larger types of commercial finance (such as bonds and public equity). It is unburdened from needing to generate a financial return, but as such is less appealing for capital holders to provide. As a result, this is the domain of the public sector and philanthropy, and typically (though not always) provides grants for projects and systems that are unable to generate an attractive return on investment, but serve a public good (such as ecosystem monitoring, public education, or coastal defence). Despite its comparatively smaller size, in the context of the blue economy it is estimated that impact-only money is much more prominent and significant than commercial capital, an imbalance that this Handbook hopes to help address.

Public financing

In the context of this Handbook, public financing is the capital provided by a national or sub-national (especially municipal) governmental body for goods, services and infrastructure that serve the public interest. Public financing is deployed towards a vast number of things and is by far the largest category of non-return-seeking capital. In the context of sustainability, and where governments have prioritised spending on sustainability (see previous chapter on political will), public financing is often allocated towards vital efforts that do not easily generate revenue – such as establishing, monitoring and enforcing Marine Protected Areas (MPAs). As public financing is mandated to cover a wide variety of areas, its availability is limited and, as a result, public financing often works collaboratively with private finance to achieve greater scale. For example, in the case of financing MPAs, public capital can be used to create and enforce legislation for protection, and private capital can take on the role of stimulating the development of a sustainable tourism sector around the MPA, creating jobs and boosting tax revenue for the public purse (Blue Finance, 2015).

While governments provide non-return-seeking public financing, they will often seek to raise additional capital in the marketplace (see below section on bonds).

Official development assistance

Much as governments will provide public financing domestically, some countries, particularly OECD members, will allocate some public funding towards official development assistance (ODA). This can be disbursed from one country directly to another, typically through a national agency (this is known as bilateral assistance) or this can be disbursed through a multilateral institution, including agencies of the United Nations, where funding from many nations is pooled. For example, in the blue economy space, the United Nations Food and Agriculture Organization (FAO) prioritises work related to fisheries and aquaculture, while the International Maritime Organization (IMO) focuses largely on shipping.

ODA funding, typically disbursed as grants, is often directed towards particularly challenging projects focused on public goods (such as education or public infrastructure) in developing countries in which commercial finance would not consider investing. As a result, it is a vital instrument in finance for sustainable development, and often a key factor in blended finance – notably in the case of providing first-loss capital (see page 56: A note on blended finance), which insulates commercial investors from risk, opening up a broader array of projects to potential investors.

Philanthropic grants

Philanthropy, like public financing, is non-return seeking. Unlike public financing, philanthropy is provided by non-governmental actors, including foundations and charities, NGOs, high-net-worth individuals (HNWIs) and corporations typically deploying corporate social responsibility (CSR) resources. Philanthropy is often directed towards a specific sector or area of focus, usually aligned with the interests and priorities of those providing it. Like ODA, it tends to be small-scale at the project level and plays a crucial role in financing sustainable development by focusing on projects and regions other capital providers don't, but unlike ODA it tends not to blend well with other types of capital because of the rules governing how philanthropy is used. In many instances, philanthropic money cannot be paired with commercial money. Philanthropy is an enormous contributor to the resources that fund the ocean, estimated at a combined total of US$8.3 billion in the last 10 years (Funding the Ocean, 2019).

Debt

Broadly speaking, debt instruments (such as loans and bonds) are low-risk, low-reward types of capital that offer a high degree of freedom to both the borrower and investor. Beyond the initial borrowing agreement (the terms of which can nevertheless be highly detailed and subject-specific), debt providers don't have the same level of influence over an investment as equity investors. While this offers a certain kind of flexibility, it means that debt providers are typically more risk-averse and slower to invest in sustainability than nimbler and thematically-driven equity investors. However, opportunities for scale are substantial once a sector has demonstrated returns – exemplified by the expansion of the climate and green bond markets. Increasingly, standards for green and sustainable investment are emerging for global debt markets.

Loans

Loans are among the most common financial instruments, variable in scale from personal and micro-finance (up to US$50,000) to large-scale corporate loans in the hundreds of millions. Loans are predicated on a fixed relationship between a lender and borrower wherein the lender agrees to disburse a fixed amount of capital to the borrower, with the expectation that this capital is repaid within a specific timeframe, with interest payable by the borrower. As such, lending carries a cost to the borrower (typically ranging from 4-20% of the value of the loan in investment charges) dependent on the scale of the loan, the length of the repayment period and the level of risk the lender is willing to take on.

Broadly, loans subdivide into secured and unsecured loans. In a secured loan, the borrower pledges some form of asset as collateral – mortgages are a good example of a secured loan, where the borrower pledges the purchased property as collateral to the lender in the event repayments can no longer be met (referred to as defaulting on the loan). Unsecured loans are generally smaller than secured loan; typified by credit card debt, personal loans and bank overdrafts.

Lending is one of the dominant forms of financing, because of its flexibility in scale and its ability to blend well with multiple capital providers to create attractive risk-return ratios (see box on blended capital, below). When not blended, lending is typically restricted to established sectors where returns on investment (and hence the ability of the borrower to pay interest) are clear and collateral is easily identified, for example issuing a personal loan to a fisher to purchase a new boat or new fishing gear.

Where returns are less clear (and lenders perceive a higher risk), secured loans are preferred, but this proves a challenge in many forms of conservation and sustainability financing as there is often nothing to point to as a monetisable asset, meaning there is nothing to borrow against. For example, in the case of carbon sequestration in mangrove forests, these forests provide enormous value by drawing carbon out of the atmosphere, however without some form of cash flow to attach to this service, a mangrove forest is essentially a worthless asset to a lender, more so if the land on which the forest sits is public and there is no clear ownership of the asset, which is often the case (Huwyler et al, 2016). As a result, much conservation finance work focuses on establishing assets for the purpose of lending and securitisation (the conversion of a collateralised asset to a marketable product that can be sold to other investors, which also serves to raise liquidity in the market).

Loans can be provided at market rates, where risk, demand and supply of capital determine the interest rate, or in certain circumstances they can be provided at discounted rates, where they are known as *concessional loans*. Concessional loans are a favoured mechanism of multilateral development banks (MDBs) for investment in the public sector in lower-income countries, with relatively high levels of indebtedness, to capitalise public projects. Because of their greater risk tolerance, concessional loans are often a key component, alongside guarantee facilities, of blended finance.

Bonds

The bond market constitutes the majority of the global financial marketplace, and uses some specific language to describe its activities:

- the borrower, the one 'creating' the bond, is the **issuer**;
- the one who buys the bond is the **holder**;
- the interest rate on the term of the bond is the **coupon**, which is to be paid at regular intervals by a repayment deadline, when the initial value of the bond is also paid back;
- this initial value of the bond is termed the **principal**;
- when the initial value of the bond is repaid, this is the **maturity** of the bond;
- the time from issuing the bond to maturity is referred to as the **term**.

Where a loan flows outward from a lender to be taken up by a borrower, a bond is issued by a borrower and 'purchased' by a holder. The proceeds from the sale of the bond are then used by the borrower to finance an investment, with the returns on investment typically being used to repay the borrower. As a debt instrument, bonds, like loans, are fixed in duration and interest rate. Bonds are an intermediary product, meaning the bond is a product that can be bought and sold in its own right, akin to a debt 'currency', and are highly liquid in the market due to their standard structure and scale. Depending on the credit rating of the issuer, bonds are freely bought and sold by investors, which makes them an attractive product. By definition, a bond is a secured instrument, backed up by the creditworthiness of the borrower.

Bonds can be issued by both the private sector (particularly by large corporations through *corporate or project bonds*) as well as the public sector (through *sovereign/ government bonds* and, for cities, *municipal bonds*). Corporate bonds are used by individual companies to finance new investments, for example Vattenfall's recent (and first) green bond for financing renewable energy infrastructure (Vattenfall, 2019). Sovereign bonds, however, are typically issued to finance ongoing operations or support government spending. Because the public sector can generate revenue through taxes and can fund projects that don't need to generate revenue directly, government bonds can be well suited to conservation projects. Beyond the issuer and use of proceeds, structurally public and private bonds are quite similar. In recent times, both corporate and sovereign green bonds (which feature an explicit environmental sustainability mandate), climate bonds (which feature an explicit decarbonisation mandate) and, more recently, blue bonds, have emerged as debt instruments for conservation and a sustainable blue economy. Of these, blue bonds are especially noteworthy as a subset of a green bond where use of proceeds must be tied explicitly to the blue economy. Like green bonds, they require use of proceeds to be specific and measurable as well as a clear process for reporting on impact.

To date, all blue bonds have been issued by countries (notably the Seychelles) or international financial institutions, but it is important to remember that the *colour* of a bond doesn't designate its structure, only its objective (in this case, ocean sustainability). It is possible that in future, corporate and project bonds, as well as alternative structures such as impact bonds are given a 'blue' designation.

A number of standards to regulate the environmental and sustainability credentials of bonds in the context of the green economy already exist, notably the Climate Bonds Standard and the Green Bonds Principles which offer guidance on process and sector-specific issuances (such as bonds for renewable energy projects). While these are not specific to the blue economy, some overlap exists in 'green' and 'blue' projects. For example, developing low-carbon infrastructure along the coast or in offshore renewable energy generation.

Equity

Equity is based on taking an ownership stake in an investment, and is much more variable than debt in both scope and tolerance for risk. Some types of equity, notably venture capital, are high-risk, high-reward with an expectation of failure in at least some of its investments. Other equity-based investments, for example buying shares in a company with a very high credit rating (see glossary), are in a similar risk-reward spectrum as the most conservative types of debt capital. The scale is equally variable, ranging from microfinance to multimillion dollar investments and corporate acquisitions. While a very broad range of providers exist, here we cover those that are most relevant to financing a sustainable blue economy.

As mentioned above, equity works on the concept that assets can be broken up into shares, which can be sold by the owner to raise capital. These assets, e.g. funds, trusts, companies or corporations, take on additional owners (the shareholders) as more of these shares are sold, which impacts on how decisions about the asset are made. The companies use the proceeds from the sale of their shares to invest in the asset, help it grow and thus raise the value of the shares, which investors can then sell off at a future date at a higher value. In addition, shares pay out a periodic dividend to shareholders out of a company's annual profits. Equity, and how shares are bought and sold, broadly subdivides into publicly traded and privately traded equity.

Public equity[17]

Public equity is open to be traded by anyone through public exchanges (stock markets). To qualify for public equity, a company needs to be listed on a public exchange, and transition from a private firm to a public entity through an Initial Public Offering (IPO). At this point, shares in the company are released to the general public and the value of these shares is determined by demand. Demand, in turn, is determined by the performance of the now-public company, which reports on its performance quarterly. Once an investor (be it an individual, an investment fund or another corporation) owns a certain percentage of the shares of a company, they gain substantial influence over how that company performs and is to be run, and day-to-day ownership of the company itself can change hands (sometimes involuntarily) based on the number of shares owned.

Public equity is highly liquid, as there will almost always be a buyer if you want to get rid of your shares. It is also more open to scrutiny, as public companies are obliged to release information on their financial performance. Many environmental standards and principles are geared towards public equity investments (notably efforts such as the Principles for Responsible Investment and the Task-force on Climate Related Disclosures (TCFD)) as these build on existing reporting requirements. Public equity is also where shareholder activism and activist investors, who purchase shares for the explicit purpose of aiming to make performance changes related to sustainability, work best. In the sustainable blue economy, certain sectors are much more likely to be publicly traded, notably the larger, more established sectors such as tourism, energy, shipping and the industrial end of the fishing sector. Other sectors, notably those focused on ecosystem services or conservation, are typically smaller and, where the private sector is involved, companies tend to be privately held and not publicly traded.

17 N.B.: When investors refer to an investment as being 'public' they are almost always referring to public equity, and not to an investment in or by the public sector

Equity investment[18]

All companies start out private, and when they raise capital through equity the providers of this capital are termed equity investors. Where *public* equity investment is expected to make a return through accumulation of stock, equity return is based more on dividends and other distributions of capital back to investors. Equity investments into a company are made in progressive 'venture rounds' based on progressing maturity, starting with a 'seed' round of very early-stage capital, followed by a progressive series of funding rounds, each with greater expectation of the value of the company. Equity is perceived as more risky than public equity, in part because it is not subject to the same regulations and guidelines that exist for its public counterpart. It is also much less liquid than public equity as shares, once acquired, are not as easily sold.

Equity investors are typically investment funds, rather than individuals, comprised of limited partners (LPs – also known as silent partners) who own the majority of the fund but don't make any decisions, and General Partners (GPs) who own a minority of the fund but are responsible for making deals and operating the fund (as well as carrying the liability for the fund's fortunes). These funds will have a specific profile and objectives, expectations of return, appetite for risk and geographic focus. Based on this profile they will raise money from investors (banks, individuals, development finance institutions or other funds, who become the LPs) which is pooled to invest in companies and projects by the GPs. Equity investment includes a sizeable majority of the investments taking place for a sustainable blue economy, including categories of investors such as impact investors and venture capitalists.

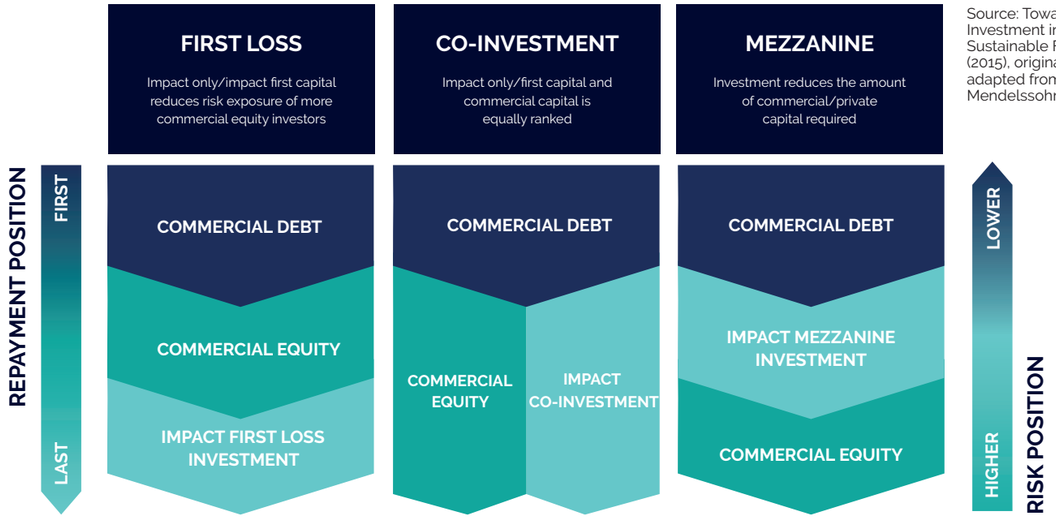
18 Here we mean equity as an asset class in companies that are not publicly traded on a stock exchange. 'Private equity' carries a separate meaning of taking a poorly performing company back into private ownership to restructure and sell at a profit (historically known as a leveraged buy-out).

A note on blended finance

Mentioned regularly throughout this document is the concept of blended finance, in essence the process of combining different types of capital, from different providers, to create scale and reduce risk. The OECD defines blended finance as the strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries. Additional finance is commercial finance that does not have an explicit development purpose and that has not primarily targeted development outcomes in developing countries, and development finance is public and private finance that is being deployed with a development mandate. This framing of blended finance distinguishes finance by purpose rather than by source, moving away from the emphasis on public/private actors to highlight development/commercial finance flows (OECD, 2018).

It is essentially a means of unlocking greater amounts of capital for projects that require it, but are deemed too risky for any one capital provider who would be able to provide the money on their own. Public-private partnerships are a common mechanism for blending capital, where a public entity (such as a development bank or government agency) works with a private entity (such as a private equity fund or corporation) leveraging each other's strengths to work together in pursuing a common goal. Blending capital can happen vertically (using multiple types of capital for a single project, at a fixed point in time) or horizontally (spread through time) depending on the needs of a project. For example, where an investment requires a lot of upfront capital with limited potential for returns to be sustainable (as is the case for many fishery investments), spreading capital horizontally, with philanthropic, public or concessional capital used upfront, can attract more commercial capital towards the tail end of the project, where revenue-generating activities that are dependent on a sustainable foundation can take place (EDF & Duke Nicholas Institute, 2018).

Key components of a capital stack can include guarantee facilities, impact mezzanine investment, commercial equity and commercial debt. The first three are more junior to more risk-averse commercial debt in a blended capital 'stack'. In effect, seniority is a means to determine who gets paid out, and in what order, from an investment, with the senior-most getting paid out first and the most junior capital paid out last. In the event of bankruptcy, risk (and the financial hit) are absorbed in the opposite direction. Here, a guarantee or first-loss facility is an invaluable tool in blended finance as it can be structured to absorb the cost of the loss of a certain percentage of the investment principal, protecting the rest of the capital stack from the risk of losing their investments. Similarly, mezzanine capital can reduce the cost of capital by bridging the risk/return gap between equity and debt and opening up an investment to more capital providers.



Source: Towards Investment in Sustainable Fisheries (2015), originally adapted from Mendelssohn, 2013

For further reading on blended capital, the World Economic Forum has developed a helpful framework to describe different approaches to blended capital, including various forms of financing and establishing appropriate supporting mechanisms (World Economic Forum, 2015).

Capital sources

Having established in broad terms the types of capital available for the sustainable blue economy, this section focuses on their sources. Wherever possible, information on the scale of investment in the blue economy has been included; however, due to the lack of disaggregation of portfolio information by blue economy sectors, combined with a lack of disclosure requirements for many private entities, there are substantial data gaps regarding investment flows, and substantial additional work is needed to unpack the investment landscape.

Some capital providers are able to deploy many different types of capital depending on intended use, and the circumstances at hand. Other entities specialise in delivering only one type of capital, such as philanthropic foundations. This section seeks to further illustrate this inherent flexibility that comes with finance, and provides contextual information on the capital providers themselves.

Governments

Domestic government

Domestic governments (ministries and government agencies, but also sub-national entities including cities, states and provinces) will exclusively use public capital to finance domestic projects. However, they are amenable to being blended with other types of capital in public-private partnerships if this unlocks a greater scale of investment in areas considered government priorities.

ODA agencies

Bilateral aid agencies will generally use non-revenue generating public capital to fund development projects around the world. Like domestic government spending, they are amenable to this capital being used in combination with other types of money to unlock greater investment. Some aid agencies have developed revenue-generating arms to their activities, with the stated aims of having limited development capital go further, and to foster financial independence and financial literacy in their investments. These are typically based on debt financing and concessional lending as well as providing risk guarantees, a mechanism notably deployed in the blue economy by USAID, which provided a US$50 million credit guarantee to Althelia Ecosphere's Sustainable Ocean Fund. ODA agencies have been exploring more innovative approaches to their grant-making, particularly in supporting the development of investment opportunities in the blue economy – a notable example here is the funding provided by the Government of Luxembourg to the Blue Natural Capital Financing Facility, which seeks to develop sound, investable blue natural capital projects through preparing and structuring blue natural capital opportunities into bankable investments.

Sovereign wealth funds

Sovereign wealth funds are, in essence, the governmental equivalent of a private investment fund, using a portion of a national government's capital to make money on the international markets. Not all countries have sovereign wealth funds, and the most notable of these funds belong to resource-rich countries that have collected substantial revenue from e.g. oil and gas extraction – Norway, the United Arab Emirates, Saudi Arabia, Brunei and China hold the world's largest sovereign wealth funds. Sovereign wealth funds operate at a vast scale, generally not engaging with products worth less than hundreds of millions of dollars. They engage with the bond market but will also trade in public and equity investment. Recently, the Norwegian sovereign wealth fund has offered specific guidance on ocean and blue economy-related investments (NBIM, 2018), but sovereign wealth funds have been particularly sluggish in engaging with sustainable development financing due to their high risk aversion.

Philanthropy and non-governmental organisations

Philanthropy

Philanthropy, notably through philanthropic foundations, provide a substantial amount of the funding for charitable and non-governmental activity in the sustainable blue economy (estimated at US$8.3 billion in the last 10 years (Funding the Ocean, 2019)). Foundations are among the primary sources of funding for many of the world's NGOs, which can receive grants worth millions of dollars per year from their largest donors. Other forms of philanthropy include donations from individuals, a form of non-return-seeking crowd funding. Some philanthropic foundations may include a return-seeking investment arm that is distinct from their philanthropic activity. These investment arms may seek to maximise their returns (to support the longevity of the foundation) and won't invest directly in sustainable products, and won't work in tandem with non-return seeking philanthropic capital. There are strict rules governing the use of philanthropic money and in many cases philanthropic grants are not allowed to be blended with other types of capital, making their use in sustainable financing limited. Nevertheless, they form a core component of the funding for much of the world's charitable activities of a sustainable ocean.

NGOs

NGOs can be thought of as a private equity fund for non-return seeking capital, in that they raise funds (from philanthropy, ODA and multilateral agencies) from multiple (non-return-seeking) investors and then disburse this funding into projects that they curate and manage. Their returns are measured along social and environmental, rather than financial lines and are reported back to their 'investors' (in this case, donors). NGOs play an essential role in focusing on conservation and sustainable development projects to which governments cannot, or will not, commit resources, filling a substantial gap in the landscape. Increasingly, NGOs are recognising the value of sustainable finance in furthering their social and environmental goals, and while they are not allowed to use their donor money to invest directly (they are governed by the same rules as philanthropy in this respect), they are increasingly working to create the enabling conditions for investment using philanthropic resources and, in some cases, are establishing new and independent investment funds from these activities to further the progress of sustainable finance. A noteworthy example here is Rare, a US-based NGO which, with support from the Global Environment Facility (GEF), the Dutch development bank (FMO) and others, established the impact-oriented Meloy Fund, raising US$22 million in investment capital towards small-scale fisheries projects in Indonesia and the Philippines. The fund remains a wholly-owned subsidiary of Rare, and works closely with Rare to identify project pipeline, though investment decisions and investor relations are managed in-house by the Meloy team.

Case study

Conservation International Ventures (CI Ventures)

CI Ventures is an investment fund, which invests in small- to mid-sized enterprises and is designed to benefit both ecosystems and human-wellbeing. Its investments span activities that fall within forests, oceans and grasslands, such as sustainable agriculture, aquaculture and ecotourism, in locations where Conservation International works.

Key facts:

- **Investor type:** Private Debt, Venture Capital
- **Investment stage:** Seed, Early-Growth, Growth
- **Capital type:** Debt, Quasi-Equity
- **Fund size:** US$30 million
- **Founding year:** 2018
- **Typical investment:** US$200,000-500,000
- **Typical investment duration:** Up to 5 years
- **Geographies:** Global, Peru, Colombia, Kenya, South Africa, Indonesia
- **Blue economy sectors targeted:** Sustainable Aquaculture, Fisheries, Ocean Technology

Who is involved?
- Conservation International
- Philanthropic and private donors (undisclosed)

What does it do?
CI Ventures seeks to act as a bridge to the 'financing gap' in conservation finance, by providing capital and accompanying resources – including technical assistance - to its investments in small- to mid-sized enterprises. These investments are designed to enable future larger additional investment, from a diversity of sources, by enhancing "investment readiness". CI Ventures was formed to provide financing solutions in both established and emerging markets with high conservation value that are currently underserved by mainstream capital.

How does it work?
Typically, HNWIs and foundations will donate grant money to projects without an expectation of return, and in many cases are rigid about how this money can be used. CI Ventures takes a different approach, using philanthropic dollars to capitalize a revolving investment fund targeting high-impact portfolio opportunities. Portfolio income and realized gains are returned to the fund and reinvested in new opportunities. CI Ventures thus works to put philanthropic grants to repeated use. This model has proven attractive to Conservation International's existing donor base, who see an appeal in their money potentially being invested in multiple projects when capital growth from investments is reinvested.

As an 'impact-first' vehicle, CI Ventures prioritizes investment opportunities that are expected to generate significant environmental and social benefits relative to fundamental and other key risk factors. Investments are made in small- to mid-size businesses, deemed to be situated in economically attractive markets, and demonstrate viable business models and the potential to unlock future capital investment from other sources. Strong management and a fundamental alignment with Conservation International's mission and values are also considered. CI Ventures has developed and uses proprietary tools for impact screening, monitoring and evaluation.

In addition to loaning capital, businesses are provided technical assistance and access to Conservation International's network to enhance their opportunities for growth and impact.

The fund aims to have invested in 100 deals in 10 years, seeding a further US$200 million from investment partners. To this end, it has already been successful in attracting co-financing, leveraging an additional US$7.9 million from an initial US$1.3 million in investments.

Investment example:
JALA is a woman-led tech start-up that helps Indonesian shrimp farmers increase yields and enhance environmental and economic performance through improved water quality management. The US $150,000 CI Ventures investment in JALA was structured as a revenue-based financing mechanism, providing the company with a source of non-dilutive capital adapted to the needs of an early stage company.

International financial institutions

International financial institutions (IFIs) are financial bodies founded by multiple nations for the purpose of supporting development. They include multilateral development banks (MDBs), regional development banks, bilateral development banks, and more, and lend to countries, rather than companies. They focus on a wide range of projects and sectors, with an increasing interest in conservation and sustainability. They typically have several arms that allow them to disburse capital in different ways. Some of them have grant-making facilities, similar in structure to how multilateral agencies (see below) disburse non-return seeking capital. Almost all of them feature some form of concessional loan facilities, wherein they will extend capital at below-market rates to certain (typically low-income) borrowing countries.

Closely related to the MDBs and often bundled together with them are the Development Finance Institutions (DFIs), multilateral agencies that invest at commercial rates into the private sector in middle-income countries at lower rates than commercial banks due to their different capital structures. These structures allow DFIs to invest more easily in difficult places where purely commercial finance would struggle, and for this reason play a crucial role in enabling investment. Their capital is often used as part of a blended capital stack to de-risk an investment opportunity alongside other types of money. Operationally, they may work under the same broad umbrella as an MDB counterpart – for example, the International Bank for Reconstruction and Development and the International Development Association (both MDBs, targeting middle-income and low-income countries, respectively) and the International Finance Corporation (a DFI) work under the umbrella term of the 'World Bank' (including other facilities such as MIGA, a type of guarantee facility). Donor countries are generally excluded from receiving MDB and under DFI loans. Generally, MDBs and DFIs finance through debt, rather than equity mechanisms.

In recent years, MDBs have announced new commitments to the development of a sustainable blue economy, including the Asian Development Bank's US$5 billion Healthy Oceans Action Plan[19], the European Investment Bank's US$2.5 billion Blue Sustainable Ocean Strategy[20] and the World Bank's US$28.6 million recent sustainable development bond for the blue economy[21], managed by Credit Suisse. Many of these new MDB resources are focused in large part on building new waste management capacity to address marine plastic waste, though all signal greater focus and interest in investment in the sustainable blue economy.

19 www.adb.org/news/adb-launches-5-billion-healthy-oceans-action-plan

20 www.eib.org/en/press/all/2019-283-the-eib-commits-eur-25-billion-for-the-sustainable-blue-economy#

21 www.worldbank.org/en/news/press-release/2019/11/21/world-bank-and-credit-suisse-partner-to-focus-attention-on-sustainable-use-of-oceans-and-coastal-areas-the-blue-economy

Other multilateral agencies

Other multilateral agencies, including the programmes and organisations of the UN, disburse grants and development assistance to countries in need of technical assistance, but will also provide resources that foster development and sustainability globally. As such, these agencies primarily provide non-return-seeking capital. This is not without exception: the Global Environment Facility (GEF) provides investment capital through its non-grant investment model, for example, through early investment in the impact-oriented Meloy Fund. Combined, the value of bi- and multi-lateral aid for the ocean has constituted US$5.4 billion since 2009 (Funding the Ocean, 2019).

Several of these agencies, including the Finance Initiative of the United Nations Environment Programme (UNEP FI) and the United Nations Global Compact, have an explicit focus on facilitating greater corporate and investor financing for a sustainable economy. In 2019, UNEP FI absorbed ownership of the Sustainable Blue Economy Finance Principles, and is developing a sustainable blue economy finance initiative to increase the use of these principles by financial institutions, acquiring new signatories and developing methodologies to make the principles more sector-specific.

Private finance

Equity investors

Equity investors, as the name suggests, primarily invest through equity – however, many investment funds will use lending in addition to buying shares to achieve a desirable risk-return ratio. As a result, many investment funds that, for the sake of simplicity, are grouped here under private equity investors, will in practice use a combination of equity and debt.

Impact investors

Impact investors have become increasingly common in the sustainable blue economy space, with many notable entrants in recent years including Althelia Ecosphere and Encourage Capital. Impact investors seek a financial return on investment in addition to social or environmental returns, but will typically tolerate longer investment horizons than mainstream investors. They can invest through both equity and lending, and will often use both in an individual project to achieve a desirable risk-adjusted return. As such, individual funds are, to an extent, mission-driven, and will typically orient themselves to a specific sector, such as fisheries or protected areas. Impact investments in the blue economy space, thus far, have been relatively small, with no funds having raised more than US$100 million (and the actual amount invested likely smaller still). The reason for this lack of investment is not due to a lack of interest from the investor community; indeed more and more ocean-focused impact funds are emerging with the blue economy as a core focus, and established funds are expressing an interest in investing in blue economy-linked projects. Rather, key challenges facing impact investors relate to a lack of available projects with a sufficiently attractive investment proposition, either because they are too risky or, more frequently, because they are too small even for impact funds, which are typically willing to invest from US$500,000 per project.

Nevertheless, the tolerance for lower returns and the ability for impact capital to blend well with other types of money for greater effect (notably in pairing with MDB lending) makes impact investors particularly key at this early stage of sustainable blue economy financing, and if pre-requisites for investment can be more comprehensively addressed – notably in the field of financial literacy and business planning – substantial opportunities exist for impact finance to flow to the blue economy.

Case study

Circulate Capital Ocean Fund

Circulate Capital, launched in 2018, aims to invest in capacity building of waste management and recycling facilities in South and Southeast Asia – areas representing some of the world's most significant sources of marine plastic waste. The fund's investments intend to minimise marine plastic pollution leakage through local partnership, innovation, work within the policy sphere and across supply chains. The fund invests for impact across three principal segments: collection; sorting/processing; and recycling/end markets.

Key facts:

- **Investor type:** Venture Capital
- **Investment stage:** Early, Venture
- **Capital type:** Equity, quasi-equity, debt
- **Fund size:** US$106 million
- **Founding year:** 2018
- **Typical investment:** >US$2 million
- **Typical investment duration:** Up to 5 years
- **Geographies:** Principally India, Indonesia, the Philippines, Thailand & Vietnam
- **Blue economy sectors targeted:** Waste management

Who is involved?
USAID, The Ocean Conservancy, PepsiCo, Procter & Gamble, Dow, Danone, Unilever, The Coca-Cola Company and Chevron Phillips Chemical.

What does it do?
The fund offers early-stage (post-seed) capital for waste management projects, to support them in building investment track records for second round funding and prove business models in their growth phase. Given its geographic spread across the South and Southeast Asian region, it looks to invest in a variety of waste management business models depending on local contexts. Through its investments, the fund and its investors offer technical expertise and support to grow new business models and waste management solutions. To date, over 200 projects have been evaluated for investment and the first deals are scheduled to get underway in early 2020.

How does it work?
Circulate Capital's structure is relatively unique in that their investors are leading brands with experience in working with plastic – in addition to each of them committing capital to the fund, they also contribute technical and procurement expertise to help the portfolio scale and drive maximum impact. This allows the fund to leverage the technical expertise of its backers as well as structure its lending to maximise impact, with investors seeking only a modest (single-digit) return over a long timeframe. An agreement with USAID to provide an investment guarantee was announced in June 2019, allowing the fund to structure blended deals, significantly reducing investment risk. The fund's investment decisions are supported by a committee of technical experts including leading academics and NGOs on waste management to ensure environmental, social and governance (ESG) considerations for investment are met. Ultimately, the fund seeks to unlock co-investment with other private investors and family funds to accelerate the pace of development of waste management solutions in the region.

Venture capitalists

Unlike impact investors, venture capitalists are not willing to take a reduced financial return in exchange for higher social and environmental ones. Instead, the favoured strategy of venture capital (sometimes initialised to VC) is to invest in a wide variety of projects or products (though typically still in the same sector, for example technology) with the expectation that many of these projects will fail, but the ones that succeed will perform exceptionally well with high growth rates and opportunities for sizeable returns, offsetting the failures of the others. This high-risk, high-reward strategy is challenging to apply to conservation projects due to its very high return expectations, though it shows promise in the context of the blue economy in nurturing new start-ups and in ocean technology investments, for example in robotic monitoring of ecosystems or innovative renewable energy projects, where venture capital is ideally suited to capitalise many projects simultaneously, in the hope of finding a breakout star with the potential to transform the industry.

Dedicated ocean-related venture capitalists are more difficult to find, and there is some overlap here with the impact investor community, as interest in the blue economy by definition values 'impact'. However, some hybrid entities that have sought to marry impact-oriented VC with other tools to enable investment, such as project accelerators or 'blue clusters' have brought additional venture capital into this space. Notable examples of this approach in practice include the Icelandic ocean cluster's investments in student projects it has nurtured, and Katapult Ocean's accelerator programme, which includes an investment component and focuses largely on technological innovations in the blue economy (see case study).

Commercial banks

Commercial banks play a variety of important roles in the financial ecosystem, handling transactions, offering accounts and providing wealth management. Here, we particularly explore their role through the lending of money to private businesses across different sectors. This lending can be utilised for a variety of means, from project finance, to construction and operating finance, to re-financing (where existing debt that has been partially paid off is restructured on more favourable terms).

The true scale of commercial bank activity within the sustainable blue economy depends on the boundaries placed on what sectors are included in the definition. However, Dutch commercial banks have been noted as particularly focused on investing in elements of the sustainable blue economy, with ASN Bank, Triodos, Rabobank and ABN AMRO identified in an EU mapping exercise (European Commission, 2018). Others, such as Standard Chartered and Credit Suisse, have been pioneers in mapping out the potential investment opportunities in the blue economy space, or providing some of the aforementioned banking services in early examples of blue economy investment models, such as the Seychelles Blue Bond.

Pension funds

Pension funds are the financial product through which an individual's pension contributions are pooled for low-risk investment, to save for retirement. Pension funds consequently hold savings from a wide and diverse number of investors over a long-term time horizon, and are among the largest sources of capital in scale. Data indicated that in 2018, pension funds within OECD geographies held assets amounting to US$27.6 trillion. At a global scale, Willis Towers Watson put the figure at US$40.1 trillion.

Pension funds' scale and long-term view lends them towards investments that offer low-risk, inflation-adjusted returns in large projects (upwards of US$500 million). As a result, they have seen very little application in sectors of the blue economy, though pension funds are among the investors in project bonds and large-scale investment in coastal infrastructure such as ports and hotel property. The key to attracting pension fund capital to the wider sustainable blue economy will therefore be primarily in identifying sufficiently large projects and to demonstrate competitive risk and return levels when compared to more traditional equity and bond investments. The ability to do this would be likely to not only increase capital flow to the sustainable blue economy, but also support the embedding of sustainable blue economy principles into the plans of the companies that purchase pension plans from these funds.

Crowd funding

Crowd funding is a more recent innovation, whereby the internet's ability to bring together large numbers of people is harnessed to capitalise projects. In essence, crowd funding works much like traditional investment, either through an equity model where a great many people become shareholders, or a debt model where a great many people become lenders, in aggregate. The main difference with crowd funding is scale, as typical contributions from individuals are much smaller than from traditional investors, yet can achieve a workable scale through aggregation. Projects that capture the imagination are able to attract significant funding though, due to its reliance on popularity, the model is not a reliable source of investment. Nevertheless, its variability means that crowd funded projects are able to address the 'missing middle' in investment, the gap between microfinance (<US$50,000) and smaller impact investments (>US$500,000), which feature abundantly in the sustainable blue economy.

A note on insurance

Though not a capital provider in the same sense as others in this chapter, it is important to discuss the role that insurance plays in enabling investment in a sustainable blue economy, over and above what was outlined in the chapter on investment requisites. This manifests in two different ways. One is the application of insurance instruments to the development of a sustainable blue economy and ways to do this in non-traditional circumstances. The other is the challenge presented by climate change to the insurance sector itself and how this relates to the central role of the ocean.

Insurance is an essential risk mitigation tool against the risk of financial loss resulting from damage, malpractice or other changes to a business' operating environment. In many parts of the world, and in projects that feature a high perceived risk of investment, this insurance can play a vital role in reducing risk and unlocking loans and other forms of investment capital (GIZ, 2017). However, the insurance premium can be prohibitively expensive, leaving individuals and businesses exposed to risk, stifling development. Notable insurance companies working to build the capacity and knowledge in the insurance sector to develop products and services that extend insurance cover (also referred to as reducing the coverage gap) are AXA XL and Willis Towers Watson.

Separately, the insurance sector has recognised for some time that climate change is one of, if not the greatest, challenge to their industry (EY, 2008). Through a concerted effort to improve forecasting models, the insurance sector is now in a strong position to understand the risks and subsequent insurance opportunities resulting from climate change, and apply new mechanisms to addressing these risks whilst simultaneously expanding insurance coverage to new communities previously uninsured. A notable example of this is through the application of parametric insurance. Parametric insurance, otherwise known as index-based insurance, refers to insurance where a policy holder's pay-out terms are dependent on the occurrence of a triggering event defined numerically by an index. Owing to advances in data availability and risk modelling, their application to highly complex environmental events has increased. Parametric insurance as a tool transfers risk of economic loss faced by communities reliant on ocean economies to the market. Developing these new insurance mechanisms not only provides ways to mitigate the financial impact of climate-related risks, but does so in a way that reaches the communities and regions of the world with the fewest resources to defend themselves, such as the COAST model developed for Caribbean fisheries (CCRIF SPC, 2019). Owing in particular to the importance of reefs, mangroves, seagrass meadows, saltmarshes, dunes and wetlands to coastal economies and their protection, these ecosystems are likely candidates for development of new parametric insurance. Further application to maritime transport, fisheries and other sectors are also be applicable to parametric insurance.

Investment models

This chapter aims to provide an overview of the existing investment models used for investment in a sustainable blue economy. The featured models are arranged to reflect the types of capital outlined in the previous chapter, and clustered as impact-only, debt and equity-based models, with additional alternative structures listed under the category of hybrid models.

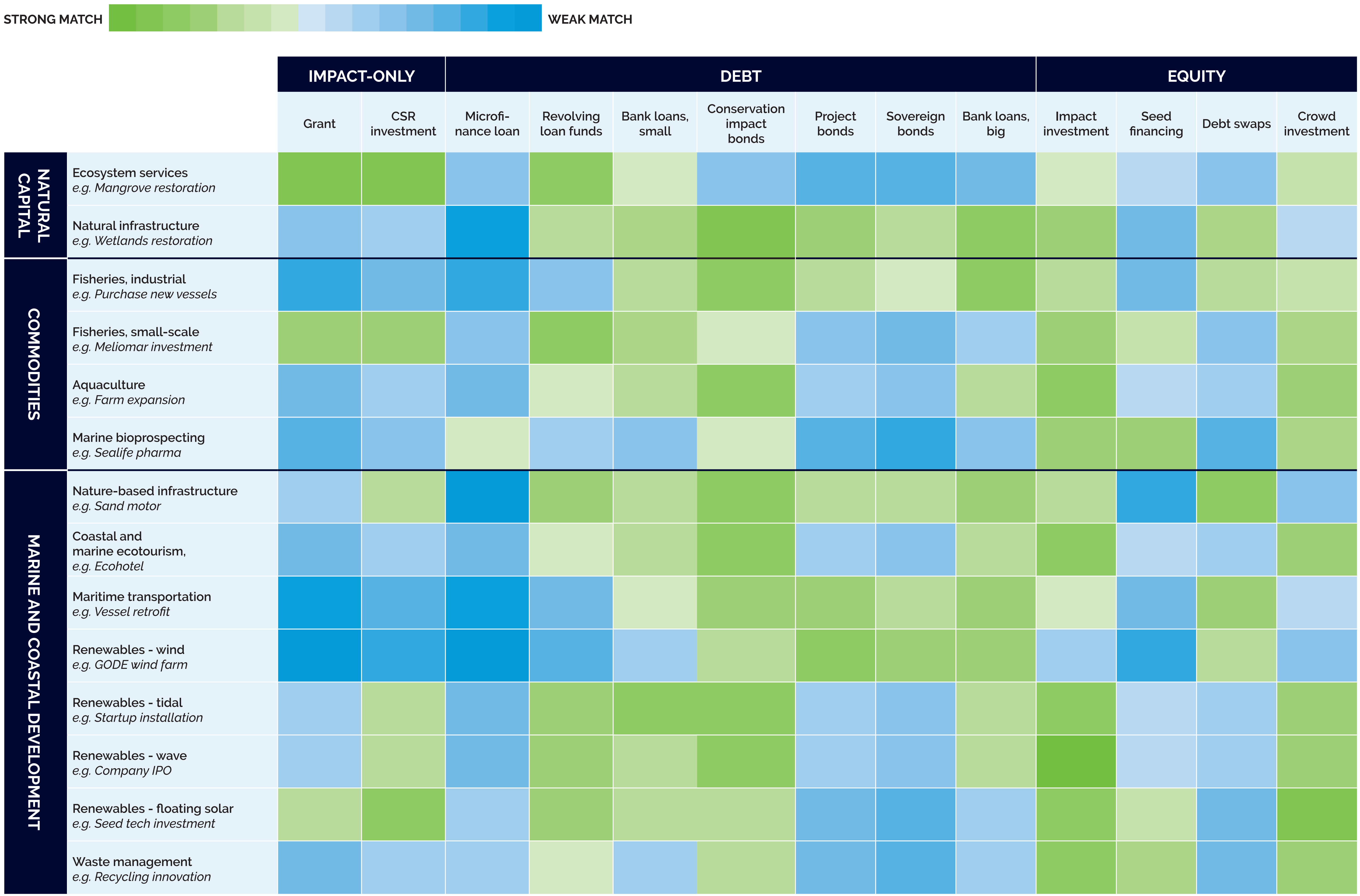
Please note that this is not an exhaustive list, rather a seleciton of models of particular relevance to the blue economy. Each model provides a brief overview of its structure, scale, application, limitations and potential future applications to financing the sustainable blue economy.

To help illustrate the application of different investment models to opportunities in the blue economy, a heat map has been developed to demonstrate goodness of fit between major investment models covered in this paper and sectors of the blue economy, for an average compatibility of scale, risk and risk tolerance, and return potential.

Where the greater the difference in tolerance - or compatibility - between sector and model, the higher the number and bluer the colour on the map. Where tolerances align (for example, both the investment model and the project have similar requirements for scale, risk and level of return), the resulting number in the heat map is low, resulting in a green colour.

Due to the limitations in applicability of the hybrid models to all sectors of the blue economy featured in this report, these models have been excluded from the heat map. It is hoped that the map nevertheless provides some indication as to the potential models for investment in a given sector at the present time, though please note that this is a subjective and indicative mapping, based on the limited available data.

Note that many variables, including how common and accessible an investment model is, the alignment of mission and the difference between perceived and actual risk are not captured and will influence the likelihood of investment. For example, while at face value conservation impact bonds look like a good fit for industrial fisheries, in practice the universality and applicability of bank loans to an established sector like fishing mean a bank loan is the far likelier instrument to use. For further information on the heat map and how it's been created, please see the annex.


STRONG MATCH
WEAK MATCH
IMPACT-ONLY
DEBT
EQUITY
Grant
CSR investment
Microfi- nance loan
Revolving loan funds
Bank loans, small
Conservation impact bonds
Project bonds
Sovereign bonds
Bank loans, big
Impact investment
Seed financing
Debt swaps
Crowd investment
NATURAL CAPITAL
Ecosystem services
e.g. Mangrove restoration
Natural infrastructure
e.g. Wetlands restoration
COMMODITIES
Fisheries, industrial
e.g. Purchase new vessels
Fisheries, small-scale
e.g. Meliomar investment
Aquaculture
e.g. Farm expansion
Marine bioprospecting
e.g. Sealife pharma
MARINE AND COASTAL DEVELOPMENT
Nature-based infrastructure
e.g. Sand motor
Coastal and marine ecotourism,
e.g. Ecohotel
Maritime transportation
e.g. Vessel retrofit
Renewables - wind
e.g. GODE wind farm
Renewables - tidal
e.g. Startup installation
Renewables - wave
e.g. Company IPO
Renewables - floating solar
e.g. Seed tech investment
Waste management
e.g. Recycling innovation

Impact-only models

Grants

Grants, from philanthropic sources as well as development agencies and corporations, are a key existing source of funding for ocean conservation, and have acted as a vital resource for communities, NGOs and early-stage businesses working on developing a sustainable blue economy. They are particularly crucial due to their lack of financial return expectation, making them applicable and useful in contexts that commercial finance is unwilling to consider, notably for projects lacking revenue streams or at the very earliest stages of development. Despite this critical role, grants present a number of challenges in effecting a transition to sustainably financing the blue economy.

- **Scale:** US$50,000 – 50 million
- **Expected returns:** N/A
- **Risk tolerance:** N/A
- **Providers:** Philanthropy, development agencies (ODA), corporations
- **Suited to:** Early-stage (pre-investment) projects across different sectors; particularly relevant to conservation projects
- **Key Examples:** Conservation International Ventures (for the use of grant money as investment capital); funding for the work of the Monterey Bay Aquarium Research Institute (MBARI)

Most grants, with some exceptions, last no more than a year, and are provided either competitively based on a specific concept the donor wants to execute or are proactively sought out by organisations with an idea they want funded. Grant providers for ocean sustainability fall under three broad categories; philanthropy (notably through High Net Worth Individuals and philanthropic foundations), those provided by the public sector as official development assistance (ODA), and grants provided by corporations as part of their corporate social responsibility (distinct from CSR investment featured later in this chapter, where there is some expectation of indirect return). While there are some differences in how money is raised across these categories, the model for how grants are used remains broadly the same regardless of the provider.

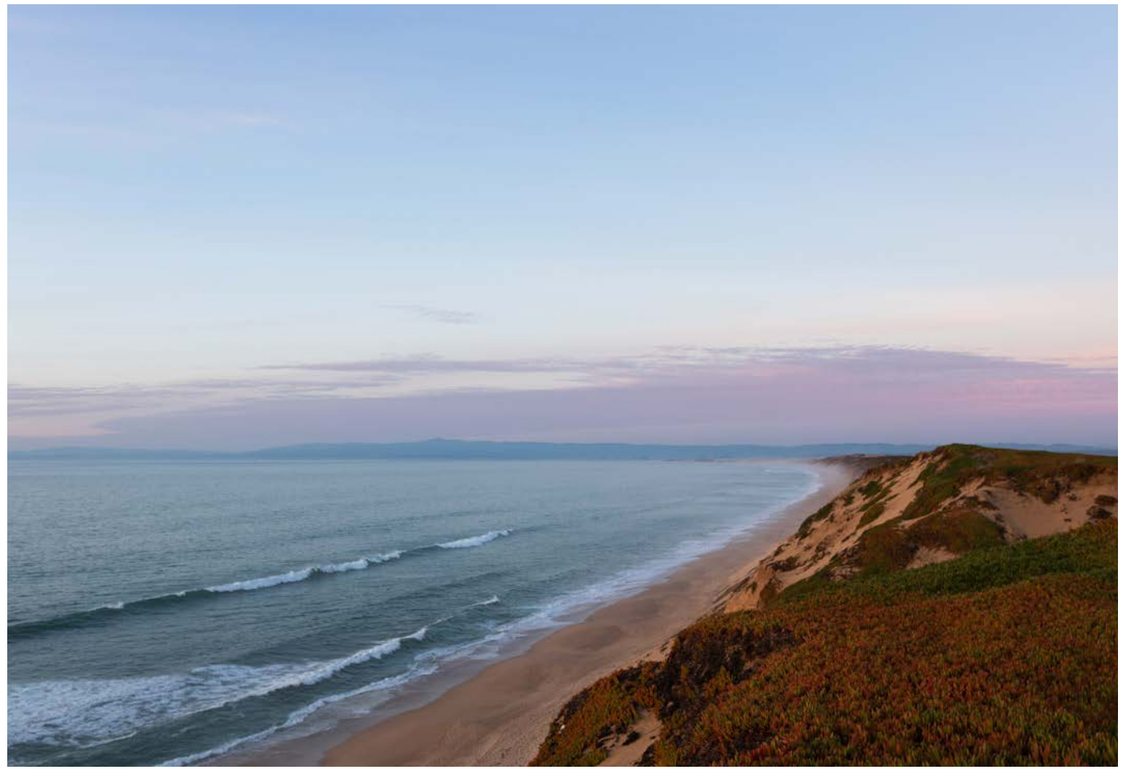
Grants, and philanthropy more broadly, vary wildly in scale, with the largest grants provided to leading institutions in the tens of millions of dollars. However, they remain limited in availability, and not enough grant money exists to fund all the world's conservation and sustainability activities. Many of all the world's most prominent ocean-related NGOs and research entities, including the Monterey Bay Aquarium Research Institute (MBARI), rely heavily on grants to fund their work. They often come attached with very strict reporting and results-based management requirements to ensure targeted social and environmental impacts are being met.

A strong benefit of grants is that they are well-suited to work that enables finance to flow in future, particularly in building out pre- and co-requisites that may be missing in a given geography that are essential to investment. For example, in numerous countries, grant financing has supported work that has led to the development of new policy frameworks for sustainable management, on the basis of which investment can then flow.

While they have clear benefits, grants carry a number of challenges to long-term sustainability of projects. Grants are typically fixed-term with a finite period in which the grant can be disbursed; there is no guarantee that a grant will be renewed after this period ends. As a result, in some instances the progress and changes made under a grant that is not renewed subsequently collapse. This is compounded in projects where no efforts are made to institutionalise newfound expertise or ways of working. Grants can also hamper the development of financial sustainability as they may create a funding dependency that undermines a project's long-term health.

The greatest opportunities for grants in the future, and ways to leverage grant capital for greater good come from blending grant money with other forms of capital. At present, the application of grant funding is often restricted to specific projects or programmes and is not allowed to be blended with other sources of finance. Nevertheless, as demonstrated by some of the initial steps taken for example by Conservation International Ventures, unlocking the use of grant money to enable more ambitious investment in the blue economy presents enormous opportunities for future growth.

Further reading
Funding the Ocean has produced a useful map resource that highlights known grant financing for the ocean that is regularly updated: https://fundingtheocean.org/funding-map.



CSR investment

Corporate social responsibility (CSR) is a form of corporate philanthropy (sometimes called corporate giving), whereby corporations invest non-return-seeking capital for a social and/or environmental good. The distinction with a pure grant comes from a CSR investment indirectly benefiting a corporation's bottom line (for example by fostering the development of a new market or optimising a supply chain). Many CSR investments are in and around a company's relevant supply chain, though in more recent years corporate efforts to build new skills and technical expertise in emerging markets has become commonplace alongside investments to offset negative social or environmental impacts.

- **Scale**: +/- US$23.5 million per corporation per annum (Charities Aid Foundation, 2018)
- **Expected returns:** None direct; indirect returns feature
- **Risk tolerance:** High, often with intent to lower key risks to supply chain/market position
- **Providers:** Large corporations, including retailers (e.g. Sainsbury's) and consumer goods (e.g. Unilever)
- **Suited to:** All sectors, though particularly well suited to supply chainlinked sectors (Payments for Ecosystem Services, fisheries, aquaculture and waste management);
- **Key Examples:** Mars' coral reef rehabilitation (www.mars.com/news-and-stories/articles/coral-reef-rehabilitation) the Ocean Exchange: (www.oceanexchange.org)

CSR is a prominent non-return-seeking financial model that has seen notable applications in the blue economy. There is potential for CSR investment in all sectors of the blue economy (as it depends very much on the priorities of the corporation) but it is particularly relevant for aspects of the blue economy linked to a corporation's supply chains, such as shipping, fisheries, aquaculture and waste management. A notable example is the work of Mars, the consumer goods company, in coral reef rehabilitation. The corporation views this as an important investment not only for conservation objectives but also due to the role of coral reefs as nursery grounds for many fisheries including tuna, from which Mars sources for its pet care division. This is noteworthy as a strategy to reduce a corporation's long-term exposure to risk, in this case supply risk, as an indirect return on investment. Increasingly, CSR has been used as a means for corporations to build new markets for their activities through, for example, investment in infrastructure or education. However, as CSR is unregulated and there are no requirements on how entities disclose their corporate giving, this model can be subject to greenwash, notably in offsetting a corporation's harmful environmental impacts through token investments in CSR. By way of example, many of the large oil & gas corporations invest heavily in CSR for environmental restoration in west African nations, notably the Niger river delta, to offset the harmful impact of their extractive industries (Uduji & Okolo-Obasi, 2018).

As a result, it is important to be mindful of the context in which corporate giving is applied, as well as the motivations of corporate entities and whether these legitimately align with sustainable development. Key pre- and co-requisites supporting CSR investment therefore include a robust legal framework supporting sustainable development, strong monitoring mechanisms and standards to define sustainable behavior, as well as strong assurance frameworks to keep corporations accountable for their investments. Key sources of CSR investment are large corporations, with recent studies showing that the average investment by FTSE 100 members of leading British publicly traded companies amounts to US$23.5 million. Large retailers, notably supermarkets, as well as consumer goods companies, who have a notable role to play in addressing plastic waste, are particularly noteworthy for CSR investment in the blue economy.

While much CSR activity in the blue economy has focused on supply chain interventions, there are numerous opportunities both to scale-up existing supply chain activity (for example building on Mars' broader understanding of what impacts its supply chains by focusing on ecosystem restoration) as well as identify new areas to pursue CSR investments. In the shipping sector, for example, there are significant opportunities for companies to invest CSR resources in decarbonisation and the reduction of ships' environmental footprints – Wallenius Wilhelmsen, for example, believes that it will be possible to offer logistics services with zero emissions by 2050, and is seeking partners to innovate towards its goals through the Ocean Exchange (Wallenius Wilhelmsen, 2018). Equally, the opportunities to share lessons and build new markets for offshore renewable energy is a compelling route for CSR investment by global energy corporations.

Further reading

CSR is a particularly well-studied area and source of funding for sustainable development. Although studies specifically tying CSR to the blue economy are limited, numerous resources are available that unpack the relative merits of CSR, its impacts and its perceived value by both the general public and shareholders. Key resources include the CSR Hub of ratings and rankings of global companies.

Microfinance loan

Microfinance is the application of existing financial instruments at the smallest scale, designed to include the world's poorest in the financial system. While equity-based microfinance does exist, microfinance is typically debt-based and unsecured (with comparatively high interest payments), and can be offered both for-profit by commercial banks and not-for-profit by NGOs and member-based organisations (MBOs) as microfinance institutions (MFIs). According to the World Bank, over 7,000 MFIs exist, with US$7 billion in outstanding loans.

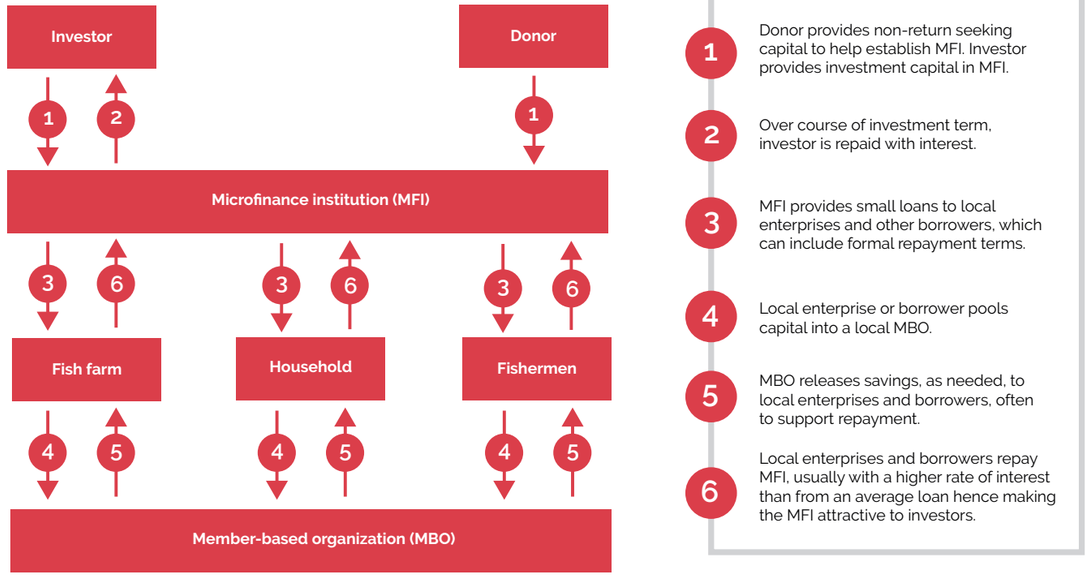
- **Scale**: micro, <US$50,000 (often <US$1,000 in emerging markets)
- **Expected returns:** global average 37%, as high as 70% for some (MacFarquhar, 2010)
- **Risk tolerance:** high, as reflected in interest rates
- **Providers:** commercial banks, member owned organisations and NGOs
- **Suited to:** small-scale fisheries and aquaculture, local applications of ecotourism and waste management
- **Key Examples:** commercial bank: Grameen Bank, (www.grameen.com); NGO: SIFFS (www.siffs.org)

In the sustainable blue economy, microfinance has been applied to small-scale fisheries and aquaculture, particularly for capital expenditure in purchasing new vessels or gear, in the case of fisheries, and operating expenditure in aquaculture in the purchase of feedstock. Key markets for microfinance include the Indian subcontinent and Africa, however the principles of microfinance and its applicability are universal. Microfinance is not without criticism, and recent literature suggests it is highly dependent on several pre- and co-requisites (see chapter 3) for modest success (World Bank, 2017); notably, the existence of a wider ecosystem of actors to create financial inclusion, including supportive public subsidies, access to other financial products (notably saving accounts) and, crucially, financial literacy among end users.

For fisheries and aquaculture, microfinance faces some additional challenges, notably in linking provision of credit to sustainable fishing practice, which is directly tied to the profitability of the sector. Additionally, many small-scale fisheries struggle with financial independence from middle-men who typically both provide loans and buy the fish from fishers; here, microfinance needs to work within the context of the local community and be sensitive to local dynamics in reforming access to finance and achieving long-term success. The South Indian Federation of Fishermen Societies (SIFFS – www.siffs.org) offers an example of the role microfinance can play in giving primary producers greater control over their products.

As of 2017, 1.7 billion people worldwide remain unbanked, notably in Bangladesh, China and India. As a result, substantial opportunity remains to extend financial inclusion, particularly through technology – two-thirds of un-banked adults have a mobile phone (Demirgüç-Kunt et al, 2018). At the same time, many parts of the world, notably Africa (a net importer of fish), have strong growth potential for fisheries and aquaculture. Offering micro loans, in tandem with public and philanthropic efforts to improve governance and sustainability practice, may enable rural and coastal communities to access short-term credit to lift out of poverty and graduate to larger-scale financing, notably impact investment.

The Grameen Bank provides a helpful methodology (www.grameen.com/method-of-action) for successful and inclusive microfinance that offers guidance on how to avoid some of the common pitfalls of microfinance mentioned above.



Further reading

MIX market (www.themix.org) provides comprehensive data on financial inclusion and microfinance which, alongside the Global Findex Database, provides insight to the state of microfinance.

Revolving loan fund

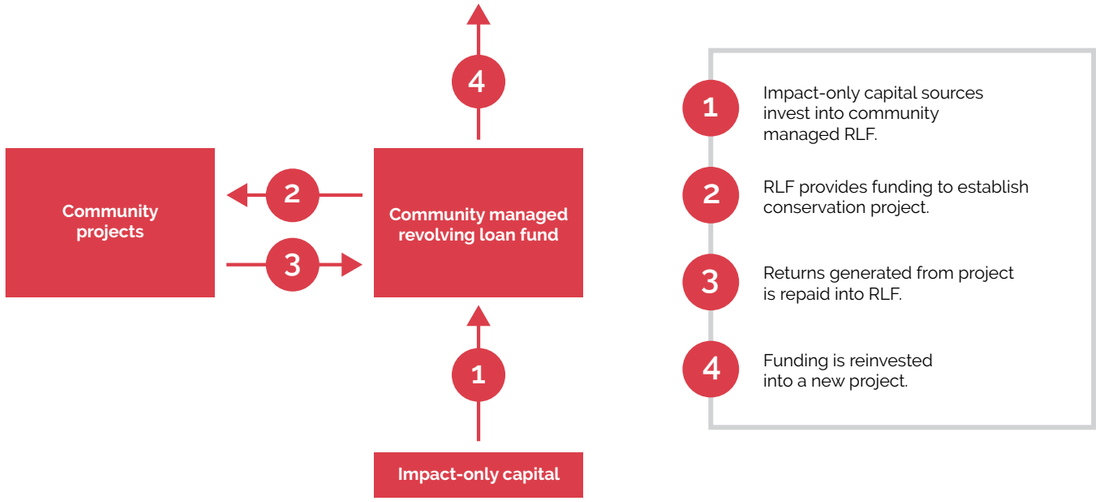
Revolving loan funds (RLFs), sometimes referred to as green revolving funds, provide lending to smallholders and small business owners who cannot otherwise access capital. In this respect, revolving loan funds share some common features with microfinance. In a revolving loan fund, loans are allocated from a central fund, which is replenished as individuals pay back their loans. Once replenished, the fund can then issue new loans to other actors, hence 'revolving'. Like microfinance, revolving loan funds (RLFs) have a high tolerance for risk and can be more flexible on borrowing terms (including what collateral to accept) than more traditional lending institutions.

- **Scale:** Typically in the 'missing middle', US$20,000 – US$3 million
- **Expected returns:** Typically 5-8%
- **Risk tolerance:** Very high
- **Providers:** Specialised loan funds. May be part of a broader Conservation Trust Fund.
- **Suited to:** SMEs and other actors seeking credit across a variety of sectors unable to attract mainstream financing (notably in fisheries, but also community conservation projects and protected areas)
- **Key Examples:** California Fisheries Fund

Revolving loan funds are used worldwide for communities, businesses and individuals who may be either too small or considered too risky for a loan from a commercial bank. They typically fund non-return seeking projects in the 'missing middle' of finance, with the smallest investments around US$20,000 ranging up to US$3-5 million. Loans are repaid as a project matures and in the event of default the loan is typically forgiven. To date, RLFs have not featured prominently in the development of a sustainable blue economy, with a greater focus on their application on land. A notable exception to this is in fisheries, where a revolving fund is able to offer assistance to fishers seeking to renew vessels, gear, or purchase fishing quota. The California Fisheries Fund is a noteworthy example of a fisheries-specific revolving loan fund. RLFs are typically financed by a blend of philanthropy, government funding and private investment. Some multilateral organisations, including the GEF and World Bank, will participate in RLFs. Many RLFs are managed at the community level, where local stakeholders determine fund recipients. Here it is important to ensure that such community-led funds are carefully monitored to assure investors that funds are responsibly spent.

While more flexible than more traditional financing, RLFs may require collateral in some circumstances, though they can be more flexible in what form of collateral they are willing to accept than commercial institutions. The California Fisheries Fund, for example, accepts gear, vessels, quota and personal guarantees as collateral when disbursing loans to fishers (Community Vision, 2019). In order to support their development for a marine context, key pre- and co-requisites for RLFs include a strong legal basis for them to operate within, as well as the aforementioned requirements to be able to collateralise a project even if there is no expectation of return. Equally, for community-managed funds, building and reinforcing financial literacy and rigour is vital to the success of an RLF.

While RLFs in the blue economy have notably been applied in a fisheries context (and there is certainly scope for expanding their use here), on land many RLFs have been dedicated towards energy efficiency investments and emissions reductions projects. Potential use in the blue economy therefore can be scaled to include, for example, projects that promote energy efficiency and decarbonisation in shipping, and community-based investments to improve energy efficiency in coastal tourism, fish processing or waste management facilities. More broadly, RLFs are ideally suited towards community-based efforts, and are a valuable mechanism for financing community monitoring of MPAs, coastal clean up and waste management efforts or mangrove restoration.



Adapted from Orskov Foundation (2019).

Further reading

The World Bank has produced somewhat dated guidance on best practice for community-led RLFs here: http://siteresources.worldbank.org/INTCDD/Resources/mf4.pdf. The US Economic Development Administration maintains guidance on RLFs for economic development programmes here: www.cdfa.net/cdfa/cdfaweb.nsf/pages/edarlfprogram.html. More information on the California Fisheries Fund is available here: https://communityvisionca.org/cafisheriesfund.

Bank loans

Bank loans are among the most common financial instruments, and a particularly valuable tool for early-stage project ideas, provided the borrower is financially solvent and, due to bank loans typically being unsecured, has a clear means to repay the loan. For most projects, if there is a clear means to repay the loan and banks are available to lend capital in a given market (a constraint in remote communities and some emerging markets) a loan is a straightforward and often most advisable means of raising capital. However, for this same reason, loans are not applicable to many aspects of the sustainable blue economy, particularly those requiring new finance.

- **Scale:** Moderate to large
- **Expected returns:** Typically 4-20% in interest rate dependent on the scale and market of the loan
- **Risk tolerance:** Medium
- **Providers:** Commercial banks
- **Suited to:** Most 'mainstream' projects where borrowers have demonstrable means to repay the loan. Within the blue economy, this means existing bank loans are suited to established sectors that aren't trying to do anything innovative, for example in lending to a mainstream fishing company or coastal resort.

Commercial bank loans are, in principle, widely applicable to many blue economy sectors and the enterprises that operate within it. They provide fixed term, medium- to long-term finance options for businesses of varying size. These loans are accompanied by an interest rate and a repayment plan. Loans of this nature can help enterprises with cashflow issues, whilst also providing upfront capital for investment in high capital infrastructure, for example. Thus, a bank loan is a debt instrument – repayable with interest. Loans can either be 'secured' (where collateral in the form of assets are agreed on the outset as payment should the borrower default) or 'unsecured' (where collateral is not required). The latter are more commonly personal loans. Broadly, loans can be categorised as small, personal loans (up to US$1 million, for things like small businesses or mortgages) and large, corporate loans (more often in the 10s of millions of dollars).

Lenders place scrutiny on aspects of a business' financial sustainability and project viability when assessing suitability; this can include scrutiny of business strategy, cashflow and other areas. Smaller businesses and start-ups can find it difficult to obtain commercial bank loans as a result of this, due to unproven profitability and cashflows (leading to lack in confidence from banks that loans should be paid back). In uncertain financial climates, such as in recent times, commercial banks become increasingly risk-averse to providing credit due to uncertainty regarding the likelihood a business might repay loans; increasing stipulations on borrowing companies.

Key pre- and co-requisites for loan provisions therefore include: sound business operation, financial literacy and business planning; collateral availability and/or stable cashflow. As noted, investment climate also plays a major role in the willingness of banks to provide loans. For bank loans to become more suitable to the development of the blue economy, an improvement in the sustainability literacy of borrowers, understanding the differences between sectors of the blue economy and lowering the perceived risk of investment will be key.

In relation to the blue economy, commercial loans have wide applicability to a range of sectors at play. However, issues outlined above remain as obstacles to the less well-established of these sectors. Furthermore, commercial loans, in and of themselves, do not often necessitate sustainable practices by the lender. However, there is growing recognition that lenders can play a major role in shifting corporate behaviour on important issues to achieve improved operations in specific sectors. The Poseidon Principles, designed to enable more sustainable shipping, are an example of such effort with impacts on banking.

The United Nations Environment Programme Finance Initiative (UNEP FI), well known for previously developing the Principles for Responsible Investment (PRI) and Principles for Sustainable Insurance (PSI) have recently developed the Principles for Responsible Banking (www.unepfi.org/banking/bankingprinciples), which outline key steps and activities lenders can undertake to better incorporate sustainability into their decision-making, improve their environmental impact and enable shared prosperity with their customers.

Conservation Impact Bond

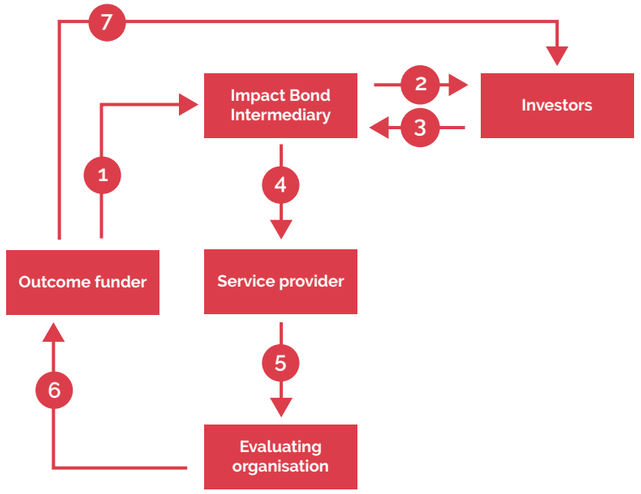
Conservation Impact Bonds (CIB), or Environmental Impact Bonds (EIB), refer to financial packages where private capital is invested upfront for a conservation initiative or scheme, against agreed measurable conservation outcomes. They closely replicate Pay-for-Success (PFS) and Pay-for-Performance (PFP), where investors finance environmental or conservation-based schemes with contracting parties paying for services based on agreed and prescribed outcomes. Investees work with governments, philanthropic institutions and NGOs to support deal structuring. When agreed conservation outcomes are verified, the investor is repaid.

- **Scale:** Moderate
- **Expected returns:** Low to moderate
- **Risk tolerance:** Moderate
- **Outcome funders:** Foundations or philanthropists; international financial institutions (IFI); governments; non-profits; corporate giving.
- **Investors:** Foundations or philanthropists; impact investing firms; banks; investment funds; institutional investors.
- **Service providers:** NGOs; community
- **Suited to:** Fisheries; Carbon sequestration; Nature-based infrastructure
- **Key Examples:** Louisiana Wetlands EIB (www.edf.org/sites/default/files/documents/EIB_Report_August2018.pdf), Rhino Impact Bond.

Awareness of outcome-focused investment and financial vehicles has grown in recent years, due to their potential to attract private capital to conservation finance and bridge the 'conservation finance' gap. Owing to investors only being provided returns should outcomes be achieved, they are designed to reduce the risk of outcomes not being achieved; leading to improved results, innovation and increased capital flow. In principle, conservation outcomes are thus met more efficiently. The structuring of CIBs commonly involves the participation of private investors, NGOs, community-based organisations (CBO) (or a conservation service provider), and an institution that provides capital should the agreed outcome of the Bond be realised - often a government, philanthropist or NGO.

The success of Impact Bonds is highly reliant on being able to accurately measure specific outcomes that the bond has been raised to achieve. As such, a prerequisite for its function is sufficient technical and knowledge capacity to permit accurate before-and-after impact comparison, so that agreed outcomes on which the Bond is dependent can be appropriately assessed. Conservation impact bonds aim to monetise future cost savings on a targeted environmental outcome (defined, with performance indicators, when the investment is structured – for example a % of an MPA covered by enhanced enforcement). The cost saving is derived from implementing more efficient, targeted conservation programs. Once the targeted environmental outcome is achieved and verified, the investor can expect to recoup her capital, plus interest. However, should an intervention underperform when compared to performance indicators, then the investor would expect to receive little or no interest. For applications to the green economy, a key case study of Impact Bond use is 2016's DC Water financing of green infrastructure projects to manage water runoff. Whilst application to the blue economy is nascent, evidence of their application to coastal ecosystems in order to enhance coastal resilience and protection has been one area where the Impact Bond principle is considered applicable (Herrera et al., 2019).

As an investment vehicle, they are scalable from local to landscape-level conservation. Theoretically, they can be utilised for any project for which commonly agreed, sufficiently robust monitoring and data evaluation techniques exist. Nature-based infrastructure represents a key opportunity for further use of impact bonds. Here, reduced land loss and flood risk can be used as metrics.



1. Outcome funder (e.g. government, NGO, public utility) defines outcome contract, with targeted environmental outcomes to intermediary, to whom they pay service fees.
2. Intermediary designs and structures bond deal, and seeks investors.
3. Investors provide up-front capital.
4. Intermediary contracts service provider to perform conservation activities.
5. Environmental outcomes are achieved, and then assessed via a third party evaluating organisation.
6. Evaluator verifies environmental outcomes to outcome funder.
7. Outcome funder repays investors, with financial return, based on achievement of environmental outcomes.

Adapted from: CPIC EIB Blueprint

Further reading

EDF's Louisiana impact bond can be found here: http://cpicfinance.com/wp-content/uploads/2019/01/CPIC-Blueprint-Case-Study-Environmental-Impact-Bond-for-Coastal-Green-Infrastructure-by-Environmental-Defense-Fund.pdf

And further reading on the Rhino Impact Bond can be found here: www.thegef.org/project/rhino-impact-bonds-innovative-financing-mechanism-site-based-rhinoceros-conservation.

Project bonds

Bonds vary based on who issues them, and can be subdivided into private (corporate and project) bonds and public (sovereign and municipal) bonds. Structurally, they remain similar (though not identical, as public bonds tend to be lower-yield than private) and here we describe project bonds as an example of bonds more broadly. In the private sector, project bonds are bonds raised specifically to finance the operations of a specific project – such as a new wind farm or factory – and which will be paid back exclusively by the proceeds from this one activity, without recourse to the issuer's other potential revenue streams. Related to project bonds, corporate bonds are bonds raised by a corporation, to support efforts to expand, acquire or (re)capitalise specific business areas. They are repaid through the corporation's revenue streams.

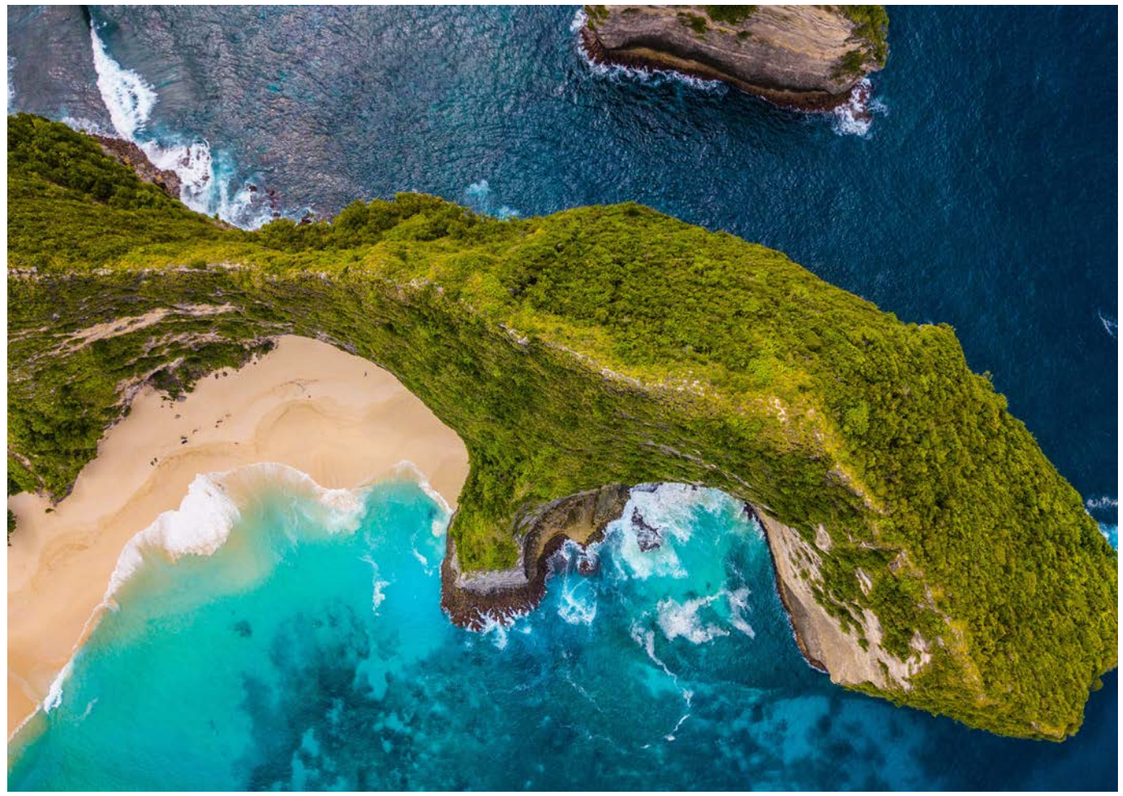
- **Scale:** Moderate to high
- **Expected returns:** Moderate
- **Risk tolerance:** Moderate
- **Providers:** Governments, commercial banks, private finance
- **Suited to:** Maritime transport, ocean-based renewable energy.
- **Key Examples:** Gode Wind (Ørsted); Nippon Yusen Kaisha Shipping Green Bond

With public finance in shorter supply following the Global Financial Crisis, and demand for investment in much needed infrastructure curtailed by fiscal constraints placed on banks through lending requirements, project bonds have emerged as an increasingly prevalent and widely-used (both sectorally and geographically) financing option for large-scale infrastructure projects. In regard to their applicability to the blue economy, project bonds exist at the very large end of the financing spectrum, with individual bond issuances typically worth >US$100 million.

Project bonds seek to secure financing for specific projects from capital markets, as opposed to borrowing from banks. As such, they provide an avenue for institutional investors to invest through securities in infrastructure projects. Project finance structures, such as project bonds, are often employed by the capital markets to finance these kinds of large projects or initiatives. It is possible for project bonds to both be listed on stock exchanges and to function on an unlisted basis. Infrastructure investments and, as a result, project bonds are attractive to various investor categories with long-term liabilities, such as pension funds and insurers, owing to long maturity, as well as the fixed rate nature of project bonds. As a result, they are most suited to large-scale infrastructure projects around the ocean, and their application has tended towards ocean-based renewable energy and maritime transportation infrastructure. In the realm of the green economy, they have been readily utilised to finance renewable energy projects, notably wind installations, where they also demonstrate significant blue economy potential through financing offshore fixed wind installations.

Further illustrating their wide applicability, the Japanese shipping company, NYK, recently issued a 'Green Bond' with its proceeds to be used towards liquefied natural gas (LNG)-fuelled ships, ballast water treatment equipment, sulphur dioxide scrubber systems, and LNG bunkering vessels. While still focused on a carbon-intensive industry, the issuance of a project bond in this context enables large corporate actors to finance pathways to decarbonisation and alternative energy infrastructure. Key prerequisites for project bonds therefore include a robust investment climate in the target geography and financial institutions that can support financial attractions at the scale of a project bond. They also require very clear legal frameworks for recourse and accountability and, crucially, sufficient scope for scale. This latter point is a key barrier to the increased applicability of project bonds in the blue economy space – at present, very few sectors can meet the scale requirements for a bond issuance of this type. Nevertheless, as additional technologies for marine energy generation become more mainstream (notably wave and floating solar energy), the potential for project bonds to be used to finance the deployment of marine renewable infrastructure will only increase. As this occurs, an important consideration will be how project bonds account for the potential environmental impact of projects they're financing. Additionally it will be important to ensure compliance with, for example, the climate bonds standard for bonds and green bond principles on environmental and social sustainability.

Further reading
Credit Agricole has provided a useful (though not sustainability-specific) overview of project bonds, while the Climate Bonds Initiative (www.climatebonds.net/standard) and International Capital Markets Association have produced guidance on sustainability in bonds (www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp).



Sovereign bonds

Bonds vary based on who issues them, and can be subdivided into private (corporate and project) bonds and public (sovereign and municipal) bonds. Structurally, they remain similar (though not identical, as public bonds tend to be lower-yield than private).

The mechanism for a sovereign bond is much the same as for a corporate or project bond, with the main difference being that the issuer is a sovereign entity and, as a result, the appetite for risk is usually lower than in the private sector. As a result, the coupon is typically a lower yield.

- **Scale:** Moderate to high
- **Expected returns:** Moderate (typically lower than corporate or project bonds)
- **Risk tolerance:** Moderate (typically lower than corporate or project bonds)
- **Providers:** Governments, international financial institutions
- **Suited to:** Any sector where government has identified a development need, provided scale exists
- **Key Examples:** Seychelles blue bond; Norges Investment Bank Baltic blue bond

Sovereign bonds have been prominently showcased in the blue economy in recent years, notably through the creation of the worlds first sovereign blue bond in the Seychelles. The Seychelles blue bond was established by the government of the Seychelles to finance the establishment and operation of a series of projects for marine conservation and sustainable fisheries. Proceeds from the bond will include support for the expansion of marine protected areas, improved governance of priority fisheries and the development of the Seychelles' blue economy. Grants and loans will be provided through the Blue Grants Fund and Blue Investment Fund, managed respectively by the Seychelles' Conservation and Climate Adaptation Trust (SeyCCAT, which also manages the Seychelles debt swap (see debt swap model) and the Development Bank of Seychelles.

Key to the success of the Seychelles bond was the committed engagement of a number of stakeholders, including the GEF and the government of the Seychelles, to get the bond off the ground. Without the high level of political willingness to strike a deal (helped in part by the momentum created around the debt swap, which was a parallel process) it is unlikely the issuance of the bond would have been successful, and it nevertheless still took several years to complete the transaction.

For blue bonds to scale, the process involved in structuring and issuing the bond must become much more streamlined, and suitable projects at the right scale – at a minimum, tens of millions of dollars - must be readily identifiable.

Further reading
The Blue Natural Capital Financing Facility has published a useful guide to Blue Bonds, also highlighting obstacles inhibiting their wider scaling. (www.4climate.com/dev/wp-content/uploads/2019/04/Blue-Bonds_final.pdf).

Equity models

Impact investing

The Global Impact Investing Network (GIIN) defines impact investing as investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return. While equity is a common feature, impact investment models are often blended, and can include debt and several capital providers to create and support the environment in which an investment is likely to be successful and profitable. Because of this flexibility and alignment of goals between actors, impact investment can be suitable to a wide variety of projects. It is worth highlighting that the distinction between impact, seed investment and venture capital is a grey area with substantial overlap.

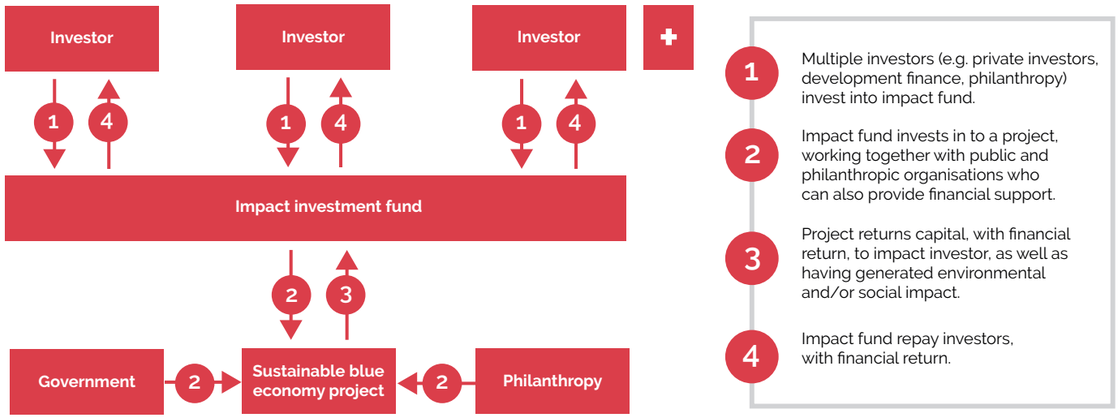
- **Scale:** US$500,000 – US$2 million per project
- **Expected returns:** 5-10% (risk-adjusted), often lower in emerging markets (GIIN, 2017)
- **Risk tolerance:** Medium to high
- **Providers:** Impact investment funds, who aggregate capital from private and development finance sources
- **Suited to:** Natural capital projects (blue carbon, payment for ecosystem services, fisheries, aquaculture, MPAs)
- **Key Examples:** Althelia's Sustainable Ocean Fund (www.althelia.com/sustainable-ocean-fund); Sky's Ocean Ventures (www.althelia.com/sustainable-ocean-fund)

Impact investment is prominent in both green and blue economy financing, though as it often relies on forms of development finance resources to raise capital, it is generally more common in the developing world. To date, impact investments in the sustainable blue economy have taken place in projects with a focus on natural capital and product innovation. Impact funds in the blue economy typically raise <US$100 million, in part because of a lack of investable projects at the appropriate scale and risk-adjusted return, alongside general uncertainty around investment in the ocean. This makes fundraising from both private and development finance sources more challenging than in terrestrial investments, where impact funds are typically larger. It is difficult to quantify the exact scale of impact investment in the ocean, as many impact funds may bundle ocean investments within more general environmental funds. However to date, the total value of known funds specifically focused on the blue economy amounts to at least US$200 million, across funds focusing on plastic waste, fisheries, aquaculture, protected areas and coastal development. Key prerequisites for impact investment include strong political willingness from development institutions as well as the project country's government to engage with the impact investors, clearly identified collateral, as well as sufficient financial literacy and business planning capacity from the target project to engage with investors. Of these, the latter two may be supported through technical assistance by the impact fund's partners (notably NGOs and development institutions) to bring projects up to investment readiness.

Globally, investors signaled an intention to disburse US$5.6 billion in impact investments between 2014-2019 (NatureVest & EKO AM, 2014). The sustainable blue economy has not received a significant share of this investment, and abundant opportunity exists to scale up investment in existing sectors as well as new areas of the blue economy through innovative investment models that rely more heavily on partnership with other efforts – for example in financing sustainable tourism and new enterprise around MPAs (Iyer et al, 2018).

The key challenge is replicability and scalability of existing investments – fortunately, many organisations have begun to develop blueprints (see below) to facilitate project replication and provide a standard framework for impact investing in the sustainable blue economy.

The schematic below represents a hypothetical blended impact fund approach, where private finance investments and development finance investments invest in a fund, which deploys capital towards an investment project, with public and philanthropic support.



Further reading
The GIIN has a number of resources on impact investing, notably the *Core Characteristics of Impact Investing* (https://thegiin.org/characteristics) that define the baseline of expectations of impact investing. Encourage Capital has developed investment blueprints for fisheries (http://investinvibrantoceans.org/), as has the Coalition for Private Investment in Conservation (www.cpicfinance.com).

Seed financing

Seed financing is a high-risk, early-stage investment round for new companies. Equity-based, seed financing tends to rely on a combination of informal lending through family and friends as well as angel investors (capital providers who invest their own money, as distinct from VC which invests others' money) and venture capitalists. Seed financing is often the very first round of investment for a start-up and is common across many sectors, with notable prominence in technology-based investments. It is often linked to project accelerators or incubators to build pipeline. Proceeds are typically used for product development, market research and other upfront capital expenditure.

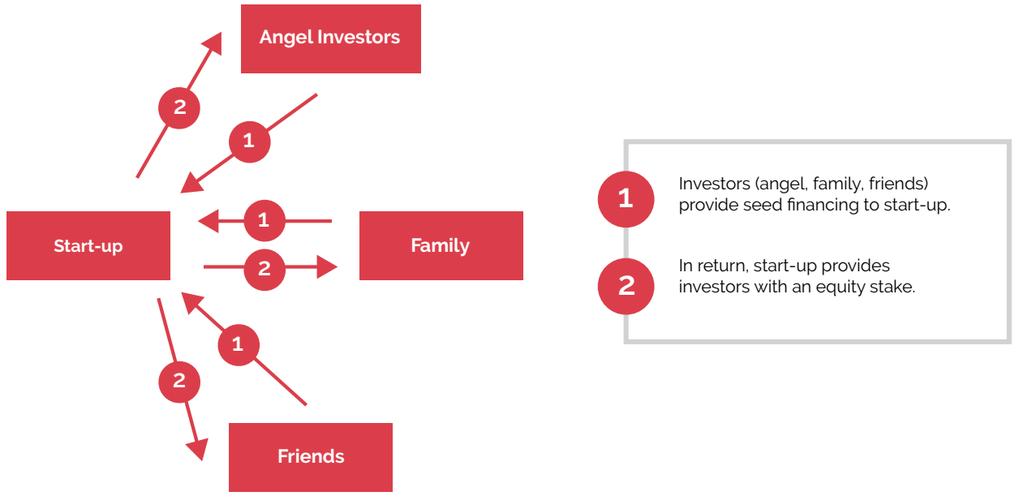
- **Scale:** Small (<US$1 million)
- **Expected returns:** Variable. High failure rate makes seed financing high-risk, high-reward.
- **Risk tolerance:** Very high, investors participate based on belief in the idea of the product.
- **Providers:** HNWIs as angel investors; venture capital funds such as Katapult Ocean (see case study)
- **Suited to:** Early-stage projects across sectors – notably bioprospecting, renewables, aquaculture, shipping
- **Key Examples:** Coral Vita (www.coralvita.co/); Fish2.0 (www.fish2.0.org/), the European Union's BlueInvest programme (https://webgate.ec.europa.eu/maritimeforum/en/frontpage/1451)'

Seed financing is not a novel mechanism or sustainability-focused financing approach like many other models in this chapter. As such, its application to the blue economy can be universal – as long as a business has a good idea and is at an early stage, it is in a position to attract seed financing. Because it is so commonplace, estimating the scale of seed financing is difficult. To receive seed financing a business needs an idea or approach that can be scaled up in an existing marketplace; efforts based purely on finding new ways to finance sustainability without a clear product (such as payments for ecosystem services) are unlikely to attract seed financing. Key pre- and co-requisites for seed financing therefore include financial literacy, a supportive investment climate and a robust business model and plan. There is a substantial perceived gap between the need for early-stage investment capital in blue economy projects and the availability of seed capital (ImpactAssets, 2012). The high-risk approach typical to seed financing collides with the reduced financial returns in exchange for environmental benefit typical to sustainable financing. Given the uncertainty surrounding investment in many aspects of the blue economy, these challenges are compounded in the ocean.

Innovative entrepreneurs, and those considering technologically-driven products that offer an attractive return (in addition to working towards a sustainable blue economy) are best placed to attract seed financing. Companies such as Coral Vita provide examples of entities with novel approaches to solving unique blue economy and conservation challenges that can attract seed capital to scale up and grow. Accelerators and incubators, which help businesses become ready for seed financing, are of great help in building new projects for investment. Some, such as Fish 2.0 and Katapult Ocean, are geared specifically to developing sustainable seafood or fostering a sustainable blue economy.

As highlighted, seed financing is a traditional part of the investment landscape, with broad application potential in the sustainable blue economy, provided that pre-conditions for investment can be met. Aquaculture, bioprospecting, renewable energy generation and other sectors where innovation and solutions can plug into an existing marketplace will be better placed to raise seed capital.

As investor confidence in the blue economy grows, the availability of seed financing will likely increase. In the interim, grant capital that supports sustainable development innovations (such as the EU's Horizon 2020 funds) as well as impact investment that doesn't operate on a high-risk, high-reward model are viable alternatives to pursuing seed financing.



From: Corporate Finance Institute (2019) What is seed financing.

Further reading
ImpactAssets (www.impactassets.org) maintains a number of excellent resources on raising seed capital in the context of impact investment. Many of the challenges and potential solutions considered apply in the context of the sustainable blue economy.

Crowd investment

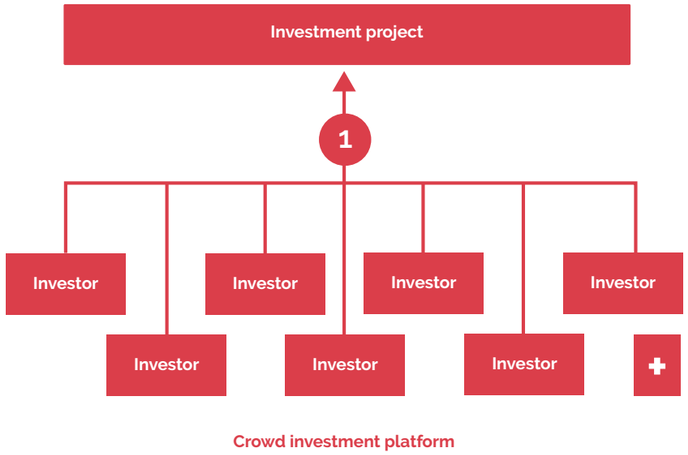
Crowd investment is a form of seed equity investment where investors are aggregated through an online platform. Individuals, through the use of the platform, can chose to invest relatively small amounts (typically <US$1,000) which are aggregated with other individuals to purchase equity stakes in a start-up. This opens up investment opportunities both to start-ups that may not have a business profile able to attract traditional investment as well as to investors who don't have the capital to invest at a larger scale, potentially unlocking substantial new sources of finance. It should be noted that the risks are similarly high as in any other seed investment, if not higher for concepts unable to attract more mainstream finance.

- **Scale:** Typically <US$1 million
- **Expected returns:** 5-10%
- **Risk tolerance:** High, if mission-aligned investors can be found through platforms
- **Providers:** Platforms such as CrowdCube/Indiegogo
- **Suited to:** Any blue economy sector with a clear product/service; particularly rich vein for bio-prospecting, renewables and technological applications for other sectors.
- **Key Examples:** BlueRise successfully raised €657,000 in crowdfunding, though unfortunately went out of business.

Multiple crowd investment platforms have developed in recent years, offering a selection of investment opportunities across sectors. Nevertheless ocean and sustainability investments appear only sporadically on big crowdfunding sites such as Indiegogo and CrowdCube, though the overall level of interest in crowd investment as a source of financing for sustainability has been increasing steadily since 2013 (Martinez-Clement et al, 2019). Many of the same prerequisites and conditions regarding seed financing also apply to crowd investment, notably the importance of a clear business plan and marketable product/service in the investment. Similarly, many of the same risks of investment in start-ups also apply – for example, one of the best-known crowd investments in a sustainable blue economy project was in BlueRise, a Dutch renewables start up focused on ocean thermal energy conversion (OTEC) which successfully raised €657,000 in seed capital through a crowd investment campaign offering a 6% interest rate on crowd platform Symbid. Unfortunately, the company was unable to attract subsequent investment and folded in early 2019. This clearly demonstrates the inherent risks that remain in early-stage investments. However, crowd investment faces some jurisdictional challenges as in many countries soliciting investment from the general public is illegal, unless an investment opportunity has been filed with an appropriate securities regulatory authority such as the US Securities Exchange Commission (SEC). Since the development of crowd funding platforms, many countries have developed regulation permitting its use, but it is worthwhile verifying the legality of crowdfunding in any given jurisdiction.

Nevertheless, crowd investment offers a mechanism for mission-aligned investors to easily identify projects that match their priorities and expectations, and are an example in their own right of the power of technology and the internet in building a new way of financing sustainability.

There are substantial opportunities to increase the level of crowd funding for blue economy projects worldwide, as the nature of the investment is well suited towards identifying and engaging with mission-aligned investors across a range of sectors, provided there is a clear investment case to be made. The disaggregated nature of the internet means that crowd funding has the potential for success regardless of geography, provided the relevant jurisdictions allow for online investment platforms. As for more traditional seed investment, crowd investment is an excellent jumping-off point towards subsequent, larger investments.



Crowd investment platform

1 Multiple individuals invest, through a crowd investment platform, into their desired project. In return, they receive an equity stake – or alternative reward.

Further reading
Numerous crowd investment platforms exist besides the larger, better-known Indiegogo and CrowdCube. StartEngine (www.startengine.com), Symbid (www.symbid.com), Seedrs (www.seedrs.com) and many others operate in different geographies and currencies.

Hybrid models

Conservation Trust Funds

Conservation Trust Funds (CTFs) are private legal entities that provide grant-funding for conservation (Conservation Finance Alliance, 2013). CTFs have varied financial arrangements, though many begin by managing a single endowment or sinking fund, capitalised by donors, national governments and the private sector, the interest from which is used to provide grant financing to conservation activity. They can be thought of as a 'bridge' between donors and implementing organisations. Recipients typically include NGOs, CBOs and government agencies. In 2012, CTFs managed over US$672 million in endowments and sinking funds (ibid).

- **Scale:** Funds typically in the range US$10-120 million, the GEF suggests minimum capitalisation of US$5 million
- **Expected returns:** NA
- **Risk tolerance:** Very high
- **Providers:** Philanthropy, government funds.
- **Suited to:** Protected areas and non-return generating projects (e.g. in fisheries, blue carbon); Payments for Ecosystem Services
- **Key Examples:** FMCN (multiple funds) (www.fmcn.org/en); BACoMaB (single fund www.bacomab.org); Blue Abadi Fund (mixed endowment/sinking fund in a CTF) https://tinyurl.com/rwcmsqr

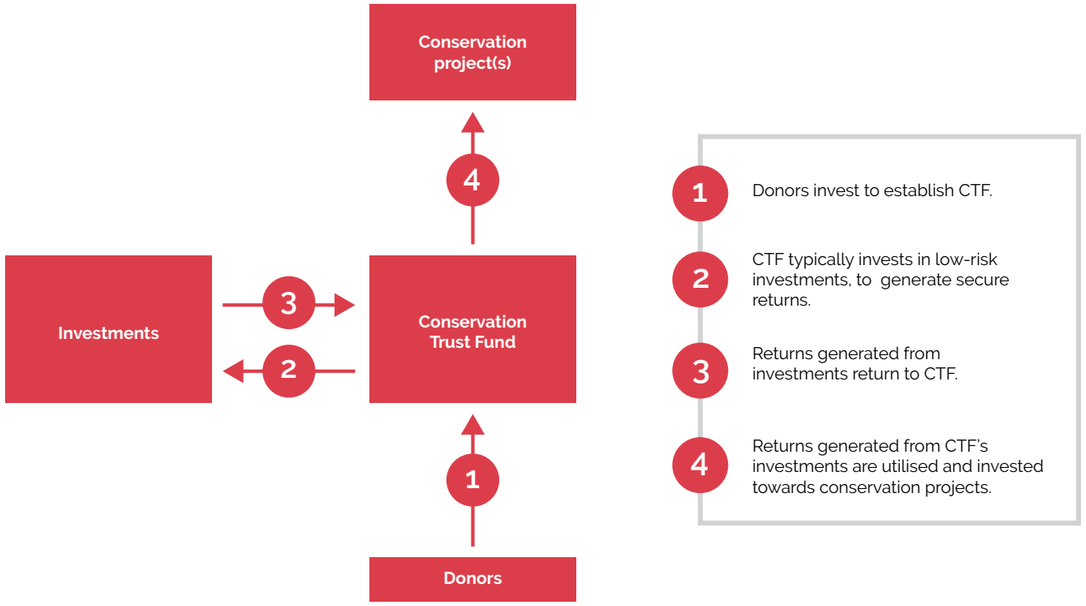
CTFs (sometimes referred to as environmental trust funds) have been in use for more than two decades, with a notable focus on conservation-specific projects and activities. In the blue economy, this has seen particular application in finance for protected areas, notably around coral reefs and mangrove forests. CTFs are based on endowments, revolving funds or sinking funds, typically a large sum of money that generates interest which finances conservation activity (sinking funds are designed such that they decline in scale over time until no funds are left). CTFs with endowments or revolving funds will typically invest a portion of their capital in secure, low-risk investments to generate further income to maintain the fund and allocate towards grant-making (Mathias and Victurine, 2012).

The majority of CTFs have been established in Latin America and the Caribbean, with some in Africa and Asia, with funds ranging in scale from US$1.3-120 million, reflecting CTFs that manage single projects through to large funds like FMCN in Mexico that manage a number of funds for different projects or regions. CTFs in the blue economy play a vital role in building financial sustainability, advancing innovative economic incentives such as Payments for Ecosystem Services (PES) and strengthening collaboration between public and private sectors by serving as an intermediary institution (Bladon et al, 2014). They typically require a long-term commitment of 10-15 years from the activities they finance (Mathias and Victurine, 2012). Given their necessary alignment of multiple actors, CTFs feature a number of essential pre- and co-requisites, notably high political willingness among key government actors to enable funding for conservation projects, solid monitoring and reporting mechanisms and a sound legal framework for a CTF to be established and operate effectively. CTFs are often structured as a trust, wherein a trustee legally owns and manages donated resources (Bladon et al, 2014). In jurisdictions where trust structures are not possible, philanthropic foundations and civil associations may be adapted to play a similar role to a CTF.

CTFs are well suited to financing projects that can't easily generate revenue but are of significant conservation importance. Broadening these activities to provide financing for further marine habitats, ecosystems and protected areas is a clear opportunity for further CTF-based financing.

However, as mentioned above, some jurisdictions don't allow for trust funds and in these geographies a focus on building the prerequisites to enable the use of CTFs for conservation may be a valuable first step.

The schematic below presents an representation of a CTF endowment fund. A CTF sinking fund operates under similar approach, but the CTF fund, as well as returns generated from investments, itself is also allocated to projects. Note: Sinking funds typically expire after a certain amount of time.



Further reading
The Conservation Finance Alliance has developed useful practice standards (https://tinyurl.com/ruccgrz) for CTFs as well as a wide variety of other guidance detailing their operations. UNDP also features a helpful overview (https://tinyurl.com/umqa5ls) of environmental trust funds.

Carbon credit schemes

Carbon credits are financial assets, generated when activities take place that seek to remove carbon dioxide emissions or greenhouse gases from the atmosphere through practices that sequester them, or lower their levels of emission. One carbon credit equates to one tonne of carbon dioxide or carbon dioxide equivalent. Blue carbon (BC), a relatively new term, relates to carbon sequestered by coastal ecosystems – namely mangroves, sea grasses and salt marshes. Carbon markets, where credits are traded, present a potentially large marketplace, with accompanying economic incentive, through which coastal ecosystems may receive investment for their restoration, conservation and enhanced BC sequestration capacity.

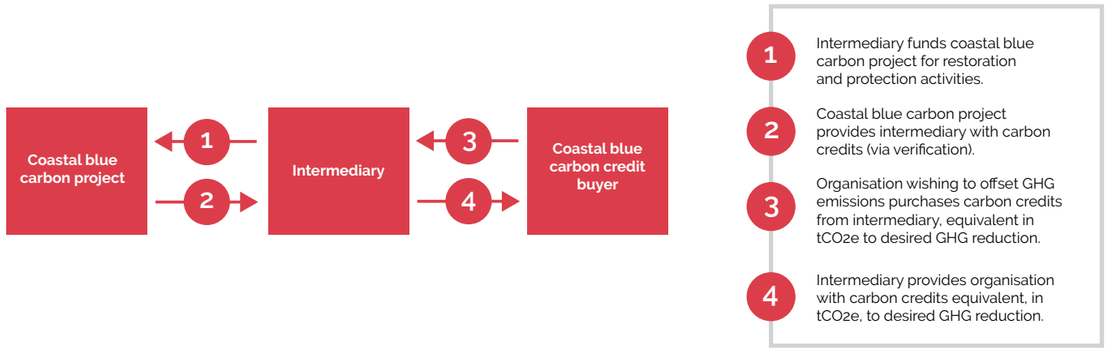
- **Scale:** Moderate
- **Expected returns:** N/A
- **Risk tolerance:** High
- **Providers:** Government agencies; project operators; private investors.
- **Suited to:** Payments for Ecosystem Services; CSR Investment
- **Key Examples:** Blue Carbon Resilience Credit (BCRC) (www.climatefinancelab.org/project/blue-carbon-resilience-credit); SeaGrass Grow; Association for Coastal Ecosystem Services (www.aces-org.co.uk)

Offset markets are well-evolved mechanisms to support the transfer of offset credits, that trade to represent comparative restoration of environmental damage carried out by another party. In the context of ocean-based carbon crediting, offset markets provide a framework through which private investment can support ecosystem restoration, conservation and protection – by placing a price on the cost of carbon sequestered. Mangroves, salt marshes and seagrass meadows are found on every continent, with the exception of Antarctica, and have exceptional capacity to sequester carbon dioxide. Consequently, they potentially offer a major source of finance for the sustainable ocean economy.

However, at present, BC offsets occupy a niche corner in the wider carbon marketplace. Compliance markets (prescribed by Kyoto Protocol ratification or the European Union Emissions Trading Scheme for example), are overly burdensome, administratively demanding and costly for most BC projects at present. BC credits are therefore found more often in voluntary carbon markets, where more flexibility is offered. As a result, blue carbon credits represent a niche offering in the space at present, and are most suitable for voluntary carbon offsetting in relation and aligned with desired corporate social responsibility (CSR) outcomes (Vanderklift et al., 2019). In order to boost their demand in their market, there is a need for BC projects to market their extensive co-benefits to distinguish themselves from other offset products. Further, pooling of offsets could be used to bundle BC offsets to minimise risk (Herr et al., 2018).

Pre- and co-requisites that require development to scale blue carbon credits include: standardised and robust calculation methods for blue carbon offsets and co-benefits, clarity on financial returns, better understanding of the types and magnitudes of risks, research and guidance on best practices, and improved government policy and legal frameworks (Vanderklift et al., 2019).

Owing to awareness of the potential role BC ecosystems could play in climate mitigation, there has been significant interest in the space, with numerous initiatives launched. As science, awareness and understanding develops, and demand for carbon offset credits grows, we are likely to see this market develop correspondingly. Credit pooling is one method that could be explored to de-risk BC offset credits.



Further reading

The Blue Carbon Initiative provides numerous resources (www.thebluecarboninitiative.org); and Climate Focus provide a useful overview of coastal blue carbon, carbon markets, and the Paris Agreement (https://climatefocus.com/sites/default/files/20181203_Article%206%20and%20Coastal%20Blue%20Carbon.pdf).

Debt swaps

Often refered to as 'debt-for-nature swaps', these are voluntary financial transactions where a country's foreign debt obligations are exchanged or forgiven for investment in, and commitment to, protection of nature. As transactions, they rely on the willingness of the debt's creditor to forgive the monetary value of the debt, at least in part. They thus relieve a country of debt burden, whilst enabling increased financial flow towards conservation.

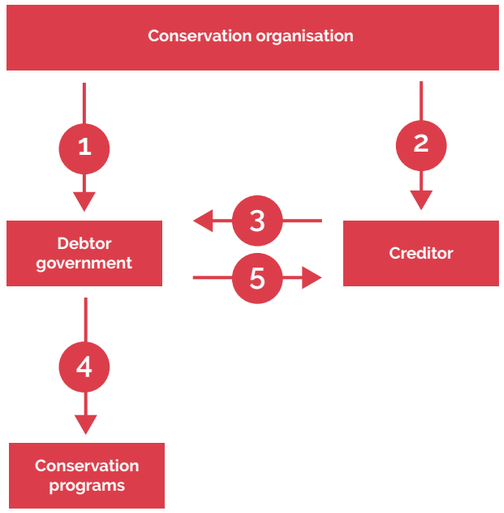
- **Scale:** Moderate to large (can result in large financial contributions to conservation activities)
- **Expected returns:** Low
- **Risk tolerance:** Low
- **Providers:** National governments; commercial banks; NGOs
- **Suited to:** Wild caught fisheries; Marine Spatial Planning
- **Key Examples:** Seychelles Debt Conversion (https://tinyurl.com/wxlyvj6)

Debt swaps are not novel financial mechanisms in and of themselves – they have been used in biodiversity financing, such as forestry conservation, for some time. Further, there have been examples of them being utilised for projects to finance social initiatives. In many of these applications, they have been shown to return financial benefit in excess of the written-off debt's value. However, their application to the blue economy is gaining interest owing to a recent, high-profile debt swap undertaken by the Seychelles.

Typically, owing to the nature of bilateral debt, debt swaps take place between a developed country (the creditor) and a developing country (the debtor). This is termed a public or bilateral swap. Creditors can also include commercial banks, in which case swaps are known as commercial swaps. Due to the nature of debt swap transactions, they are most applicable to developing countries. Often, an intermediary (a donor) – usually a conservation organisation – can act to contribute to purchase (at a discounted rate) and structure the debt, and support the set up of institutions (usually in the form of trust funds) that manage proceeds and invest in localised conservation projects. In the Seychelles, the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) was established to manage the conversion as well as the proceeds of the separate blue bond deal.

In order for a debt swap to successfully take place, there is a need for political willingness from the crediting country to recognise the value of conservation outcomes. Within the jurisdiction of the debtor, there is the need for supportive environmental policies. There is also the requirement for debtor countries to have sufficient technical and implementation capacity. Debt swaps are of benefit to debtor countries, with them reducing their debt and repayment burden. They can also serve to display confidence in the country, leading to further investment from a diversity of sources. For donors, they represent attractive investments due to their, usually, relatively high leverage ratios. For creditors, debt swaps hold attraction as it is considered that their benefits outweigh the possible uncertainty of future repayment.

Debt swaps have the potential to mobilise significant financial resource for conservation benefit. An analysis of multiple Small Island Developing States (SIDS) found that US$2 billion of potentially transferable debt could be applicable for use through debt swaps (Deutz, Kellett and Zoltani, 2018). Further, there are likely possible applications for use in coastal areas of developing countries.



1. Conservation organisation secures willingness by debtor government to direct governments funds to conservation programming on the basis of releasing capital through more favourable lending from creditors.
2. Conservation organisation approaches creditor to re-issue lending (refinance) to debtor at more favourable rates in exchange for savings to be used to drive conservation outcomes ('swapping' the debt).
3. Creditor refinances debtor obligations under more favourable conditions, releasing a proportion of debtor capital earmarked for conservation.
4. Debtor disburses newly-released funds for investment in conservation.
5. Debtor repays creditor under existing debt obligations with more favourable conditions.

Further reading

The UNDP provide helpful overview (www.undp.org/content/dam/sdfinance/doc/Debt%20for%20Nature%20Swaps%20_%20UNDP.pdf). The Convention on Biological Diversity also have drafted a training guide (www.cbd.int/doc/nbsap/finance/Guide_Debt_Nov2001.pdf). Convergence, NatureVest and The Nature Conservancy provide a helpful case study of the Seychelles debt swap (https://iwlearn.net/resolveuid/2f9af46e-aefb-45b6-bc68-b1e141d609bd).

Summary and key messages

It is clear from the literature supporting this document that the scope of investment models available for a sustainable blue economy is broad; nevertheless, available financing and the scale of investment continues to lag behind its terrestrial counterpart, largely as a result of missing prerequisites (notably in political willingness and financial literacy), as well as the nascent status of the sustainable blue economy and more generalised challenges related to finance in the developing world, where many of the emerging blue economy sector opportunities lie. As clearer governance frameworks and technological innovations for investing in sustainability emerge, and financial literacy and business planning capacity builds, many of the existing hurdles facing investment in the sustainable blue economy may be overcome.

In researching this paper, 5 key messages regarding the current state of financing for a sustainable blue economy emerged:

1. **We all need to speak the same blue economy language.** Use of the right language is key to the successful development of investment for the blue economy; bonds, loans, and equity have specific meaning and must be used in the right context to build understanding and investor engagement. This may require capacity building within the conservation sphere to develop finance 'fluency'.

2. **Political willingness will be a bedrock to progress in ocean finance.** Many prerequisites for successful financing exist, but the most significant to have in place include political willingness to innovate and build governance around investment, as well as financial literacy, and the ability to plan business growth for project pipeline.

3. **The financial system is yet to realise the full extent of sustainable blue economy opportunities.** Even with the existing availability of investment models for the blue economy, the scale of investment in sustainability is low and remains dominated by philanthropy (US$ 8.3 billion) and official development assistance (US$ 5 billion), particularly in emerging sectors. This is in line with recent studies that suggest that Goal 14 of the Sustainable Development Goals on 'life below water' has received the least amount of investment out of all Goals, suggesting that the financial system continues to struggle to recognise and value the capital and services provided by, and dependent on, the ocean.

4. **Significant opportunities exist for private investment in emerging sectors of the blue economy.** Correspondingly, significant opportunities for private investment exist in emerging sectors of the blue economy in the realm of impact investing and venture capital; scale and risk tolerance make larger-scale investment (such as blue bonds) the exception, rather than the rule. Redirecting existing capital flows towards sustainable practice and incorporating sustainability considerations into mainstream finance are particularly relevant for the established sectors of the blue economy.

5. **More transparency in existing capital investment is needed to gain a clear picture of the blue economy as it stands.** Capital flows, notably private capital, are often not disclosed voluntarily and when they are they tend not to be disaggregated along blue economy lines; this remains a significant impediment to clarifying the current state of blue economy financing and provides an area for significant further work.

The 2030 Sustainable Development Agenda provides a clear framework outlining the need for greater investment, and through this document, the Friends of Ocean Action hope to have demonstrated the landscape of ocean finance and provided clarity on what opportunities might be available to increase investment across the sectors of the sustainable blue economy.

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Annex 1

About the heat map

Due to the challenges in finding sufficient data regarding investment in the blue economy, there are limits to the possibilities to create graphics outlining capital flows or investment frequency into different sectors of the blue economy. Nevertheless, it was important to be able to demonstrate the theoretical fit between different instruments (investment models) and sectors in order to underscore the narrative of this paper, which aims to build understanding of the different types of capital and investment and how suitable these may be to different sectors of the blue economy.

In light of this, a subjective, indicative proxy approach was adopted to illustrate these relationships despite the data limitations. To do this, three key variables were identified as important drivers of investment decisions at both the project and investor level – scale, risk and return. A 1-6 scale was developed for each of these variables (where 1 is the lowest and 6 the highest score) and applied subjectively to both the investment models and example investments (both hypothetical and real) across the sectors of the blue economy featured in this report. The three variables were given matching scales in order to make combining the information to derive average values easier to accomplish. The scales, and their application, look as follows:

SCALE THRESHOLDS (IN US$)		RISK/TOLERANCE THRESHOLDS		RETURN POTENTIAL THRESHOLDS	
<50k	1	Very low	1	Low (<2%)	1
50k-500k	2	Low	2	Conservative (2-6%)	2
500k-1m	3	Medium	3	Average (6-10%)	3
1m-10m	4	High	4	Above average (10-15%)	4
10m-100m	5	Very high	5	High (15-20%)	5
>100m	6	Extremely high	6	Very high (>20%)	6

BLUE ECONOMY SECTOR		Project Scale (1 to 6)	Risk (1 to 6)	Return potential (1 to 6)
Natural capital	Conservation through PES	2	5	1
	Natural infrastructure	5	3	2
Commodities	Fisheries, industrial	5	2	4
	Fisheries, small-scale	3	5	2
	Aquaculture	4	3	4
	Bioprospecting	4	4	6
	Carbon sequestration	2	5	1
Marine and coastal development	Nature-based infrastructure	5	3	1
	Ecotourism	4	3	4
	Shipping	6	2	4
	Wind	6	1	4
	Tidal	3	3	3
	Wave	4	4	3
	Floating solar	2	4	3
	Waste management	4	4	5

INVESTMENT MODEL	SCALE (1-6)	RISK (1-6)	RETURN (1-6)
Microfinance loan	1	6	6
Seed financing	2.5	5	6
Crowd investment	2.5	4	4
Impact investment	4	4	3
Revolving loan funds	3	4	1
Conservation Trust Funds	3	4	2
Carbon credit schemes	3	3	4
CSR investment	2	4	1
Bank loans, small	3	2	2
Conservation Impact Bonds	5	3	3
Debt swaps	6	2	1
Project bonds	6	1	2
Bank loans, big	5	1.5	2.5
Grant	2	6	1
Sovereign bond	6	0.5	1.5

Based on these numbers, the fit between each investment model and blue economy sector was determined by determining the difference in value for the score across each variable. For example, for a microfinance loan and industrial fisheries, the difference between the scores was (4) for scale, (3) for risk and (3) for return. In principle, the smaller the difference between the scores the better the suitability of the investment model to the sector.

Each of the variables produced a heat map in their own right for the 'goodness of fit' for that one variable.

The fit numbers for each of these variables were then averaged (mean) to derive the figures used in the heat maps presented in the paper.

Annex 2

Glossary of terms

Term	Meaning
Accelerator	An accelerator, sometimes referred to as a start-up accelerator, is a vehicle for start-ups and very early-stage projects to be grown rapidly from 'seed' to early-stage investment rounds, accelerating a project's trajectory along the investment cycle. Accelerators are often run as a part of an investment fund focused on seed investments, and include mentoring and networking in addition to early-stage investment over a fixed time period.
Asset	A resource, owned by an individual or company, with market value. Assets can be tangible or intangible, but it must be possible for them to be exchanged for cash (though cash itself is also an asset). The exchange of ownership of assets is a central feature of finance.
Asset manager	In finance, an asset manager (sometime called an investment manager) is a type of entity responsible for managing the assets of an investor (or, more likely, multiple investors) - typically cash, debt obligations (loans and bonds) or shares. The objective of an asset manager is to manage the wealth of their investors, and they have a responsibility (referred to as fiduciary responsibility) to act in the best interests of their investors.
Capital stack	The blend of capital applied to a deal, with different types of money layered on top of each other playing different roles, from junior to senior. A capital stack is relevant in the context of risk and default, essentially adjusting the risk of an investment project by ensuring senior investors (starting with debt, then mezzanine, then equity) are paid out first and receive the greatest protection of their capital in the event of a default. Having a blended capital stack, notably one with a guarantee facility, significantly reduces the risk associated with an investment.
Credit rating	A credit rating is the evaluation of the credit risk of a borrower or debtor. It is a tool to assess the likelihood that a loan will be repaid, often graded against an alphabet scale. Notable credit rating agencies, such as Standard & Poors and Moody's, provide credit ratings for corporations as well as countries, indicating their creditworthiness and the market's confidence in their ability to pay back their creditors.
Ecosystem service accounting	Ecosystem service accounting is the valuation of services provided by natural ecosystems to the economy and society, and the practice of incorporating these values into existing accounting practices, notably by governments. This is a valuable tool in factoring the role of nature into society.
Ecosystem services	Beyond the physical, traded commodities that the ocean provides to the global economy, it generates a wave of less tangible direct and indirect benefits. These benefits are collectively termed ecosystem services, and can be provided at both global and local scales. They include the ecological basis for goods provided (termed provisioning services), such as fish, marine genetic material and other raw materials (covered in the commodities section below); regulating services, which for marine and coastal ecosystems include climate regulation, pollution control and natural hazard protection, and cultural services, wherein marine and coastal habitats hold important cultural value, offering aesthetic, religious, and emotional significance.
Externalities	Externalities, a key type of market failure, are factors influencing a project, development or investment that are not taken into consideration in planning an activity or in describing its economics. In the context of sustainability, externalities are the services provided by ecosystems, and/or the impact of development on ecosystems, that are not 'priced in' to a project from the outset. A classic example is the emission of greenhouse gases which, in the absence of regulation, is an externality in, for example, the development of a coal-fired power plant.
First-loss capital	First-loss capital is a type of guarantee in an investment deal, and often included as part of a capital stack to reduce the risk of investing. First-loss capital is typically grant or highly concessional development finance, allocated to take the first financial hit in the event of default, protecting the other investors in a capital stack from losing their money. First-loss capital is invaluable in developing new sectors and financing less commercially attractive prospects as it significantly reduces the risk of investment.
Guarantee	A guarantee (more accurately a financial guarantee) is a contracted promise that one party (the guarantor) will fulfil the obligations of a second party (the borrower) to a third party (the lender) in the event that the borrower is unable to meet their obligation. A guarantee is thus a valuable instrument for insurance for the lender to ensure that their capital will be recovered in the event of default, reducing the risk of investment.
GVA	GVA is an economic productivity metric that measures the contribution of a corporate subsidiary, company or municipality to an economy, producer, sector or region. Gross value added provides a dollar value for the amount of goods and services that have been produced in a country, minus the cost of all inputs and raw materials.
Incubator	An incubator is a platform that helps individuals and groups develop new ideas and innovations by providing mentoring, networking and often a physical space from which to work. Unlike an accelerator, incubators don't typically work to a fixed timeline, and while they may sometimes charge a fee for their services they do not make an investment into the start-up itself. As such, the entities offering incubators vary from businesses to academic institutions and government-backed platforms to venture capitalists and other investors.
Investment fund	An investment fund is a legal entity for investment, where multiple investors put their money into the fund on the basis that the fund will make investments that align with its investors priorities and return expectations. Investment funds may be impact-oriented, but all expect to generate a return on investment. In this, they are distinct from philanthropic funds.
Marine Protected Area	A marine protected area is a spatially designated place in the marine environment receiving a degree of protection from human activity for conservation purposes. Marine protected areas range in level of protection, with some offering partial exclusion of e.g. tourist entry, development or fishing activity. The most rigorous protected areas, often referred to as marine reserves, strictly prohibit any resource extraction from within the area.
Maximum Sustainable Yield	Maximum sustainable yield (MSY) is a bioeconomic concept in fisheries where the level of exploitation of the fishery has reduced the fish population to the point where the growth rate of the population is maximised, allowing for indefinite extraction of fish from the population at the highest possible point before the population would begin to decline. As a theoretical concept, MSY is difficult to pinpoint in the real world, and is therefore often treated as a limit rather than a target for sustainable fisheries management.

Mezzanine finance

Mezzanine finance is the description for a hybrid debt-equity instrument within a 'stack' of capital that bridges the gap between debt and equity. Mezzanine finance is broadly structured like debt but performs more like equity. It is more risk-tolerant and therefore easier to acquire than traditional debt, but carries higher interest rates and in the event of default can be converted to an equity share in the investment, offering some loss protection to the investor.

Multilateral organisation

A multilateral organisation is an intergovernmental entity that seeks to pool public resources from its member states to fund development projects. The best-known multilateral organisation is the United Nations and its multiple organisations and agencies, each with specific development objectives. Others, such as the Global Environment Facility (GEF) and Global Climate Fund (GCF) may serve specific objectives such as low-carbon development or conservation. Multilateral development banks (MDBs) are a form of multilateral organisation specifically focused on lending for poverty alleviation and development.

Parametric insurance

Insurance policies with a pre-agreed payment, guaranteed upon the occurrence of a triggering event.

Philanthropic fund

A philanthropic fund is a non-profit asset manager that disburses grants or zero interest loans towards projects and activities that meet the objectives of the fund (typically a collection of social and/or environmental objectives). Philanthropic funds do not carry an expectation of financial return, but they do expect to create impact.

Project developer

A project developer is an actor who has identified a business opportunity, and is seeking capital (often from multiple sources) to develop the opportunity. Typically, project developers are entrepreneurs with experience developing projects and attracting investment, however in the blue economy these types of individuals are often lacking, and civil society is increasingly playing this role, though often with less experience in finance and building businesses.

Return

In finance, return is the money made on an investment, described as a percentage value of the initial investment. For example, a 6% return on investment (ROI) for a project receiving an initial investment of US$500,000 will net the investor (0.06x500,000)= US$30,000

Risk

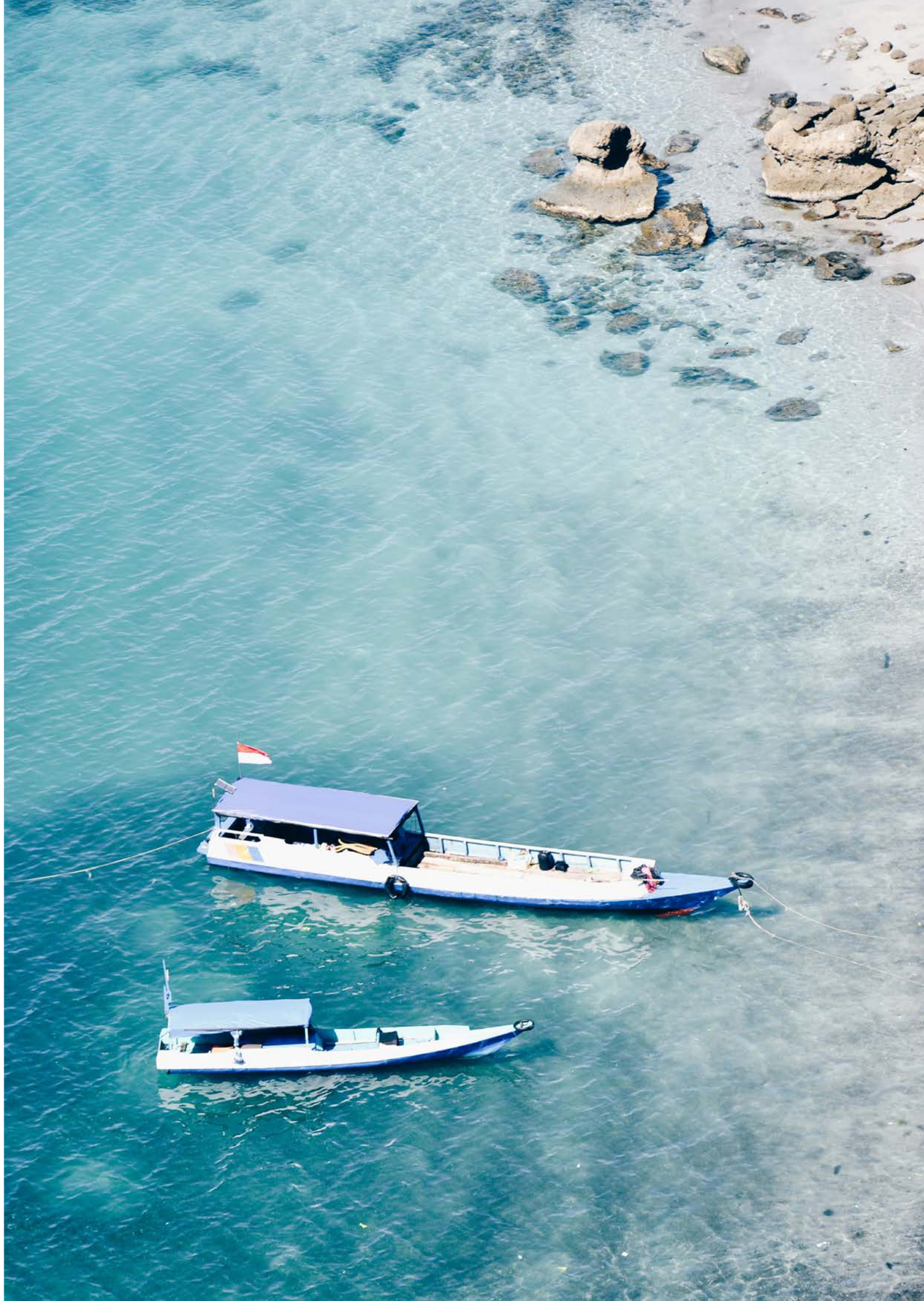
Ultimately, risk is a term for the probability that an investment will not generate the expected return, or in the worst case scenario, not even recoup the value of the upfront investment. It is a primary driver of how investors operate. Risk comes from many sources and is split into several categories - notably credit risk, project risk, currency risk and, in more recent years, external factors like climate risk are featuring more prominently in investor decision-making.

Risk-adjusted return

Different investors have different expectations for how much of a return they want to see in their investments, and how much risk they are willing to accept to see those returns. Risk-adjusted return is a valuable figure for investors that measures how much risk a project has absorbed relative to how much return it has generated. The risk-adjusted return on an investment is a key figure for investors to make investment decisions.

Securitisation

Securitisation refers to the pooling of various types of asset which on their own are not readily attractive for investment. When packaged together, they become considered more secure - hence securitisation - and investable. Typically, this is done to raise capital through the selling of securitised assets to other investors.



Acknowledgements

This paper was prepared by Ocean Fox Advisory and the Friends of Ocean Action Secretariat on behalf of Friends of Ocean Action.

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This paper would not have been possible without the extensive insight, reviews and feedback provided throughout its preparation, notably by the paper's Advisory Board members: Margaret Kuhlow (WWF), Torsten Thiele (Global Ocean Trust), Cherie Nursalim (GITI Group), Robert Bradley (Benioff Ocean Initiative), Leah Karrer (Global Environment Facility), P.S. Srinivas (New Development Bank), Alex Kennedy (Standard Chartered). Special thanks must also go to Adrien Vincent (SYSTEMIQ).

Experts consulted

Additional thanks must also go to an extended group of individuals who provided invaluable guidance and support: Rupert Howes (Marine Stewardship Council), Mari Pangestu, Diana Guzman (World Economic Forum), Katherine Stodulka (SYSTEMIQ), Dilette Giulani (SYSTEMIQ), Mark Way (The Nature Conservancy), Maren Hjorth (Katapult Ocean), Dorothée Herr (IUCN), Jurgen Zeitlberger (IUCN), Jan Yoshioka (Conservation International), Agustin Silvani (Conservation International), April Crow (Circulate Capital) and Daniel Hanna (Standard Chartered).

Friends of Ocean Action Secretariat

Thanks must also go to the wider Friends of Ocean Action Secretariat for their strategic guidance: Gaia Felber (World Economic Forum), Silvia Guzzini (World Economic Forum), Gemma Parkes (World Economic Forum), Ting Peng (World Economic Forum), Kristian Teleki (World Resources Institute), Sophie Wood (World Resources Institute), Ben Hart (World Resources Institute).

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Notes

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