Towards a regenerative Blue Economy

Mapping the Blue Economy

Raphaëla le Gouvello and François Simard

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Foreword

In light of the triple planetary crisis and the challenges our ocean faces from pollution, overfishing, habitat destruction and climate change, we find ourselves in need of more than just sustainability – we need regeneration.

The ocean provides critical ecosystem services indispensable to life on Earth. But the ocean and its vital contributions to society are in peril. Annually, 9-14 metric tons of plastic pollution flows into the ocean; one third of global fish stocks are overfished; 50% of mangroves and 30% of wetlands and seagrasses have been degraded or lost; and at 2 degrees C of warming, 99% of corals could be lost.

The good news is that the ocean also offers regenerative solutions to many of the crises that we face today. The concept of a "regenerative blue economy" has emerged, prioritising both restoration and protection while actively seeking economic prosperity.

We therefore need to urgently recalibrate our efforts towards unlocking a regenerative blue economy that prioritises restoration and protection of the natural resources and ecosystems that enable people to thrive. This means leveraging resources to create knowledge, technical assistance and return on investments in a people-sensitive blue economy.

To bring this vision to fruition, we need to foster a collaborative approach among all stakeholders, including governments, the conservation sector, economic sectors, and Indigenous peoples and local communities. Each sector has a responsibility and a crucial role to play in transforming our approach to ocean conservation and socioeconomic growth, and embracing the development of a climate-resilient, nature-positive, and people-oriented inclusive blue economy. The African-born Great Blue Wall initiative is a testament to such collaboration for a regenerative blue economy.

This new IUCN report, Towards a Regenerative Blue Economy - Mapping the Blue Economy, seeks to map the evolution of the blue economy concept and propose a definition and principles for all blue economy-related work through the lens of conservation and sustainable use across the globe. This will support the objective of IUCN's Programme, Nature 2030, and its targeted ocean ambition to ensure that decision-making and actions promoting the blue economy recognise the sustainable use of ocean resources and include the pathway towards a regenerative blue economy.

A regenerative blue economy relies on flourishing ocean ecosystems and biodiversity, but it also helps the ocean in turn to flourish. Let us breathe new life into our ocean.

Dr Grethel Aguilar
Director General
IUCN, International Union for Conservation of Nature

Foreword

Climate regulation, food security, innovation, economic transformation, trade, mobility, cultural connections, spiritual nourishment: the ocean is at the centre of our solution for development.

Yet, the ocean, the lifeblood of our Blue Planet, has long been taken for granted, exploited beyond its limits. It is imperative, now more than ever, that we restore our relationship with our ocean this unique and wonderful resource. The time has come to embrace a regenerative Blue Economy, one that heals and restores our ocean while fostering development, social inclusion, equity and empowering coastal communities to be its natural stewards.

Regeneration goes beyond sustainability; it involves restoring and revitalising our resources and the ocean's natural systems, placing at its heart principles of 'blue justice' and resilience. It celebrates the diversity of our cultures while elevating regenerative blue economic principles that have been inherent in the practices of traditional communities, the true artisans of the sea for centuries.

Progressing towards a regenerative blue economy is not just a choice but a necessity. It represents a fundamental shift from exploitation to conservation, to an ocean for now and for future generations.

The 'tropical majority', representing the world's most ocean-dependent and climate- vulnerable populations, is driving the development of a regenerative Blue Economy. Its unequivocal leadership was recently demonstrated by the Moroni Declaration and the Cape Town Manifesto, two powerful messages sent to the world from African shores. Both highlight the western Indian Ocean-derived Great Blue Wall initiative, a bold and visionary model pioneering the acceleration and upscaling of a regenerative blue economy along the east coast of Africa, and delivering nature, climate and people-positive transformative change.

By redirecting finance to regenerative activities, expanding a science and innovation base in the global south, empowering local stakeholders to deliver ocean action and above all by showing leadership in driving an ambitious ocean agenda, we can together look confidently towards a thriving blue future.

James Alix Michel
Former President of the Republic of Seychelles
& Chairman of the James Michel Foundation

Executive summary

Blue Economy has various definitions, depending on the interpretation and principles discussed. There is no consensus on how to define it nor how to describe its founding principles. In this context, and as part of the France-IUCN Partnership 2021–2024 and with the support of the French Development Cooperation (AFD), IUCN has developed a framework as a means of defining three types of a Blue Economy from the perspective of conservation and sustainable development:

i) A Blue Economy rooted in the 'maritime sector', also known as 'brown Blue Economy'

This definition includes the traditional activities of the 'maritime sector', which can be conflated with the 'Ocean Economy'. It is clearly anthropocentric and based on a conventional and neoclassical economic model that operates as 'business-as-usual' (BAU).

Since the end of the 20th century, high economic and social expectations (for future jobs) have been placed on Blue Growth to fuel a Blue Economy, with a view to creating a 'blue' GDP. The shape of a Blue Economy can thus vary widely: once a link with a marine (or aquatic) environment is established, there is no economic sector that could realistically be excluded, except for some cases involving the naval military sector.

Blue Economy is associated with traditional accounting that mostly consists of economic (micro and macroeconomic) and social (employment) profitability indicators, which are aggregates of the economic performance of various sectors.

ii) A sustainable Blue Economy

The year 2012 saw the progress of the term 'blue economy'. At the United Nations Conference on Sustainable Development (UNCSD),[1] Rio+20 Summit, Blue Economy was recognised as encompassing all economic activities in the maritime sector, provided that these were consistent with sustainable development. In 2015, the World Wildlife Fund for Nature (WWF) proposed a vision, definition, and guiding principles for a sustainable Blue Economy, which was more sustainable and inclusive than Blue Economy.

Other stakeholders are also adapting their own definition, scope, and various recommended tools relating to the Blue Economy to focus more on environmental (healthy ocean), social (inclusive and fair growth), and integrative (good governance) aspects. The activities to protect, repair, and restore marine and coastal ecosystems, as well as ecosystem services, are integrated into this approach.

In terms of assessment and key performance indicators (KPIs), sustainability indicators have been added to the traditional accounting of the Blue Economy. However, debate still remains and much research abound to assess the economic, environmental, and societal performances of the sustainable Blue Economy.

1 For more information, please see: https://wedocs.unep.org/20.500.11822/8117

iii) The regenerative Blue Economy

The demand for a new Blue Economy originated from a more profound pre-2012 claim by Pacific Island Countries. For them, the challenges of protecting and preserving the health of marine and coastal ecosystems and living marine resources are critical, as declared in 2009 by the IUCN Oceania Regional Office.

This vision goes beyond mere economic factors: it is integrative, inclusive, and regenerative. It advocates for a new economic model able to meet global and local challenges. As it evolves, the definition of a regenerative Blue Economy progresses towards an economy that becomes an 'actor' in the fight against climate change and biodiversity loss, and contributes positively to such issues, thereby becoming an 'Ocean-positive' economy.

In this vision of a Blue Economy, which has started to include the term 'regenerative' from 2020 onwards, certain activities are therefore excluded from its scope, either because they are considered incompatible with the carbon reduction objectives of the 2015 Paris Agreement, such as oil extraction, or are deemed too threatening for marine ecosystems, such as deep sea mining. Other sectors will have to change their practices to fall under the scope of the regenerative Blue Economy, such as fishing, aquaculture, and tourism. New activities around Blue Carbon can be part of this new regenerative Blue Economy from the outset, provided best practices – still to be defined – are used.

A regenerative Blue Economy is inclusive, advocates for 'blue justice', and is based on a participatory, transparent, and inclusive governance model at multiple levels. This model is based on the broad principles of the ecosystem approach, while respecting the rights of nations and coastal communities. In economic terms, a regenerative Blue Economy seeks robust sustainability and recognises the principle of non-substitution for natural capital as the basis, implying that the priority is the conservation of blue natural capital. New indicators, such as the Ocean Impact Navigator, have been proposed as a way to evaluate the positive impact of the regenerative Blue Economy on marine and coastal socio-ecological systems.

This report represents an important first step in mapping the evolution of Blue Economy concepts, proposing a definition and founding principles for all Blue Economy-related work, through the lens of conservation and sustainable development, in all regions across the globe (Box 1).

Box 1 — Definition and founding principles of Blue Economy

DEFINITION

A regenerative Blue Economy is an economic model that combines rigorous and effective regeneration and protection of the Ocean and marine and coastal ecosystems with sustainable, low, or no carbon economic activities, and fair prosperity for people and the planet, now and in the future.

FOUNDING PRINCIPLES

- The protection, restoration, resilience, and regeneration of marine and coastal ecosystems, marine resources, and natural capital are priorities. Combating climate change and biodiversity losses are included in this list. The precautionary principle is applied when the impacts of an activity on marine and coastal ecosystems are still poorly understood. The ecosystem approach must be applied.

- The economic system set up around regenerative Blue Economy must prioritise inclusion, fairness, and solidarity, guarantee the well-being and resilience of impacted populations, and reduce their vulnerability to climate change. It must be economically sustainable and supported by responsible sources of funding that subscribe to these same principles.

- Regenerative Blue Economy must have an inclusive and participatory governance system, with a transparent approach for reliable, scientifically grounded assessments. The system must be flexible, with ad hoc legal and regulatory instruments, and it must be integrated into international agreements and commitments on climate change and biodiversity conservation.

- Regenerative Blue Economy must have low or no carbon activities with a positive impact on the regeneration of marine and coastal ecosystems and the well-being of local populations. It must follow the principles of a sustainable circular economy by saving marine resources and minimising waste.

- Regenerative Blue Economy must be implemented as a priority in island States with specific requirements. It must take into account the needs of coastal populations, Indigenous peoples in particular, and recognise their traditions.

Sources: Authors, based on UNDP (2022), WWF (2015) (see also Appendices 1 and 2)

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Abbreviations and acronyms

ADB	Asian Development Bank
AFD	*Agence Française de Développement* (French Development Agency)
Barcelona Convention	Convention for the Protection of the Mediterranean Sea Against Pollution
BAU	Business-as-usual
BBNJ	Biodiversity Beyond National Jurisdiction
BEDF	Blue Economy Development Framework
BESF	Blue Economy Sustainability Framework
BEVT	Blue Economy Valuation Toolkit
BNCFF	Blue Natural Capital Financing Facility
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CBE	Center for the Blue Economy
CI	Conservation International
CSR	Corporate Social Responsibility
DEMF	*Données économiques maritimes francaises* (French Maritime Economic Data)
EEZ	Exclusive economic zone
EFESE	*Évaluation francaise des écosystèmes et des services écosystémiques* (French assessment of ecosystems and ecosystem services)
EIB	European Investment Bank
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross domestic product
GHG	Greenhouse gas
GBW	Great Blue Wall
ICZM	Integrated Coastal Zone Management
IFREMER	French Research Institute for the Exploitation of the Sea
IOM	Integrated ocean management
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Service
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
Kunming-Montreal GBF	Kunming-Montreal Global Biodiversity Framework
MFF	Mangroves for the Future
MPA	Marine Protected Area
MRE	Marine renewable energy
MSP	Marine spatial planning
NbS	Nature-based Solutions
NDC	Nationally Determined Contributions
NGO	Non-governmental organisation
Ocean Panel	High Level Ocean Panel for a Sustainable Ocean Economy

ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OIN	Ocean Impact Navigator
OSPAR Convention	Convention for the Protection of the Marine Environment of the North East Atlantic (also known as Oslo-Paris Convention)
SOP	Strategic orientation plan
PIC	Pacific Island Countries
PPP	Public-Private Partnership
SDG	Sustainable Development Goals
SDAO	Sustainable Development Analysis and Opinion
SEEA	System of Environmental and Economic Accounting
SeyCCAT	Seychelles Conservation and Climate Change Adaptation Trust
SIDS	Small Island Developing States
SSE	Social and solidarity economy
TNC	The Nature Conservancy
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNCSD	United Nations Conference on Sustainable Development
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP-FI	United Nations Environment Programme Finance Initiative
UN-ECA	United Nations Economic Commission for Africa
UNEN	United Nations Economists Network
UNFCCC	United Nations Framework Convention on Climate Change
UNGC	United Nations Global Compact
WCC	World Conservation Congress
WEF	World Economic Forum
WRI	World Resources Institute
WWF	Worldwide Fund for Nature

1 Introduction

The emergence of the concept of a 'blue economy', and its various interpretations by different stakeholders with different objectives, has led IUCN and AFD (French Development Agency) to set up the France-IUCN Partnership (2021–2024). The purpose of the partnership is to propose a definition and single interpretation of the Blue Economy, which is consistent with both the values and missions of the IUCN and AFD, and current initiatives such as the Nature-based Solutions (NbS) and the IUCN Global Standard for Nature-based Solutions™.

The work presented here takes stock of the various schools of thought and interpretations surrounding the Blue Economy and its implementation. It is supported by graphs and figures taken from various presentations.

The methodology used consisted of the following:

- A (non-exhaustive) review of literature from the international scientific community was performed, which included 'grey' literature and various major reports produced by international organisations, such as the OECD, United Nations (UN) agencies, the World Bank (WB), the Asian Development Bank (ADB), the High Level Ocean Panel for a Sustainable Ocean Economy (Ocean Panel), among others, as well as non-governmental organisations such as WWF and various coalitions.
- Identification of key aspects and issues.
- Based on the following guide questions, screen the various (non-scientific) documents according to their degree of relevance to the documents studied:
  - What is the context of the report and its general outline?
  - What definition of Blue Economy does the report refer to? What adjective is used, or what new name?
  - What are its guiding principles?
  - What does the Blue Economy include? What sectors are considered, and in what conditions?
  - How is it evaluated, and what performance indicators are used?
  - Who are the players and partners involved?
  - What are the priorities and actions?
  - Which regions, case studies, and how are these distributed?
  - How were the results of the case studies used and shared?

2 A brief narrative of Blue Economy

Several reports and scientific publications describe how the concept of Blue Economy came about. A brief historial overview was developed (Figure 1) on this basis, illustrating the key aspects ranging from the emergence of an economy linked to activities in and around the sea and the marine resources used by ancient civilisations (from ancient times, to centuries BC) up to the modern era (2020–2023), with forecasts for the future (2030–2050).

This historical overview was designed as a mental map exercise. It was the basis of the rest of this report, which is a first analysis, and shows a summary of the questions raised as the concept of Blue Economy developed. Two main currents of thought are clear in the overview:

1) The first current involves describing a marine economy perfectly in line with the traditional activities of the 'maritime sector', which continues today under the name of Blue Economy – a resolutely anthropocentric concept. It is based on the sum of the economic contributions of various sectors using a conventional, neo-classical economic model, as cited in various reports referring to the expression 'business-as-usual' (BAU).

2) The second current is more related to the concept of sustainable development, which has led to major international conferences and groundbreaking reports (such as the Meadows Report in 1972, also known as the Club of Rome Report), as well as the various major events that

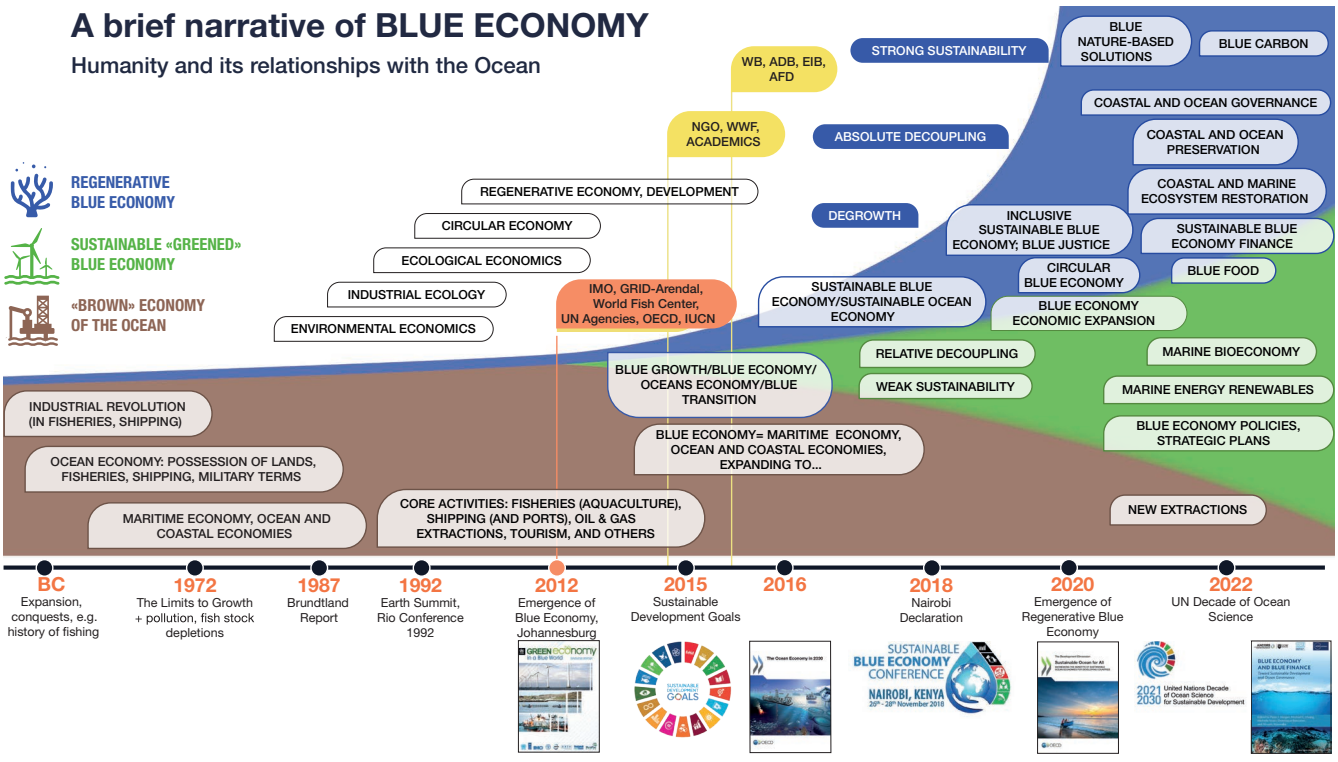


Figure 1 — A brief narrative of Blue Economy, its related concepts and key dates
Source: Authors

followed. Its defining essence involves understanding marine and coastal ecosystems, the essential role of the Ocean in how the planet functions, and the importance of the Ocean for coastal societies, particularly island States, which are intimately linked to the Ocean's health. Its origin can also be attributed to the lives of 'peoples of the sea', those whose ancestral customs and traditions revolved around the sea such as the Pacific Ocean peoples. It goes beyond mere economic factors: it is integrative, inclusive, even regenerative, and advocates for a new economic model that can meet local and global challenges. It is inspired by the most recent schools of thought, including the emergence of a 'regenerative economy'.

2.1 From a marine economy to a resolutely anthropocentric Blue Economy

Blue economy (defined as a 'brown blue economy' following the principles proposed by the G20 in February 2023)[2] is firmly inscribed in the concept of a marine economy, an 'Ocean Economy', written alongside human history, and the desire to expand coastal and marine territories. This economic system involves the use of marine resources (mainly fish), trade, territorial expansion in the name of military strategies and access to resources from distant places, particularly fishery resources, and the colonisation of new territories (Jackson et al., 2001).

Through this lens, the marine economy consists of the sum of traditional economic activities related to the sea, mainly shipbuilding, shipping, port activities, navies, fishing, and aquaculture.

Throughout history, and particularly during the 19th and 20th centuries, the marine economy followed the industrialisation curve of other human activities. Fishing has modernised to fish **more** and in equally **more** places, with **more** impact on fisheries resources and marine and coastal ecosystems. This was accompanied by new or expanded activities in mining, extraction of marine aggregates, and exploitation of marine oil fields, compounded by the various sectors of the maritime economy, thereby very significantly impacting marine ecosystems.

At the end of the 20th century (1970–2000), the development of coastal and marine tourism and all leisure activities related to the sea were aggregated with the sectors considered to be part of the marine economy. The coast became an attractive geographical area for a growing part of the world's population (Goussard & Ducrocq, 2017), creating a coastal economy that shared some sectors with the marine economy.

Interest in defining, qualifying, and measuring the marine economy dates back to the 1970s, in the United States (Pontecorvo et al., 1980). Several countries took up the topic a later (Colgan, 2003 & 2013; ECORYS, 2012 & 2014; Eurostat, 2009; Kildow & McIlgorm, 2010; Park, 2014a & 2014b; Surís-Regueiro et al., 2013; Zhao & Hynes, 2013; Zhao et al., 2014). Only at this time did countries realise its relative weight in national economies (for example, island States) or in coastal regions, expressed as a percentage of gross domestic product (GDP). In France, the first report on the marine economy was published in the 1990s by the French National Institute for Ocean Science (IFREMER) (Kalaydjian & Bas, 2022). Since then, many countries have published national and international plans and proposed monitoring systems for marine economy. Because, as every player emphasises, the stakes are geostrategic, economic, and political.

2 The term 'brown economy' expressed in a draft G20 document of February 2023 has subsequently disappeared from G20 drafts. For more information on this topic, please see Choudhary et al. (2021) and *G20 High Level Principles on Sustainable and Climate Resilient Blue Economy. G20 Draft Position Paper, February 2023*.

This period also saw the emergence of new marine aquaculture with high added value, particularly salmon farming, various marine fish farming in Southern Europe and Asia, and shrimp farming in Asia and Latin America. These new sectors were integrated into the Blue Economy, creating a 'Blue Bioeconomy',[3] as defined by Europe, and there were high hopes for Blue Growth (ECORYS, 2012). The marine economy (at that time, Blue Economy was strictly synonymous with the 'Ocean Economy)' encompassed all these production activities in addition to coastal development and the marine renewable energy (MRE) sector. It gradually integrated service activities and non-market activities, including research, protection, and education/training, which justified the creation of a new American scientific journal, *The Journal of Ocean and Coastal Economics* (Colgan, 2014).

From the end of 20th century through to contemporary times, following a BAU model, high economic and social expectations (for future jobs) were placed on Blue Growth, as expressed by Europe (ECORYS, 2012; EIU, 2015). Such Blue Growth implied an understanding of a higly industrial marine economy, from traditional and emerging economic sectors, which added up to create a 'blue' GDP, expected to weigh more and more in national GDPs – a clear goal for many countries, including Europe, USA, and China (Wenhai et al., 2019). This objective was discussed at major world economic forums (including the World Economic Forum, WEF) and the Organisation for Economic Cooperation and Development (OECD).

However, **since 2012**, the tide has been turning. This was when the term 'blue economy' was used at the United Nations Conference on Sustainable Development (UNCSD), also known as Rio+20 (UNEP, 2012a; 2012b). Awareness of the impacts of human activities on ecosystems, including marine and coastal environments (overfishing, marine pollution), the Meadows Report (1972), the Brundtland Report (1987), as well as major international conferences (United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit or Rio Conference, the Convention on Biological Diversity (CBD) and other Conferences of the Parties (COPs) have all led to the concept of sustainable development, now included in national and international agendas. Violations of marine and coastal ecosystems due to human activities are also being recognised, leading to advocacy for legal and scientific instruments/tools specific to these marine and coastal ecosystems, such as Integrated Coastal Zone Management (ICZM), fishing management measures, major treaties and various conventions (such as the Convention for the Protection of the Marine Environment of the North East Atlantic, known as the OSPAR (Oslo-Paris) Convention, the Convention for the Protection of the Mediterranean Sea Against Pollution, known as the Barcelona Convention, and the United Nations Convention on the Law of the Sea (UNCLOS), etc.).

Following the emergence of the concept of sustainable development and all its applications, the Blue Economy, now recognised as comprising all marine economic activities, must also be included in sustainable development. In other words, each of the traditional and emerging maritime sectors must be made more sustainable, 'greener, bluer', and they must at least minimise their impacts on marine and coastal ecosystems to preserve resources (Golden et al., 2017). A good 'mutual understanding' also needs to be maintained between these sectors. Therefore, integrative political instruments, such as the European Directive on Marine Spatial Planning (MSP), are needed, with care taken to avoid 'blue grabbing' of marine resources (Barbesgaard, 2018; Bennett et al., 2015; Queffelec et al., 2021).

3 For more information on the definition of bioeconomy, European version, please see section 3.9.

By this approach, all traditional or emerging sectors of the marine economy are included in the Blue Economy. That is what Europe proposed in 2012.[4] With such interpretation of the Blue Economy, India can also be cited, as it considers deep-sea mining within its exclusive economic zone (EEZ) to represent a major opportunity for the development of a Blue Economy, which the Indian government deems sustainable (Wenhai et al., 2019). The African Union (AU) and the Asian Development Bank (ADB) share this view. However, it should be noted that since the Lisbon Conference in 2022, France opposes deep-sea mining,[5] as have several other States more recently.[6]

The Blue Economy is an economic system, blue because the sea is blue (Wenhai et al., 2019), which specifically encompasses human activities that are directly or indirectly related to the sea (as well as inland aquatic environments).[7] It must take inspiration from the 'Green Economy' as defined by the United Nations (UNEP, 2012a).

In this regard, according to some authors who are critical of the Green Economy, the model is **poorly sustainable** and associated with a **relative decoupling** (Loiseau et al., 2016). A poorly sustainable global project, similar to BAU, which is not associated with degrowth or a sober economy, does, however, seem to be an inadequate response to the major issues of climate change, biodiversity loss, and pollution, particularly for the Ocean and its ecosystems (D'Amato et al., 2017; GIEC, 2022; IPBES, 2019; Pörtner et al., 2019).

Criticism on both Green Economy and a broadly defined Blue Economy has emerged from the scientific community (Bennett et al., 2019; Voyer et al., 2018), non-governmental organisations (NGOs) and think tanks (EIU, 2015). This situation has prompted the European Commission, several United Nations agencies, the OECD, the World Bank, and several countries to understand the need to limit the potential scope of the Blue Economy to one of a 'sustainable blue economy' equivalent to the 'sustainable Ocean Economy', which may only include human activities recognised as being truly 'sustainable'.

For Europe (European Commission, 2021a), Blue Economy means that all economic sectors and non-market activities linked to the sea must be practiced sustainably. This point is extensively described in the European Commission report (European Commission, 2021a & 2021b), which defines sustainability criteria for a sector or territory as part of the Blue Economy. In the same vein, developments by the OECD between 2016 and 2021 (OECD, 2016; 2022), UN agencies (Davies & Vauzelle, 2023; UNDP, 2023), and the World Bank (World Bank & UN DESA, 2017) may also be included. Furthermore, AFD defined an 'Ocean' strategy in 2019 (AFD, 2019).[8] It should be noted that the proximity of these funding and international cooperation institutions with emerging countries, particularly Small Island Developing States (SIDS), is pushing them towards a more demanding Blue Economy model, closer to the second current that will be described later in this report.

4 According to the European Commission, "the blue economy encompasses all sectoral and cross-sectoral economic activities related to the oceans, seas and coasts". "It includes emerging sectors and economic values based on natural capital and non-market goods and services through the conservation of marine habitats and ecosystem services." (European Commission, 2021a, p. 16; 2021b, p. 12).

5 For more information, please see: https://www.diplomatie.gouv.fr/en/french-foreign-policy/climate-and-environment/news/article/international-seabed-authority-council-france-calls-for-expanding-the-coalition

6 For more information on the 28th session of the Assembly of the International Seabed Authority (ISA) in July 2023, please see: https://www.isa.org.jm/news/isa-assembly-concludes-twenty-eighth-session-with-participation-of-heads-of-states-and-governments-and-high-level-representatives-and-adoption-of-decisions-on-the-establishment-of-the-interim-director/

7 For many entities (UNECA, African Union, Ifremer), Blue Economy comprises activities in freshwater aquatic environments, such as lakes, ponds, including inland fishing and aquaculture.

8 For more information, please see: https://www.afd.fr/fr/ressources/strategie-trois-oceans

This interpretation of a Blue Economy, evolving to a sustainable Blue Economy, should not exclude any economic sector, provided that, where possible, a suitable impact assessment is carried out for each sector. The assessment is usually based on benchmarks that are mainly focused on quantifying environmental impacts, as well as a few social indicators. Therefore, Blue Economy and sustainable Blue Economy both provide good analytical frameworks, but still fall short of the objectives for a 'regenerative' Blue Economy.

This interpretation of the Blue Economy, which remains highly focused on developing 'business-oriented' economic activities with varying degrees of sustainability, remains widespread among many countries and economic players in Europe, the Americas, Asia, and Africa. Many legal and financial instruments to support and promote the development of sustainable Blue Economy have resulted from this.

The Blue Economy that became the sustainable Blue Economy offers a tremendous opportunity for new growth. This vision is a user and consumer of marine resources, which constitute a capital that must be managed well to create a viable Blue Economy.

2.2 Emergence of a 'new blue economy': sustainable, inclusive, regenerative, and resilient

The new awareness of damage to the marine and coastal environments in the 1970s, the first warning signs of overfishing, major marine pollution, and the extent of land-based pollution affecting marine and coastal ecosystems, are all fundamental reasons for why a new approach to maritime activities was developed.

Similarly, the gradual realisation of the effects of climate change, particularly on marine and coastal ecosystems and coastal populations, the understanding that plastic pollution can contaminate all marine waters and their living organisms, and the recognition of the essential roles played by marine and coastal ecosystems in the global challenges of climate change and biodiversity (GIEC, 2022; IPBES, 2019; Pörtner et al., 2019), **have all clearly contributed to the need for a different view of the marine economy, which moves away from BAU and prioritises the health of marine and coastal ecosystems.**

In this setting, 2012, the year in which the concept of the Blue Economy emerged, was also the year of the UNCSD Rio+20 (UNEP, 2012a), as well as other United Nations meetings (Vierros, 2021), where the need to talk about the features of a Blue Economy comprised within the Green Economy was supported by a coalition of players through speeches by the United Nations, island States, NGOs and other intergovernmental players, including the IUCN (Keen et al., 2018).[9]

However, this demand for a new Blue Economy originated from an earlier and more profound claim made by the Pacific Island Countries (PICs). For these countries, preserving and protecting the health of marine and coastal ecosystems and living marine resources is crucial. Blue Economy must be inclusive, supportive, and focused on coastal communities. This vision is supported by the IUCN through its Fiji-based regional office for Oceania, and was expressed as early as 2009. The SIDS' 'ownership' of the need for an 'authentic' Blue Economy is also recognised by African States in their 'Blue Economy'

9 In Keen et al. (2018), PICs express a clear vision of the blue economy: "The Blue Economy refers to the sustainable management of ocean resources to support livelihoods, more equitable benefit-sharing, and ecosystem resilience in the face of climate change, destructive fishing practices, and pressures from sources external to the fisheries sector."

handbook, published by the United Nations (UNECA, 2016).[10]

It is because of the vital and unwavering connection between Indigenous island communities and the sea and its resources that this vision of the Blue Economy can be said to be 'ancient', dating back to humankind's origins. Today, this same discourse is put forward by Indigenous peoples, as was recently shown in the film about the talks surrounding Biodiversity Beyond National Jurisdiction (BBNJ),[11] or 'High Seas Treaty'.[12]

In this interpretation of a new Blue Economy, as supported by alternative movements, NGOs, and part of the scientific community, the Blue Economy (Keen et al., 2018) is understood to be closer to the concept of Ecological Economics, which emerged in the 1990s (Costanza, 1989; Costanza & Daly, 1987a & 1987b), which was applied to marine and coastal socio-ecological systems. This vision was also held by the coastal socio-ecological system approach, linked to the work of Nobel Prize-winning economist E. Ostrom (Ostrom, 2009).

In this respect, the important work of the World Wildlife Fund (WWF) in bringing this vision of a different, more demanding Blue Economy must be acknowledged. Their work provided the first definition and the principles of a sustainable Blue Economy,[13] that is more sustainable and inclusive, along with the publication of *Reviving the ocean economy* report (Hoegh-Guldberg, 2015). Various UN agencies, particularly UN DESA, UNDP, UNEP, OECD, and the World Bank, are also developing the definitions and scope of and various recommended tools for the Blue Economy, emphasising the environmental (a healthy ocean), social (inclusive and fair growth), and integrative (good governance) dimensions in the development of a sustainable or even 'regenerative' Blue Economy (UN DESA, 2014). The inclusion of the Sustainable Development Goals (SDGs) in 2015 was essential, especially SDG 14 on oceans and aquatic ecosystems. SDG 14 was also integrated as a key component of the sustainable Blue Economy concept by the World Bank and the United Nations (World Bank & UN DESA, 2017). In spite of a multitude of definitions, the economic model itself is remains unaffected and still follows the trends that are similar to those described in Section 2.1.

It was perhaps at the start of the United Nations' Decade for Ocean Science for Sustainable Development (Ocean Decade, 2021–2030), the UN Ocean Conference in Lisbon in 2022,[14] and the negotiations for the Kunming-Montreal Global Biodiversity Framework (GBF), which saw the emergence of the concept 'nature positive', that a new trend was clearly formulated. It was a step towards a more demanding Blue Economy that is more restrictive with regard to the activities that can be promoted. Evidence from the various reports of the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) on serious damage to marine and coastal ecosystems, proven threats, and

10 "The blue economy concept grew out of the dissatisfaction of Small Island Developing States (SIDS) and coastal nations throughout the preparatory process for Rio +20. These countries sought to extend the green economy concept to be more applicable to their circumstances and stressed a focus on the "Blue Economy"." (UNECA, 2016, p. 32).

11 See also "Traditional knowledge and the High Seas Treaty", a film produced by the IUCN, Ocean Programme (Minna Epps, Executive Producer), shown at IMPAC 5, Vancouver, February 2023: https://youtu.be/FFo9ZsUZJSo

12 Intergovernmental conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction For further information, please see: https://daccess-ods.un.org/access.nsf/Get?OpenAgent&DS=a/conf.232/2023/4&Lang=E

13 https://wwf.panda.org/wwf_news/?247477/Principles%2Dfor%2Da%2DSustainable%2DBlue%2DEconomy

14 https://www.un.org/en/conferences/ocean2022

major climate change events affecting coastal territories has certainly contributed to the increased awareness by various major political, associative, and economic stakeholders. They realised that more needs to be done to support and enable a Blue Economy commensurate with these now extremely critical issues.

The vision of the sustainable Blue Economy is evolving: it must be an 'active player' in the fight against climate change and biodiversity losses. It must be able to play a **positive** role in these issues, and be 'Ocean positive', as advocated by AFD, by aligning with the Kunming-Montreal GBF objectives. Herein lies the paradigm shift: one that is heading towards a vision of a carbon-free **positive** Blue Economy (Lieberknecht, 2021; Lobmüller & UNEP-FI, 2021; UNDP, 2023; Stuchtey et al., 2020; Systemiq, 2022), capable of protecting and restoring marine and coastal biodiversity. This **new vision of a 'healing', 'regenerative'** Blue Economy also reflects the societal issues highlighted in the Nature-based Solutions (NbS).

Further schools of thought have most likely inspired the idea of the 'regenerative' sustainable development (Gibbons, 2020; Mang & Reed, 2020). The more engaged discourse is led, in particular, by the High Level Ocean Panel for a Sustainable Ocean Economy, or Ocean Panel,[15] created in 2018 at the initiative of Norway and 13 other countries, supported by associations, scientists, and the United Nations through Peter Thomson, Special Envoy of the Secretary General for the Ocean (Stuchtey et al., 2020). An additional four countries joined the Panel in 2022.

Following this new vision of the Blue Economy, with the term 'regenerative' introduced in 2020, some activities are therefore excluded from its scope, either because they are simply incompatible with the carbon reduction objectives of the 2015 Paris Agreement (Systemiq, 2022), such as oil extraction, or too threatening for marine ecosystems such as deep sea mining. Not all Blue Economy activities are sustainable (Keen et al., 2018).

Some sectors will have to set a better example in their practices to fall within the scope of this new Blue Economy, such as fishing, aquaculture, and tourism. New activities relating to Blue Carbon can be a part of this new regenerative sustainable Blue Economy from the outset, provided that best practices are applied. However, such best practices are still far from defined. The same applies to Nature-based Solutions (NbS,) for which the IUCN Global Standard for NbS™ provides a framework in this respect.

Given a new and more demanding sustainable Blue Economy focusing primarily on the health of marine and coastal ecosystems and the well-being of coastal populations, the activities to protect and monitor the marine environment are fundamental, as are the rules of good governance and fairness.

In economic terms, the goal is more a search for strong sustainability, a decoupling (Vierros, 2021) intended to move from relative to absolute (UNEP, 2011), with a view to disconnecting the negative impacts from the positive economic benefits gained (Eggermont et al., 2015; Godin et al., 2022; Theys, 2014). Recognising the non-substitution of natural capital is also a basis that should prioritise the conservation of such **blue** natural capital.

15 https://oceanpanel.org/fr/

New business models are being driven by coalitions, such as the 1000 Ocean startups,[16] Sustainable Ocean Alliance,[17] and RespectOcean[18] in France, which have launched new benchmarks such as the Ocean Impact Navigator (OIN). New initiatives are booming in various parts of the world which identify with this new inclusive, regenerative Blue Economy, such as the IUCN Great Blue Wall (GBW) initiative in the Indian Ocean (IUCN, 2022).

For now, it must be acknowledged that the new, regenerative, inclusive, and integrative Blue Economy is inadequately defined in terms of its scope, principles, implementation, and performance evaluation.

Preparing to go fishing, Tanzania (Photo: R. le Gouvello)

16 https://www.1000oceanstartups.org
17 https://www.soalliance.org/
18 https://www.respectocean.com/

3 Blue Economy – Definition, scope and principles

3.1 The concept and definition of Blue Economy

As stated in the preceding sections, the definition, scope, and principles of Blue Economy are clearly subject to interpretation, varying across time, space, medium, and issuing authority. Several recent publications and reports have attempted to analyse such differences (for example, Benzaken et al., 2022; European Commission, 2021a & 2021b; Keen et al., 2018; Pouponneau, 2023; Vierros, 2021; Voyer et al., 2018; Wenhai et al., 2019). Appendix 1 attempts to provide a (non-exhaustive) summary of the various proposed definitions for the Blue Economy or sustainable Blue Economy.

At this stage, a number of questions immediately come to mind, which directly impact the rest of this report:

- What name should be chosen and what adjectives should be added to 'blue economy'?
- What is actually being defined? Blue Economy, or Sustainable Blue Economy, or a new Sustainable Blue Economy, or Regenerative Blue Economy? Is it regenerative, inclusive, integrative, resilient?
- What priorities should be included in the definition, which will impact the future of how it is understood?
- What is the intention of such a definition? To provide a new approach, or to address previous ambiguities? For example, is it a new concept that offers a new way for societies to operate, as Gunter Pauli advocated when he spoke of a Blue Economy in 2010? Would such a concept be closer to a circular economy without having any specific connection to the Ocean (Pauli, 2010)?
- What are its goals, if a new definition is decided? Would IUCN take a clear and future position, a definition intended for use in future motions, following the same trajectory as the NbS (Cohen Shacham et al., 2016; 2019)?
- Who is it for primarily? What is the target audience of this future definition? This question refers back to IUCN's mission. Should the preferred target be IUCN members?
- Should the definition refer to a model, a new economic system, or a more all encompassing system, such as a full Blue Economy strategy that goes beyond strictly economic stakes and combines all environmental and social dimensions; an integrative proposal of associated governance with objectives that go far beyond economic considerations?
- Should a single definition be preferred, given the diversity of contexts and therefore visions of Blue Economy worldwide?

At this stage, from a semantic point of view, it seems clear that various authors and bodies conflate the Blue Economy with the 'Ocean Economy', or the 'classic' marine economy in the case of France (see Appendix 1, 2010–2012). On this point, the World Bank takes the 'Ocean economy' to mean the 'classic' marine economy, also called 'Brown

Economy', whereas it seems to refer to the Blue Economy in some publications as a sustainable Blue Economy, more like the sustainable Blue Economy described in this report (Patil et al., 2018; World Bank, 2021).

For the purposes of this publication, Figure 2 proposes a hierarchy for the Blue Economy, as follows: i) an Ocean Economy equated with the Blue Economy or Brown Economy; ii) a sustainable Blue Economy equated with a sustainable Ocean Economy; and iii) a regenerative Blue Economy which is the reference point to the attainement of the maximum level of sustainability. As such, with its environmental, societal, and economic requirements, the term 'sustainable Blue Economy' no longer seems to be sufficient in qualifying the regenerative Blue Economy. However, the term suggested by the G20 remains a possibility, as it is currently discussing principles for a 'sustainable and resilient blue economy'.

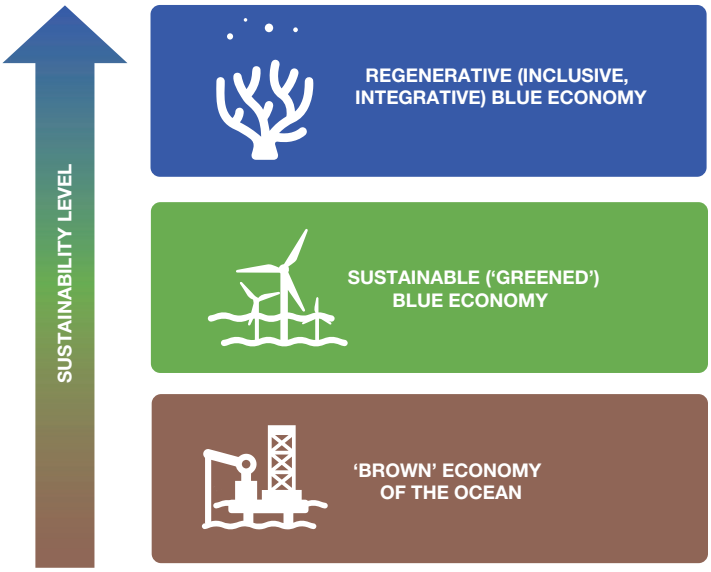


Figure 2 — Proposal of a sustainability hierarchy for a Blue Economy, sustainable Blue Economy, and a regenerative Blue Economy *Source: Authors.*

In view of IUCN's commitments, in particular its Ocean Programme, Blue Carbon projects (BNCFF), the Great Blue Wall,[19] (IUCN, 2022), and the NbS related to the ocean, a regenerative Blue Economy (which needs to be better defined) is being proposed to resolutely commit to a path of better accounting for issues such as marine and coastal ecosystem conservation and restoration, the well-being of impacted populations, equity, parity, equality, and intra- and intergenerational solidarity.

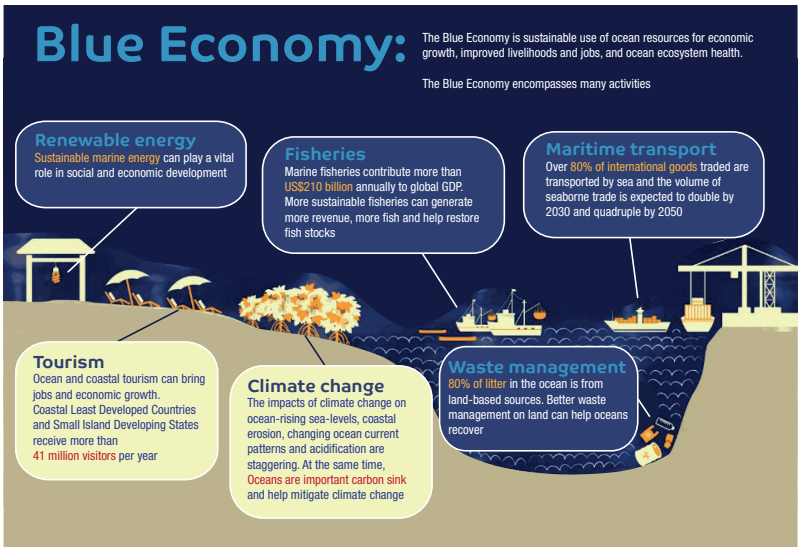


Figure 3 — Blue Economy illustrated by the World Bank
Source: World Bank (2017)

In terms of a methodological approach to semantics, it should be recalled that, of the various definitions proposed, some are very detailed, lengthy, and conflated with the related Blue Economy principles (for example, the WWF in 2015; see Appendices 1 and 2). Others are very concise, such as that often used by the World Bank (Figure 3), which has also been widely adopted by the international community (World Bank & UN DESA, 2017). That being said, can all the ambitions of a regenerative Blue Economy truly be expressed in a one, single definition?

19 https://www.iucn.org/our-work/projects/blue-natural-capital-financing-facility-bncff

The Blue Economy: The sustainable use of ocean resources for economic growth, improved livelihoods and jobs while preserving the health of the ocean.

(World Bank, 2017)

Amidst the debate on a Blue Economy definition, the Ocean Panel's clear and pragmatic approach should be noted (Stuchtey et al., 2020). The Panel has chosen to focus on action, priorities, and general principles, rather than spend time on finding a definition of Blue Economy, considered too theoretical. In the Panel's opinion, everyone (companies, sectors, countries, regions, and others) will take ownership of the Blue Economy concept in their own way, adopting a definition that suits themselves. This view is shared by Vierros (2021) in her review of the Blue Economy concept for the UN, which also recognises the complexity and diversity of views on the definition of the Blue Economy, noting the same source of ambiguities already observed in defining the ecosystem approach. However, the lack of clarity did not prevent the emergence of various legal and regulatory instruments to implement the ecosystem approach. Is it therefore truly necessary to spend months or years agreeing on a consensual definition of the Blue Economy, sustainable Blue Economy, or regenerative Blue Economy? Furthermore, Pouponneau (2023) shows that even for SIDS, the definition of a certain vision of the Blue Economy can be different between them,[20] as they are not part of a homogeneous group of States.

Similarly, some definitions are more operational, simply outlining the principles of the Blue Economy (Appendix 1).

3.2 Principles of Blue Economy

Vierros (2021) points out that, even without a clear and precise definition, the principles of the ecosystem approach were still clearly expressed. This is not yet the case for the Blue Economy. Clear principles that are used by the various stakeholders in the Blue Economy (for example, policy makers, economic players, civil society) would be valuable tools. As such, Vierros (2021) echoes the recommendation of Bennett et al. (2019) to set up a specific Blue Economy commission or agency, sponsored by the United Nations, that would define, oversee, and promote sustainable Blue Economy best practices based on previously developed and agreed upon frameworks and principles.

Several lists of sustainability principles relating to the Blue Economy have been drafted by various bodies. Certain principles have not yet been implemented, such as those of the G20, which are still being discussed at the time of writing (Appendix 2). Those of UNEP-FI (2018), issued by a consortium, including WWF, the European Commission, WRI, and the EIB, are intended to provide a framework for investments in blue finance. Vierros (2021) cited a list of four principles released on behalf of the IUCN that stem from a document issued by the Mangroves for the Future (MFF)[21] consortium at an event in Bangladesh (in 2015), but which seems to have no follow-up within MFF and the IUCN (Appendix 2).

The principles and scope of the Blue Economy, sustainable Blue Economy, or regenerative Blue Economy are linked to the definition and objectives chosen for the Blue Economy, with a

20 See in particular Table 1 presenting 16 different definitions in 16 SIDS (out of 37 SIDS), established between 2015-2021 by respective authorities (Pouponneau, 2023, pp. 72–74).

21 Mangroves For the Future http://www.mangrovesforthefuture.org/…

progressive level of sustainability requirements (Appendices 2, 3 and 4). The principles shown make it possible to set the boundaries of what the Blue Economy is and how it is implemented in various cases. Just like the order of words in a definition, the order chosen for these principles reflects the level of priority of a given Blue Economy objective.

The quick and visual comparison of sustainable Blue Economy principles (Appendix 2), published by WWF (2015), UNGC (UNGC, 2020), the Ocean Panel (Stuchtey et al., 2020), the United Nations (Lobmüller & Lieberknecht, 2021), and the G20 (February 2023 version currently being drafted) shows that, **in Principle 1, there is a clear trend for a sustainable Blue Economy that is based on the health of marine and coastal ecosystems**. WWF (2015) does not list this as its first principle; while it includes this among its priorities, it is relegated to second place. The Ocean Panel (Stuchtey et al., 2020) also does not explicitly define ecosystem and ocean health as a founding principle. In a new, more recent version (June 2023), the G20 has completely eliminated this founding Principle 1.[22]

The differences resulting from the comparison of the various sets of principles for a sustainable Blue Economy may also be related to the specific target audience for the principles, which could be economic players, governments, or civil society. Obviously, UNGC's principles (2020) generally target economic players. In any case, such a comparison needs to be refined. Within a single set of principles, some are redundant, while in other lists, issues some of which are major, are not clearly expressed such as governance issues. There is clearly room for collective work to develop and propose a set of founding principles that use a common definition with a view to outlining a regenerative Blue Economy.

3.3 Scope

The preceding sections have shown that the scope of Blue Economy, sustainable Blue Economy, and regenerative Blue Economy varies tremendously depending on how the concept is interpreted, which definitions are selected, and how the principles are stated.

Figure 4 proposes a stepwise approach for an increasingly restrictive scope of the Blue Economy in terms of the sectors or economic activities involved, depending on the degree of sustainability requirements, the renewal of the economic and societal model, and the paradigm shift.

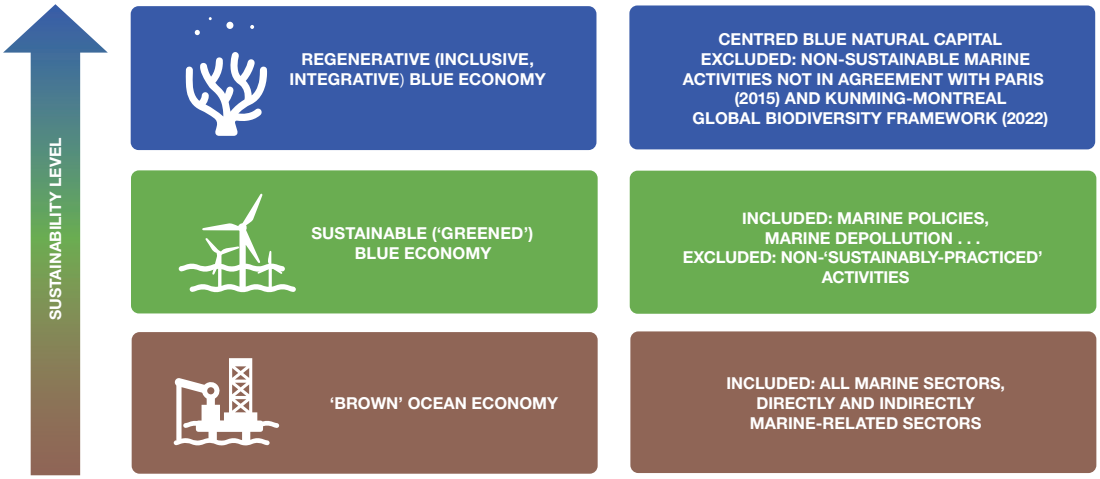


Figure 4. The possible areas of a Blue Economy, sustainable Blue Economy, and regenerative Blue Economy *Sources: Authors.*

[22] https://moes.gov.in/sites/default/files/2023-01/G20-Principles-for-a-Climate-Resilient-and-Sustainable-Blue-Economy.pdf

3.3.1 A 'brown' blue economy

In a Blue Economy that develops in line with the BAU model, a 'brown blue economy', as discussed by Patil (2018) based on the terminology used by the G20 (Appendix 2), all economic activities related to the sea are included. This Blue Economy, synonymous with the marine economy, is a compilation of all sectors for which the overall economic weight is calculated via the sum of the 'value added' (as defined by economists) of each sector considered. Discussions are more focused on the limits of conventional marine economy and the difficulties in terms of measurement and accounting. The approach is defined both by sector and geographical area, which immediately gives rise to several still largely unresolved questions, as highlighted in the latest publication of the French Maritime Economic Data (DEMF) (Kalaydjian & Bas, 2022b).

Sun drying of small pelagic fish, Mafia Island, Tanzania (Photo: R. le Gouvello)

First, an agreement must be reached on what should count and how to count it in a suitable and methodological manner, such that comparisons over time and between countries can be made. Colgan (2003) sets out principles that are followed by many authors (Surís Regueiro et al., 2013, for example). Many types of data must be accessible, including: (i) spatialised and comparable data across sectors; ii) comparable data across time periods; iii) reliable and quantifiable data following defined procedures; and iv) data that can be duplicated.

In geographical terms, it is worthwhile to ask whether or not to integrate onshore activities into the sectors under consideration, because such activities can:

- impact or decontaminate the marine environment, or
- involve a portion of the marine resources (for example, health or cosmetic products wherein one of the active ingredients comes from the sea, or a food industry that produces ready-made meals using marine compounds).

Extending the scope of the Blue Economy to clearly continental activities, such as inland fishing and aquaculture and their value chain, is an important point for the UNECA (2016), as expressed in the Nairobi Declaration in 2018.[23] In fact, in some African countries, these economic sectors in the African Great Lakes are of significant socio-economic significance.

In Europe (Eurostat, 2009), the geographical approach to the Blue Economy extends, for example, from 50 km[24] (Kildow et al., 2016) inland of the coast to the end of the EEZ, or, in the case of the United States, to its territories with a coastline. The risk of this strictly geographical approach is that it can confuse the Blue Economy with coastal economy, since a large part of the coastal economy is not necessarily maritime, especially since a major proportion of the world's population

23 "A sustainable blue economy builds on unlocking the full economic possibilities of the oceans, seas, lakes, rivers and other water resources through investments that involve effective participation of all relevant people while protecting the resources for present and future generation and ecosystem resilience." (UNECA, 2018, p. 6).

24 Geographical limit of 100 km for the ADB (AFD, 2023a)

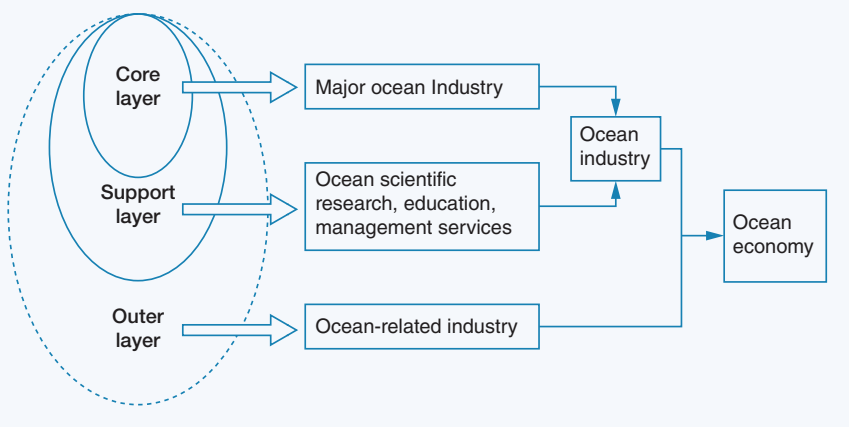


Figure 5 — Relationship between the different layers of the Chinese Ocean Economy *Source: Zhao et al. (2014, p. 168)*

now live within 100 km of the coast. The risk of '*maritimising*' (Dosdat & Moulinier, 2014) these sectors must therefore be avoided. In addition, a growing share of sea-related activities can also be carried out far away from the coast, at sea or on land.

From the perspective of AFD (2021),[25] an Ocean Blue Economy has a geographical component. It brings together various activities at sea and within a 30-km coastal line, as recommended by the Conservatoire du Littoral (French Coastal Conservancy Authority) (AFD, 2023a). However, the main challenge was to include the protection and restoration of marine and coastal ecosystems, and its management (for example, ICZM and MSP), as well as pollution prevention in the marine environment (coastal infrastructure, solid and liquid waste management).

In the case of China, Blue Economy, or 'Ocean Economy', is organised around major industries, such as fishing, aquaculture, and port activities, before expanding into excentric circles of activities related to the 'core business' of traditional maritime activities (Zhao et al., 2014) (Figure 5). From this perspective, Dosdat and Moulinier (2014) while reflecting on the place of the Blue Economy in Brittany, France, make use of the estimated '*maritime*' extent as an indicator for a given activity.

Although this two-fold geographical and sector-based Blue Economy recommended, it is not sufficient. The scope of the Blue Economy is often summarised in tables that exhaustively list and explain all the various sectors to be considered in the Blue Economy accounting (Appendix 3). Extending the scope to non-market activities is also recommended. Park (2014b) points out that the economy is then a broader term that encompasses not only private industrial activities, but also all non-market sectors. Government, administrative, monitoring, research, and training jobs, among others, are also part of the marine economy. Likewise, environmental, marine, and coastal ecosystem protection activities, such as the cost of cleaning beaches or wastewater management in coastal communities, for example, can also be included.

In such a widely-scoped Blue Economy, any connection with the marine (or aquatic) environment includes, de facto, the associated economic sector, except in a few cases such as the exclusion of the naval military sector (ECORYS, 2012). The various sectors of the Blue Economy are grouped differently in many reports. In Europe, for instance, there are nearly 27 sectors. The OECD (2016) categorises them into 'established' and 'emerging' economic sectors of the marine economy, while the World Bank and the United Nations list five major sectors, with various activities within each sector (Appendix 3) (World Bank & UN DESA, 2017).

In France, according to the latest DEMF data (Kalaydjian & Bas, 2022, p. 7), the marine economy is often mistaken with the Blue Economy; all relevant sectors are listed to calculate a marine GDP, including river activities

25 https://www.afd.fr/fr/ressources/afd-et-ocean

and freshwater production (fish farming) (Appendix 3). However, the blurred French definition of the Blue Economy is highlighted by the authors of the DEMF and the Thebaud report (2021).

In Europe, the sectors that are considered by both the Blue Economy Observatory[26] and the 2021 report of the European Commission (2021a) are listed differently, as shown in Figure 6, and seem to focus on the industrial sectors. It is noteworthy to mention that the marine and coastal ecosystem protection and restoration, as well as all marine environment decontamination activities, are missing from the list.

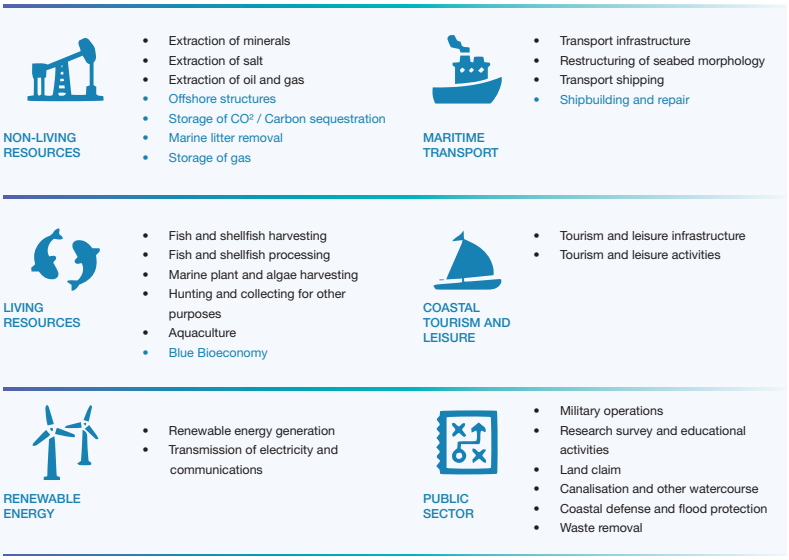


Figure 6 — Sectors of the Blue Economy in Europe
Source: (European Commission, 2021a, p. 14)

3.3.2 'Greening' sustainable Blue Economy

The evolution from a Blue Economy to a sustainable Blue Economy, between 2012 and 2020, gradually led to two major impacts on how the Blue Economy is understood:

- The extension of the scope of the Blue Economy towards a sustainable Blue Economy that includes not only market or non-market economic sectors, but also governance and strategic tools alongside a set of legal and regulatory instruments to accompany the implementation of a more inclusive sustainable Blue Economy (according to the World Bank in 2017).[27] The idea is to go beyond the strictly 'basic' economic approach.

- The inclusion of activities for the protection, repair, and restoration of marine and coastal ecosystems within the scope of the sustainable Blue Economy, as well as ecosystem services, with ecological functions such as Blue Carbon sequestration.

- The requirement that all activities participating in sustainable Blue Economy be qualified as sustainable, as defined by the sustainability requirements for each sustainable Blue Economy sector. All activities, including critical sectors such as oil and mining, may continue to be part of the sustainable Blue Economy, provided that their impacts are reduced, minimised, or offset (European Commission, 2021b). The precautionary principle is raised by several organisations when certain activities are considered to be gravely critical such as deep sea mining (World Bank & UN DESA, 2017) (voir Appendix 3).

- Adherence to the SDG framework provided by the United Nations (2015), in particular to SDG 14.

OECD (2020), with its objective of investment and financial support for emerging countries

26 https://blue-economy-observatory.ec.europa.eu/eu-blue-economy-sectors_en

27 "The Blue Economy encompasses the range of economic sectors and related policies that together determine whether the use of oceanic resources is sustainable.» (World Bank & UN DESA, 2017)

in the form of Official Development Assistance (ODA), clarified the discussion on the scope of the sustainable Blue Economy, which now considers six main areas for a higher level of sustainability (Appendix 3). On the other hand, when applied to SIDS, UNDP (2023) lists 22 activities for a Blue Economy, five of which are considered as fundamental: fishing and aquaculture, tourism, transport and ports, marine renewable energies (MREs), and desalination.

With regard to the specific cases of fishing and aquaculture ('sustainable seafood'), sectors considered to be paramount for primary production from marine bioresources, they have been part of the sustainable Blue Economy from the outset, **irrespective of the interpretation, definition, or principles of the Blue Economy**. However, they remain associated with a broad package or series of measures to make them sustainable. These examples reveal the grey areas that underly the inclusion of all sectors within the scope of the sustainable Blue Economy, insofar as they are carried out in a sustainable way or if the precautionary principle is applied. In spite of all the precautions and criticisms expressed and all the various incentives and approaches, including labels, it cannot be concluded today that all forms of aquaculture are sustainable, nor that the ecosystem approach that has been advocated for since 2008, is well integrated across the board (Brugere et al., 2018; le Gouvello et al., 2023).

New sectors whose very purpose is to reduce greenhouse gas (GHG) emissions or protect and restore marine and coastal ecosystems are clearly highlighted: the use of MRE, the creation of marine protected areas (MPA), or the restoration of certain habitats (mangroves, coral reefs) within the framework of the Blue Carbon principle habitats (Box 2).

In an effort to clarify these points of contention, UNEP-FI, in its report *Recommended Exclusions for Sustainable Blue Economy Financing* (2021),[28] provided an exclusion criteria for each sector to better delineate sustainable investments. Such indications could provide a basis for a criteria defining the scope of the regenerative Blue Economy and assessing the legitimacy of an activity within a highly sustainable Blue Economy. However, in reality, it is not that simple to apply. For example, those existing aquaculture projects or activities established outside the recommended zones and which do not comply with current regulations, and other measures, are excluded (UNEP-FI, 2021). Breeding or farming introduced, potentially invasive species is considered an exclusion criterion, **unless permitted by local legislation** (UNEP-FI, 2021). Such criterion, nonetheless, is not enough to exclude, for example, the contentious farming of Atlantic salmon in Chile. In this case, however, other exclusion criteria based on social rights may result in exclusion.

3.3.3 The potential scope of regenerative Blue Economy

Following the criticisms from several figures in the scientific community (Bennett et al., 2019; Sumaila et al., 2020), sustainable Blue Economy as proposed by the Ocean Panel (Stuchtey et al., 2020), or rather the regenerative Blue Economy as used in the Great Blue Wall (IUCN, 2022) and by the Systemiq report (2022), is ramping up its requirements for 2050. Although not all economic sectors considered in the Blue Economy, or even the sustainable Blue Economy, can be considered part of the regenerative Blue Economy, and, subsequently, future investments. The same logic seems to apply in the document issued by the OECD (2020) (Table 1), where the the concept is more explicit.

28 Sectors taken into account are: seafood (wild-caught fish and aquaculture); ports; maritime transportation; marine renewable energy; coastal and marine tourism; coastal resilience: infrastructure and Nature-based Solutions; waste prevention and management (UNEP-FI, 2021).

Box 2 — Blue Carbon

Mangrove area, Zanzibar (Photo: F. Simard)

The valuation of coastal and marine ecosystem services has been included in the scope of the Blue Economy and sustainable Blue Economy since the early stages of the Blue Economy's history (UN DESA, 2014). Among them, the ecosystem service of carbon sequestration by ocean ecosystems has been seen as one of the most promising opportunities for the protection of marine and coastal ecosystems in the emerging sectors of the Blue Economy as quoted in most papers. Although it is still an emerging market, the Blue Carbon market is an opportunity not only to protect coastal and marine ecosystems, but also as an economic opportunity following the models of carbon markets, carbon credits or carbon offsets, whether that is done through protecting or planting of terrestrial forests.

While it is now widely acknowledged that the Blue Carbon market is a major component of the sustainable Blue Economy, it is also recognised that there is a need to better provide it with a clear framework such that Blue Carbon initiatives are fully sustainable and do not drift towards a 'blue-washing', which would be even more detrimental to the environment and communities.

Issues related to Blue Carbon have been discussed in an increasing amount of research. The involvement of the IUCN and NGOs, such as Conservation International (CI), has been quite major over the past decade. A reference definition of Blue Carbon, used by the World Bank in an early paper on the Blue Economy (World Bank & UN DESA, 2017), was proposed by the IUCN and CI. The present involvement of the IUCN in Blue Carbon is described, with the adopted framework of the dedicated teams.

DEFINITION

Blue Carbon is carbon stored in coastal and marine ecosystems.

CONTEXT

Coastal ecosystems need to be conserved and restored as globally significant carbon sinks. Despite their small extent relative to other ecosystems, they sequester and store globally significant amounts of carbon in their soil. The ongoing destruction and loss of these systems contributes to additional human induced greenhouse gases. Alongside tropical forests and peatlands, coastal ecosystems demonstrate how nature can be used to enhance climate change mitigation strategies and therefore offer opportunities for countries to achieve their emissions reduction targets and Nationally Determined Contributions (NDCs) under the Paris Agreement.

Additionally, these coastal ecosystems provide numerous benefits and services that are essential for climate change adaptation, including coastal protection and food security for many communities globally.

On an implementation level, mangroves, salt marshes and seagrasses can be included in national accounting, according to IPCC's *2013 Supplement to the 2006 Guidelines for National Greenhouse Gas Inventories: Wetlands* (IPCC, 2014).

PRINCIPLES

- Coastal ecosystems, such as mangroves, tidal marshes and seagrass meadows, sequester and store more carbon per unit area than terrestrial forests and are now being recognised for their role in mitigating climate change.
- These ecosystems also provide essential benefits for climate change adaptation, including coastal protection and food security for many coastal communities.
- However, if the ecosystems are degraded or damaged, their carbon sink capacity is lost or adversely affected and the stored carbon is released, resulting in carbon dioxide (CO_2) emissions that contribute to climate change.
- Dedicated conservation efforts can ensure that coastal ecosystems continue to play their role as long term carbon sinks.

IUCN involvement in Blue Carbon is carried out under the umbrella of:

BNCFF
Blue Natural Capital Financing Facility

or the Blue Natural Capital Financing Facility (BNCFF).

The BNCFF supports the development of sound, investment-based BNC projects with clear ecosystem service benefits, based on multiple income streams and appropriate risk return profiles. The BNCFF is managed by the IUCN and funded by the Government of the Grand Duchy of Luxembourg.

BLUE CARBON
ACCELERATOR FUND

or the Blue Carbon Accelerator Fund (BCAF)

The BCAF supports Blue Carbon restoration and conservation projects in developing countries and helps pave the way for private sector funding. The BCAF is funded by the Australian Government and is implemented in partnership with the IUCN.

An example of Blue Carbon revenue is provided through the study case of the extensive shrimp farming and mangrove protections in Indonesia (le Gouvello et al., 2023).

Sustainability evaluation and quantification framework

Most of the work done on Blue Carbon has been associated with the work carried out on carbon credits, using similar approaches. CI has defined specific the following sustainability principles and guidance for Blue Carbon:

- Principles of High Quality Blue Carbon, including the IUCN Global Standard for NbS.
- Most Blue Carbon on the volontary carbon market, voluntary: from incentives to compliance
- Ocean accounting rely on key concepts of:
  - Natural capital: living and non-living natural elements that produce value or benefits for people.
  - Ecosystem services: benefits that nature provides for society.
  - Trace flows from the environment to society/the economy, to measure dependencies.

[a)] For more information, please see: Herr, D., Pidgeon, E. & Laffoley, D. (eds) (2012). *Blue carbon policy framework: based on the discussion of the international blue carbon policy working group*. Gland, Switzerland and Arlington, Virginia, United States: International Union for Conservation of Nature and Conservation International. https://portals.iucn.org/library/sites/library/files/documents/2012-016.pdf

Table 1. The main areas for a sustainable Ocean Economy according to the OECD, UNEN, and Ocean Panel *Source : Authors*

OECD (2020)	UNEN (DAVIES & VAUZELLE, 2023)	OCEAN PANEL (STUCHTEY ET AL,. 2020)
Conservation and restoration	The indirect contribution to economic activities and healthy environments – carbon sequestration, coastal protection, and the existence of biodiversity and biodiversity services	Ocean restoration and protection
Sustainable seafood	Harvesting of marine resources and their transformation and trade, such as seafood, pharmaceutical products, freshwater generation	Sustainable ocean food production
Sustainable tourism		Tourism (ecotourism)
Pollution reduction (inland)		
Greener transport and ports	Commerce and trade in and around oceans – transport, coastal development, tourism, and recreation	Low-carbon transportation and ports
Marine renewable energy	Use of non-exhaustive natural forces – generation of offshore renewable energy, such as wind, wave or tidal energy	Clean ocean energy

Each major industrial sector has a qualifying description that restricts its scope. In the energy field, only the MRE sector is cited. Offshore oil drilling contravenes the Paris 2015 objectives and must be excluded from the scope of the regenerative Blue Economy. Similarly, deep-sea mining, including within EEZs, must be prohibited as a precaution, as there is too much uncertainty about its impact. The economic sector must demonstrate its **positive** impacts in terms of the objectives for a low carbon economy set out in the 2015 Paris Agreement and/or on marine and coastal biodiversity (Figure 7).

In this setting, the approach is similar to the design, principles, and assessment of NbS using the Global Standard (IUCN, 2020a & 2020b). Similarly, the framework proposed by the latest IPCC and IPBES reports is echoed by UNEP in the implementation of the Kunming-Montreal GBF and the Nature+ economic goal framework (UNEP, 2021), as well as by AFD (2022).

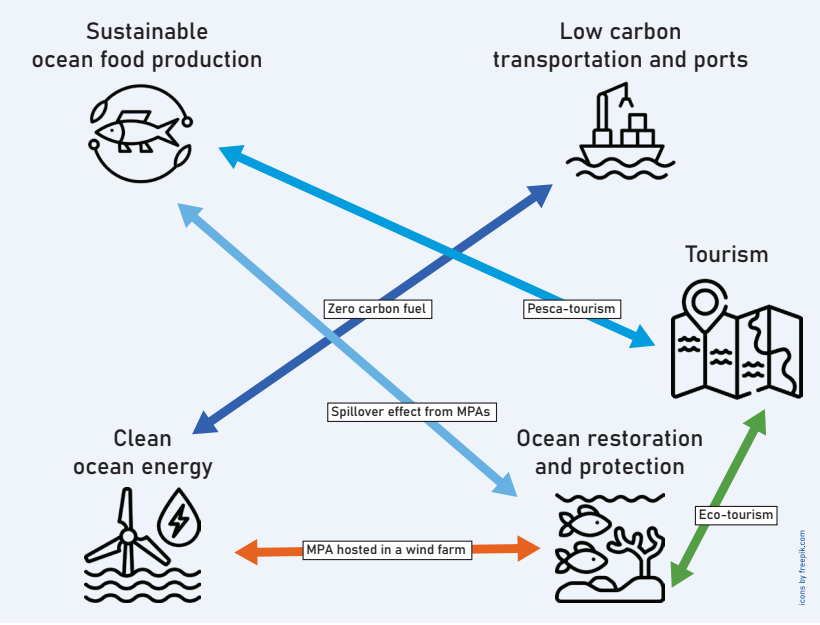


Figure 7 — The new scope of a Sustainable Ocean Economy
Source: Stuchtey et al. (2020, p. 56)

For major Blue Economy sectors, such as maritime transport, the objective is to promote the transition to low or no carbon transport (such as sailing, electric propulsion, or hydrogen), leading to an almost absolute decoupling of gas emissions from the transport sector. This is contrary to the sustainable Blue Economy's proposal that only proposes a somewhat relative decoupling.

For key sectors, such as fishing, this further step towards a regenerative Blue Economy would definitely exclude certain fisheries using destructive machinery (such as trawlers) or practices deemed too 'industrial' (Davies & Vauzelle, 2023). Social criteria are emphasised in favour of artisanal fisheries, or 'small-scale fisheries' (FAO, 2022). Nevertheless, artisanal fishing must still be carried out in a sustainable manner, avoiding overfishing or the use of destructive techniques such as dynamite fishing. Regardless of its methods, fishing is an inherently destructive act, as it is a predatory activity with no biodiversity gain. This example shows that, with respect to the regenerative Blue Economy, a collective dimension at the maritime territory scale defined as a 'merritory' or 'sea territory' by some authors (Parrain, 2012), will have to be considered for sustainable fisheries to be associated with ambitious protection measures. Likewise, and marine protection areas will need to be established to compensate for fishing in and of itself (Figure 7). Thus, the vision of the regenerative Blue Economy under a micro-economic perspective or a single-sector lens will obviously be not sufficient.

A similar discussion can take place regarding marine aquaculture. While productions, such as shellfish and algae, seem to be able to fall within the scope of the regenerative Blue Economy from the outset (subject to best environmental and social practices, with certain limits), the potential definition of the regenerative Blue Economy and its requirements would be difficult to reconcile with an expanding industrial aquaculture, such as salmon farming, which has high energy requirements, consumes forage fish, and destroys the environment, not to mention the negative social impacts (for example, in Chile) (le Gouvello et al., 2022 & 2023). The goal of developing offshore aquaculture as proposed by Norway (Box 3) is likely to fall within the scope of the sustainable Blue Economy, provided that such futuristic aquaculture is carefully controlled from a technological standpoint and its impacts minimised (see the example provided by the Ocean Panel in Stuchtey et al., 2020). However, it is less certain to fall with the scope of the regenerative Blue Economy, unless a different, more integrated system is considered, such as integrated multi-trophic aquaculture or multi-purpose offshore platforms, as shown by the example of open sea aquaculture such as combining MRE and low trophic aquaculture (Maar et al., 2023).

Regardless of the discussion around the scope of the Blue Economy/sustainable Blue Economy/regenerative Blue Economy, it immediately harks back to previous chapters on the need for a consistent definition with clear principles. The next chapters will discuss assessments, key performance indicators (KPIs), implementation, legal instruments, and connections with other frameworks and concepts.

Box 3 — Example of an innovation based on mariculture technology *Source: Stuchtey et al. (2020, p. 45)*

Credit: SalMar

SalMar's Ocean Farm 1 is one of the largest offshore marine mariculture pens. Built in China and deployed in Norway, the 110-metre wide structure is predicted to be able to hold over one million salmon. Apart from its enormous size (250,000 m^3), it is able to withstand 12-metre waves and is equipped with over 20,000 sensors that monitor the well-being of the fish.

3.4 Inclusive Blue Economy

How can does one ensure that the Blue Economy is inclusive, fair, and does not contribute to social inequalities? How can the economic model proposed in a Blue Economy overcome the many criticisms and flaws of the dominant neoclassical model? These major points are present in the various principles set out for a sustainable Blue Economy (Appendix 2),[29] and have been clearly stated by the UN DESA since 2014 (UN DESA, 2014). Some researchers are also asking crucial questions, advocating for an inclusive Blue Economy, a 'blue justice' (Bennett et al., 2019, 2021 & 2022; Hoegh-Guldberg et al., 2019; Voyer & van Leeuwen, 2019).

In fact, Virdin et al. (2021) showed that 60% of the revenue from the eight major sectors of the Blue Economy (hydrocarbon drilling, shipbuilding, maritime equipment, seafood, shipping, port activities, cruises, and MRE) are in the hands of 100 major groups ('the Ocean 100'). The investment required to develop an offshore activity is significant – MRE included – which explains this trend. While such projects can lead to significant economic benefits for the relevant countries, the 'fair' economic and social benefits for local populations are sometimes difficult to ascertain. Bennett et al. (2021) stress the connection between inclusive governance and blue justice, highlighting the risks of social injustice, exclusion of vulnerable populations, women, small-scale fishing activities artisans entrepreneurs, and local communities in an Ocean Economy that does not include social dimensions in its implementation. They provide recommendations to overcome such situations (Box 4) (Bennett et al., 2021, Table 2, p. 12, and reiterated by Claudet, 2021).

For aquaculture, a sector for which societal issues are paramount (food security, income, and the well-being of coastal populations), the issue of developing aquaculture "that leaves no one behind" (Hambrey, 2017) has long been raised (Kaminski et al., 2020; Campbell et al., 2021; le Gouvello et al., 2023; Brugere et al., 2023; Troell et al., 2023). Indeed, the development of modern salmon aquaculture did not necessarily take local social, economic, and cultural requirements into account. Species

Box 4 — Key recommendations and actions for advancing social justice in the ocean economy

Advancing social justice in the Ocean economy with:

RECOGNITIONAL JUSTICE

- Identify and differentiate rights holders and stakeholders;
- Acknowledge pre-existing rights and tenure;
- Incorporate pre-existing practices, institutions, and knowledge systems;
- Integrate diverse worldviews, perspectives, and values.

PROCEDURAL JUSTICE

- Facilitate inclusive, participatory, transparent, and accountable planning and management;
- Ensure that participants perceive that institutions, policies, managers and management actions are legitimate;
- Create adaptive and context-appropriate decision processes;
- Support local capacity for participation and co-management;
- Ensure stakeholders have access to justice and conflict resolution mechanisms.

DISTRIBUTIONAL JUSTICE

- Consider equity in distribution of costs and benefits over time, space, and between groups;
- Design fair compensation and mitigation mechanisms;
- Adapt management to improve social and distributional outcomes.

Source: Bennett et al. (2021, p. 12)

29 See Appendix 2, 'Inclusiveness' featured in pale orange colour.

farmed in the sea are considered to be of higher value and are often destined for export. Chile is a striking example, not to mention the social and environmental damage lamented by several NGOs.[30] Conversely, recent work by Krause et al. (2020) has shown that the socio-economic benefits of salmon farming in coastal communities are more positive on the North American coast, which would indicate that more harmonious development is possible.

Even in the case of very promising projects, some major issues are raised, such as the development of large-scale algae crops, projects that fall under Blue Carbon, as well as those that require large budgets, guaranteeing equity and the well-being of the people involved (Alleway, 2023). For example, how will the Kelp Blue forest project[31] off the coast of Namibia ensure that local societal requirements are met?

Proposals have been made to guarantee this

Une femme acheteur de poisson, Tanzanie (Photo: R. le Gouvello)

equity in the development of aquaculture (Brugere et al., 2023; Eriksson et al., 2018; Kaminski et al., 2020), or specifically an aquaculture 'for' local communities (Campbell et al., 2021). Their assessment using specifications such as the IUCN Global Standard for NbS™ can also help identify pitfalls and set out a roadmap to overcome these issues (Hughes, 2021; le Gouvello et al., 2023).

3.5 Governance fitting for the Blue Economy

The aforementioned pitfalls (lack of inclusion, lack of social justice) and risks of environmental collateral damage due to the specific features of the marine environment call for a transparent, tailored, and clearly enforced governance system to accompany the development of the sustainable Blue Economy (Bennett et al., 2019; Ehlers, 2016). This key issue is also clearly reflected in certain principles (Appendix 2)[32] developed for a sustainable Blue Economy by the WWF (2015), UNEP (2021), and the Ocean Panel (Stuchtey et al., 2020). It is the subject of much research. The established system of governance (including various legal and regulatory tools) must be simultaneously 'top down' and 'bottom up', participatory, and inclusive (Niner et al., 2022). Each of these aspects is difficult to address when only centralised administrations make decisions and supervise the deployment of offshore activities that are increasingly further out in territorial waters and at the edge of the EEZ. Furthermore, global governance for the high seas is needed to better preserve and protect them (BBNJ).[33] For Nagy and Nene (2021), the challenge will be to develop Blue Economy governance methods that are adapted to each region of the world, especially Africa, rather than impose a single model from the northern hemisphere.

For Keen et al. (2018), all governance frameworks, legislative instruments, decision-making methods, and management of offshore activities are an integral part of the sustainable

30 https://marpatagonico.org/
31 https://kelp.blue/namibia/
32 See Appendix 2, 'Governance' featured in bright yellow.
33 https://www.un.org/bbnj

Blue Economy, as proposed by the AFD in its 2019 Ocean Strategy. For Bennett et al. (2019), good Blue Economy governance must be inclusive. In their recommended tools, Lubchenco et al. (2020) insist on an ecosystem approach to establish the priorities of the sustainable Blue Economy. Many authors also refer to the Marine Spatial Planning (MSP) tool (Queffelec et al., 2021; Winther et al., 2020). However, the implementation of MSP is an issue in and of itself. It can sometimes appear as a way to claim marine space for new economic activities by industrialising the space, referred to as 'ocean grabbing' by several authors (Bennett et al., 2015; Barbesgaard, 2018; Bennett et al., 2021; Queffelec et al., 2021), to the detriment of marine and coastal biodiversity and more ancestral or traditional coastal activities.

An option is proposed by Winther et al. (2020), who advocate for an Integrated Ocean Management (IOM) based on an ecosystem approach, Integrated Coastal Zone Management (ICZM), marine spatial planning (MSP), adaptive management, local management, and 'area-based measures' including setting up MPAs.

When describing how to assess the performance of the Blue Economy at the coastal socio-ecological system level, the framework proposed in the work of Nobel Prize winning economist E. Ostrom (McGinnis & Ostrom, 2014) is echoed in the studies on Blue Economy in Japan (Morgan et al., 2022) (Chapter 7), with a section on 'governance' sub-system as an integral part of the analysis.

3.6 Blue finance

Financing arrangements for the Blue Economy, sustainable Blue Economy, and regenerative Blue Economy are also crucial. This is a matter for public policies, incentives, taxation or subsidies. The tools could be private or by using public-private partnerships (PPPs). Principles for sustainable blue finance were proposed in 2018 by a consortium formed by the UNEP-FI, the WWF, the European Commission, the World Resources Institute (WRI), and the European Investment Bank (UNEP-FI, 2018). They are now widely reflected in various policy documents. Sumaila and other researchers argue that there is a need for innovative mechanisms for sustainable investment in the Blue Economy, particularly with the emergence of the concept of and market for 'blue bonds', pioneered by the Seychelles (Box 5) (Bosmans & de Mariz, 2023; Jouffray et al., 2020; Mallin and Barbesgaard, 2020; Sumaila et al., 2020; Sumaila et al., 2021; Tirumala & Tiwari, 2022).

In the area of international cooperation, the work carried out by the OECD in cooperation with the World Bank (2020) to evaluate international aid and Official Development Assistance (ODA) for a sustainable Blue Economy should be noted. The ADB's proposed approach is also an example of clarifying responsible investments (ADB et al., 2022).

For a sustainable Blue Economy to be responsibly financed, however, it must be emphasised that a set of evaluation criteria, applied to collective or strictly private projects, will have to be relied upon, making this an approach largely dependent on how the Blue Economy is understood.

New blue finance investors have emerged, including various platforms to speed up solutions and start ups, which was the object a survey (Systemiq, 2022) highlighting the Ocean Index Navigator, driven by the 1000 Ocean Startups coalition (Appendix 5, NGOs and think tanks). Blue carbon financing schemes (Box 1) are also a part of these new instruments to finance the Blue Economy. NGOs like CI or intergovernmental organisations like the IUCN (via the BNCFF) and various foundations also actively promote sustainable or even regenerative blue finance. Furthermore, certain new PPPs are noteworthy,

Box 5 —Blue bonds, an emerging concept and market

The blue bond market is new and was born of the need to find innovative ways to fund the Blue Economy. The concept of blue bonds and their implementation is not immune to the same need for clarification as that of the broader debate on Blue Economy in this report, with a definition, scope, decision on how to measure their sustainability, etc. (Figure 8).

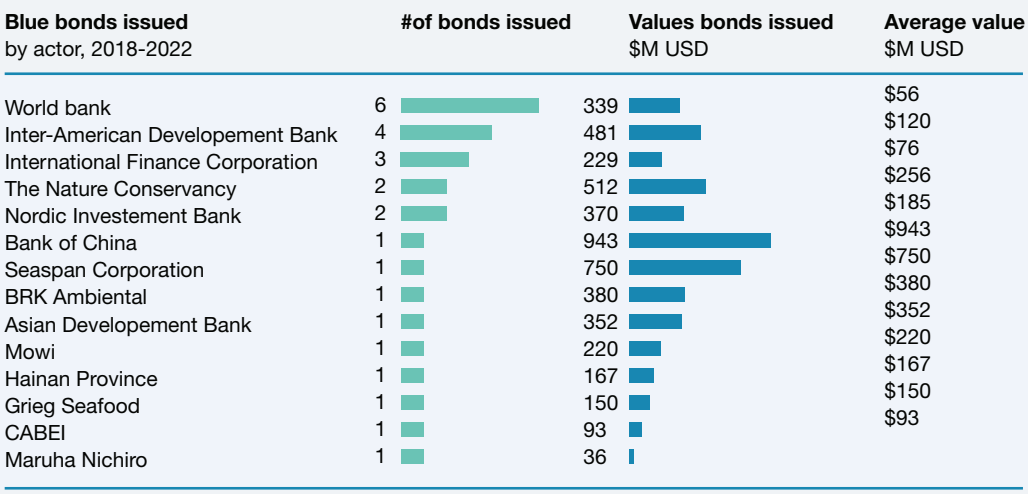


Figure 8 —Blue bonds issued by stakeholder (2018–2022)
Source: Bosmans & de Mariz (2023, Figure 11, p. 19)

SEMINAL AND MAJOR WORKS

The blue acceleration: the trajectory of human expansion into the ocean (Jouffray et al., 2020).

Awash with contradiction: Capital, ocean space and the logics of the Blue Economy Paradigm (Mallin & Barbesgaard, 2020).

Ocean Finance: Financing the Transition to a Sustainable Ocean Economy (Sumaila et al., 2020).

Financing a sustainable ocean economy (Sumaila et al., 2021).

Innovative financing mechanism for blue economy projects (Tirumala & Tiwari, 2022).

The Blue Bond Market: A Catalyst for Ocean and Water Financing (Bosmans & de Mariz, 2023).

Source : auteurs

such as that set up in the Government of Seychelle, the NGO The Nature Conservation, and other public and private players, to finance the Seychelles' Blue Economy strategy via the Seychelles Conservation and Climate Change Adaptation Trust[34] (SeyCCATT), which is similar to a blue bond (Box 5 and Appendix 5, section on Africa) (Benzaken et al., 2022; UNEP, 2015; Okafor-Yarwood et al., 2020). The launch of the GBW follows in these footsteps (IUCN, 2022).

3.7 Assessment and indicators

As in mentioned in previous sections, assessing the Blue Economy and measuring its performance and its ability to meet previously set objectives are all intimately linked with prior choices earlier. This is a major and central element for donors when allocating various funds.

34 NGOs (primarily TNC), private foundations and international bodies, such as the UN and the World Bank, among others, contribute to this fund.

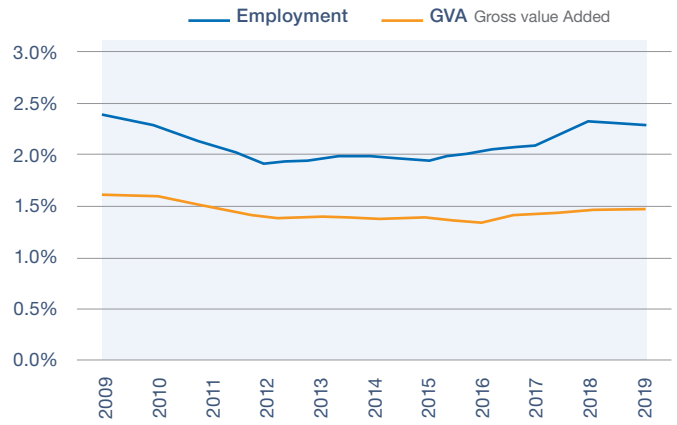


Figure 9 — Contribution of the Blue Economy to the overall EU economy

Source : (European Commission, 2022, p. 6)

3.7.1 Key performance indicators of 'brown' Blue Economy

In a conventional marine economy, including the emerging sectors of the broad scope of Blue Economy, specific accounting is based on all the economic and social indicators associated with the monitoring of economic activities, including those of the Blue Economy (Kildow & McIlgorm, 2010; Surís Regueiro et al., 2013). Data are collected by government agencies at regional and national levels. Each country (or region, or supranational authority) has its own system for monitoring the performance of the traditional Blue Economy.

Ebarvia (2016) refers to accounting as defined in the UN Statistical Commission's System of Environmental and Economic Accounting (SEEA). China is conducting much research and studies to estimate a blue GDP (Zhao et al., 2014). A 'barometer for the marine economy' by the audit firm Price Waterhouse Coopers is cited by Dosdat and Moulinier (2014). From the perspective of the market sector, the specific nomenclature of given industries must be used, although it is not always easy to identify a company's relative share of activities involving the ocean when it is not clearly specified that such activities are 100% marine-based in spite of using keywords in the company's corporate mission statements. This varying nomenclature and the activities it designates must be harmonised so that comparisons can be made. For example, in Europe, several nomenclature tables have been published by Eurostat with a view to harmonising across European countries by way of both a European coding system and data collection processes. Geographical codes should also be considered to better identify coastal activities.

Performance is assessed at the microeconomic level, by measuring companies' production (revenue) and economic profitability, as well as the macroeconomic level (sector, State, region, country), and afterwards calculating the added value for a type of activity or value chain, which then allows a percentage-based quantification in terms of regional and national GDP (Kalaydjian & Bas, 2022b). The OECD uses these elements to compare countries (OECD, 2020). The (estimated) number of jobs by full-time equivalents (FTE) is also calculated (for Europe, for example, see Figure 9).

Whichever Blue Economy model is chosen, it will be difficult not to provide these indicators for market and non-market economic activities, using these highly conventional, established and widely-used approaches. For new economic sectors, in particular protection and enhancement of ecosystem ecosystem services, the aim is to introduce a new field of KPI proposals by using figures for environmental damage and environmental impacts, and valuation of ecosystem services, environmental economics applied to the sea and coast (Mongruel et al., 2019).

At this stage, a general uncertainty remains as to how the economic impact of a Blue Economy is to be quantified at the macro level, which makes it difficult to make reliable comparisons between countries. Caution is thus required. Finding and sharing reliable data is still a major challenge, even in historic sectors such as fishing.

3.7.2 Key performance indicators of sustainable Blue Economy

Many grey literature and scientific publications examine the difficulties in monitoring, measuring, and evaluating KPIs on the sustainability of the Blue Economy.

The challenges have several layers:

- defining what needs to be assessed in the sustainable Blue Economy framework, such as sector or scope (see previous section),
- identifying and using benchmarks to assess the sustainability of the selected sector(s), and
- assessing cross-sector sustainability, the sustainability of a project, strategy, or implementation of the sustainable Blue Economy, including governance processes at a defined geographical level.

For example, the European Commission, following an analysis of the various proposals on the matter, proposed several combined approaches to monitor Blue Economy performance and assess the sustainability of the sustainable Blue Economy by proposing a Blue Economy Sustainability Framework (BESF[35]) (European Commission, 2021b & 2021c).

In this approach, Europe has put together in its annual report on the Blue Economy (European Commission, 2021b & 2021c), companies' accounting taken into consideration, and aggregated at the sector level based on corporate social responsibility (CSR), or the 'triple bottom line'. This provides information on many quantitative and qualitative indicators, with the results being published in a CSR report on the sustainable development of the company or aggregated by economic sector. The aim is to verify how each of the identified sectors in the sustainable Blue Economy stacks up relative to specific benchmarks assessing the sustainability of the sector.

For example, regarding aquaculture and fishing, referencing label specifications has been suggested, namely the Marine Stewardship Council (MSC) and the Aquaculture Stewardship Council (ASC) labels, among others, despite the many criticisms received by these two labels (Amundsen, 2022; Bush et al., 2013; Jacquet et al., 2010; Osmundsen et al., 2020).[36] However, other methods to assess the sustainability of the sector, which cite scientific research, are also being proposed (for aquaculture, for example, see Valenti et al. (2018)). At the sector level, the European Commission recommends the Value Chain Analysis (VCA) framework, based on the work by Porter (1980) and applied, for example, to sea-based products (Veronesi-Burch & Maes, 2017).

Sustainability benchmarks have been proposed by coalitions of stakeholders, economic players (for example, the Global Reporting Initiative or GRI[37]) and NGOs (such as the Green Economy Tracker[38]).

Other organisations (WEF,[39] World Bank, Ocean Panel, OECD) refer to the UN SDGs (2015) which serve as the basis for meeting the challenges of sustainability assessments. SDG 14 and its subsections are pivotal for issues directly related to aquatic resources. In particular, the World Bank and the United Nations have turned the requirements of SDG 14 into a major framework to ensure sustainability in the various activities of the

35 BESF (European Commission, 2021b; 2021c) proposed 148 indicators (44 shared across all sectors and 104 sector-specific).

36 https://bloomassociation.org/imposture-msc/

37 https://www.globalreporting.org/

38 https://greeneconomytracker.org/

39 https://www3.weforum.org/docs/WEF_Tracking_Investment_in_and_Progress_Toward_SDG14.pdf

Blue Economy (World Bank & UN DESA, 2017). Appendix 1 provides information that link Blue Economy activities with the corresponding SDG 14 sub-objectives, even going beyond SDG 14.7,[40] which has become fundamental for the sustainable Blue Economy. However, other SDGs are also taken into account, particularly SDGs 1, 3, 5, 6, 7, 8, 11, 12, 13, and 15 for the allocation of the World Bank's PROBLUE Fund (WorldBank, 2021).

In France, the initiative of the Fondation de la mer (Foundation for the Sea) proposes a label[41] called '**Ocean Approved**' as an Ocean-related benchmark for companies and especially corporate groups that give specific indicators regarding the application of SDG 14 (AFD, 2023a). The Sustainable Development Analysis and Opinion (SDAO) mechanism used by AFD is also based on this same principle of comparing projects against SDG indicators (Appendix 5, section AFD) (Figure 10).

The OECD's launching of a data platform to monitor the implementation of a sustainable Blue Economy (sustainable Ocean Economy/ sustainable Blue Economy) is worthy of interest (OECD, 2022 & 2023).[42] Monitoring indicators are compiled at the country level, and a comparison between countries can be carried out using each indicator. The following parts of country data are organised under several quantitative and qualitative indicators, which are used for the assessment:

- An estimation of natural marine capital, its status (for example, threatened species according to the IUCN Red List of Threatened Species™, urban development rates along the 10-km coastal strip, status of fish stocks),
- The state of marine and coastal socio-ecosystems and their resilience (forthcoming),

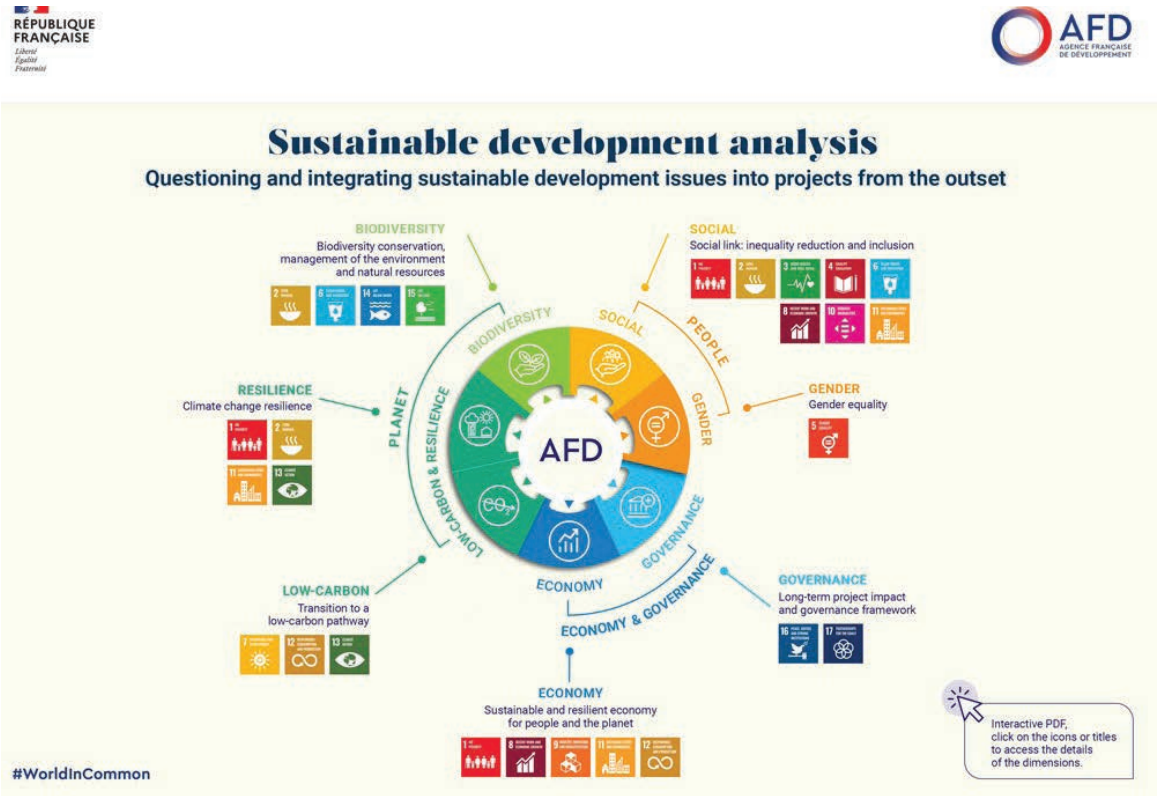


Figure 10 — Schematic diagramme of sustainable development analysis (recommended by AFD)
Source: AFD (2023b).

40 SDG 14.7: Increase the Economic Benefits from Sustainable Use of Marine Resources
41 https://oceanapproved.org/
42 https://www.oecd-ilibrary.org/sites/1f798474-en/index.html?itemId=/content/component/1f798474-en

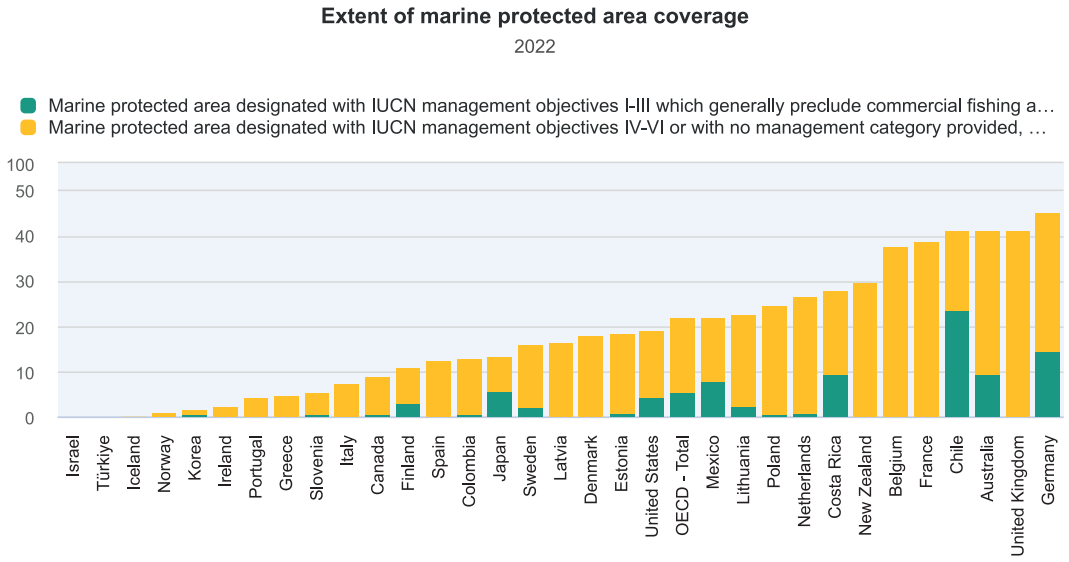


Figure 11 — The use of the indicator on the extent of marine protected area coverage

Source: OECD (2023, p. 15)

- The environmental impact of the exploitation of marine resources (GHG emissions per Blue Economy sector and total emissions),
- Economic opportunities to improve the sustainability of the sustainable Blue Economy (incentives for MRE, Blue Carbon, and resesach and development, among others),
- Legislative responses to the sustainability of the sustainable Blue Economy and their degree of application and efficacy (for example, the surface area of MPAs compared to the total EEZ, as a percentage (Figure 11), the number of laws or measures related to the Blue Economy, tax revenue related to the Blue Economy, and others), and
- The socio-economic context (based on the aspects usually accounted for in the Blue Economy).

UNECA has also published its own Blue Economy Valuation Toolkit (BEVT) and has recently implemented a Blue Economy monitoring grid in Tanzania (UNECA, 2023). According to BEVT, the economic analysis is based on added-value accounting in the various sectors of the Blue Economy in accordance with international standards. Financial assessments of marine and coastal ecosystems, lake areas, and wetlands are also included. A description of the governance arrangements associated with the Blue Economy is provided. An assessment of the Blue Economy from a social perspective is made based on indicators proposed by the UNDP and other international organisations (Table 2). The ADB and the World Bank also use their own assessment categories (Appendix 5). In particular, since 2018, the World Bank for its multi-donor PROBLUE[43] trust fund has been offering the Blue Economy Development Framework (BEDF), a visual tool[44] developed with Europe to fit sustainable Blue Economy development approaches on a country scale(World Bank, 2021).

43 https://www.worldbank.org/en/programs/problue

44 https://www.worldbank.org/en/programs/problue

Table 2 — Dimensions of the Blue Economy Valuation Toolkit and their data sources *Source: CEA (2023, p. 14)*

	DIMENSIONS ASSESSED IN THE BLUE ECONOMY VALUATION TOOLKIT (BETV)	INDICATORS USED
1	Any economic activities associated with Blue Economy	International Standard Industrial Classification (ISIC) Nomenclature (Revision 4)
2	Any social dimension of human interaction with Blue Economy	Indexes from UNDP (Human Development Indexes suchas Gini coefficient, Multidimensional Poverty Index, Gender Inequality Index, etc.), World Bank and from other internationally recognised organisations
3	Any ecosystem services related to the Blue Economy	Urban Nature Index IUCN Habitats Classification Scheme (version 3.1) to describe each relevant Ecosystem and Common International Classification of Ecosystem Services or CICES or Nomenclature (version 5.1)

3.7.3 Key performance indicators of regenerative Blue Economy

The regenerative Blue Economy, as considered in this report, builds on all previous work but goes a step further to propose original KPIs that report on the performance achieved, particularly with regard to the positive impacts on the health of the Ocean and its socio-ecosystems. The most detailed and complete report on these seems to be that of Systemiq (2022) which addresses the private sphere. Likewise, the ongoing work of the United Nations and the OECD is worth mentioning.[45]

Although it focused on identifying KPIs for start-ups and the development of the Ocean Impact Navigator (OIN), the Systemiq study (2022) analysed existing assessment frameworks and showed the need to move towards specific and aggregated indicators that can attest the positive impacts. The KPIs are grouped into six main types of positive impact (Figure 12), including a set of indicators with defined wording. For example, how much marine biomass will be preserved and restored by the solution proposed by a given start up project? How much carbon will be sequestered? The answer to these questions can sometimes be purely qualitative or require a calculation method that is not yet well defined in many cases.

This approach does not seem far from the specifications of the IUCN Global Standard for NbS™ (IUCN, 2020a), with an obvious advantage, for the OIN for example, of being clearly marine- and coastal ecosystem-oriented, and the limitation of its ability to be extended to SMEs, large corporations, sectors, or States, regions, or political strategies bearing a 'Blue Economy' stamp for a territory, which may need to be developed further

Other approaches will be directly related to specific assessments of Blue Carbon projects (Box 2), while also drawing inspiration from other benchmarks (such as the NbS) to integrate indicators related to good governance and social issues.

At the State-level, with projects or strategies put in place to develop a Blue Economy, it will probably be necessary to refer to the OECD's (2022) proposed approaches to move towards a sustainable Blue Economy by adding more specific criteria and demonstrating a commitment to a regenerative Blue Economy.

3.8 Academic research and the Blue Economy

In the same vein as the circular economy, the concept and multiple definitions which became widespread from the 2000s onwards under the impetus of the Ellen MacArthur

45 See AFD (2023) .

Foundation,[46]– even though the premise of a circular economy had already existed for a significant amount of time (le Gouvello, 2019) – it has mostly been public authorities, major international bodies, and associations that have actually promoted the Blue Economy, with abundant 'grey' documentation published online.

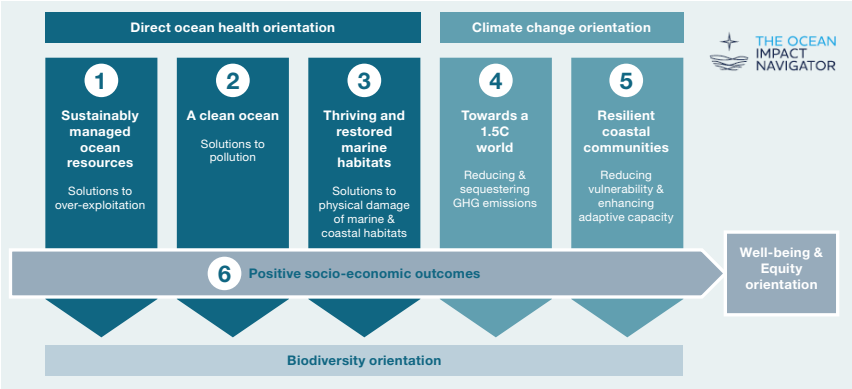


Figure 12 — Main (positive) impact areas for key performance indicators
Source: Systemiq (2022, p. 33)

It seems that the academic sphere likened the work on the Blue Economy to previous academic work in marine sciences, economics, and maritime economics in particular. In this latter case, the economic research focused mostly on 'how to measure', such as on methodological research on existing or emerging sectors of the marine economy, which led to numerous studies among a specialised group of economists (le Gouvello, 2016) (Boxes 6 and 7; Figures 13, 14 et 15).

This was followed by all the research associated with sustainability science in each sector of the marine economy and humanities, with a focus on legislative and regulatory instruments, and subsequently by research in environmental economics and ecology related to the recognition of services rendered by marine and coastal ecosystems such as the EFESE project (European Commission, 2022; Mongruel et al., 2019). More recently, all research on the impacts of climate change in marine and coastal socio-ecological systems, protection, and forecasting models have also come from an academic sphere associated with the Blue Economy (Claudet et al., 2022; Gaill et al., 2022).

The Blue Economy has become itself an object of scientific research since the 2000s (Figures 16, 17a and 17b), but a clear increase in publications can be seen from 2015 to 2016. This publication work pursues multiple perspectives of study. Some examples of recent references are listed below (by topic, and non-exhaustive):

- **Critical thinking on the true capacity of the Blue Economy to renew the existing model, integrate climate emergencies, and truly protect marine and coastal biodiversity**: Barbesgaard, 2018; Cisneros-Montemayor et al., 2021; Claudet, 2021; Claudet et al., 2022; Gaill et al., 2022;
- **Criticism of the societal and social challenges of the Blue Economy, which are inadequately taken into account in the proposals made by governments, economic players, and decision makers; including criticism and proposals on governance**: Bennett et al., 2019, 2021 & 2022; Benzaken et al., 2022; Cisneros-Montemayor et al., 2019; Farmery et al., 2021; Hoegh-Guldberg et al., 2019; Morgan et al., 2022; Niner et al., 2022; Voyer and van Leeuwen, 2019; Voyer et al., 2018 & 2022; Winther et al., 2020;
- **Analyses of the concept and definitions**: Eikeset et al., 2018; Keen et al., 2018; Smith-Godfrey, 2016; Vierros, 2021; **scope**: Lee et al., 2021; Schutter et al., 2021; **links to existing concepts such as ecological economics**: Keen et al., 2018; **inclusive economics**: travaux de Bennett et al.; Voyer et al; **emerging Blue Carbon**: Steven et al., 2019; **and NbS**: Hughes, 2021;

46 https://ellenmacarthurfoundation.org/

Box 6 — Global Blue Economy figures are difficult to interpret and compare

Various scientific reports and journals estimate a GDP for the marine economy at the global level, all while emphasising how difficult it is to obtain accurate estimates. As the recent French report (Kalaydjian & Bas, 2022a) points out, accounting in the various sectors of the marine economy (or the 'brown' Blue Economy) is not very clear in its methodology to begin with. The OECD estimated that around US$ 1.5 trillion of global GDP is linked to the ocean (OECD, 2016) and forecast that this would reach US$ 3 trillion by 2030 (OECD, 2016). The WWF (015) and Ocean Panel (Stuchtey et al., 2020) reports gave an estimated US$ 2.5–3 trillion for the current global blue GDP, while a recent Citigroup report indicated a range between US$ 1.5 and 6 trillion (Citi GPS, 2023). For scale, national GDP linked to the sea is rather low, at around 1–4% in industrialised countries (except for cases such as Norway), although the blue GDP can exceed 50% of national GDP in some States (especially island States) (OECD, 2020).

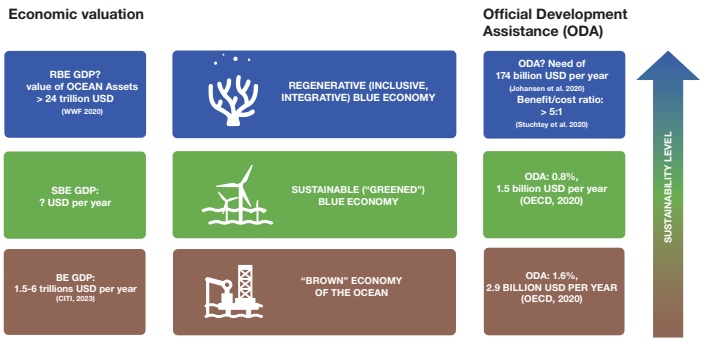


Figure 13 — The uncertainty of numerical data relating to the Blue Economy, sustainable Blue Economy, and regenerative Blue Economy *Source : Authors from sources indicated*

The methodology applied in each such report must be re-examined in detail before an estimate of the current GDP of a sustainable Blue Economy can be very carefully extracted. As for the estimate of the GDP related to the regenerative Blue Economy, it seems difficult to quantify a not-yet-established sector. The WWF estimates the value of marine and coastal ecosystems at US$ 24 trillion, a figure echoed in the Citigroup report (Citi GPS, 2023).

In terms of investments, Official Development Assistance, and funding requirements for compliance with SDG 14 and the scope of a sustainable Blue Economy, the Ocean Panel (Stuchtey et al., 2020) carried out cost-benefit analyses for returns on investment, proposing a ratio of 5:1. This same Ocean Panel report based data on the IPCC report (Pörtner et al., 2019) and put the cost of ocean inaction, for 2050 and 2100, at US$ 428 billion and 1.98 trillion, respectively.

Johansen and Vestvik (2020) estimated the annual investment needed for the Ocean's health at nearly US$ 175 billion. The World Bank reports an overall portfolio of US$ 9 billion of investments in Ocean activities (World Bank, 2021). For the OECD (2020), however, which applied its methodology for estimating ODA to a Blue Economy/sustainable Blue Economy setting (see Assessment of Official Development Assistance in section 3.7), what is actually happening is still very far from these needs; ODA directed towards the Blue Economy currently represents only 1.6% (US$ 2.9 billion) of total assistance, with ODA directed towards the sustainable Blue Economy representing just half of that (0.8% of total assistance, USD 1.5 billion). Where, then, would that leave ODA directed towards a regenerative Blue Economy?

There is a clear need for research to define and establish a framework for suitable estimates of what the added value of a regenerative Blue Economy might be today and what it might represent in the future. Nevertheless, given the uncertainties already identified in estimates of the economic weight of the Blue Economy and the sustainable Blue Economy, it will also be necessary to clarify what all these sectors are, alongside their scopes, methods, etc. The coalition initiative of the Global Ocean Accounts Partnership is included in this essential agenda to drive progress on the bue economy, sustainable Blue Economy, and regenerative Blue Economy, focusing on aspects other than merely numerical data. Similarly, most of the organisations that have proposed principles for a sustainable Blue Economy framework have stressed the need to produce scientifically sound, rigorous, and transparent data (Figure 15) (see also Appendix 2).

Box 7 — Assessment of Official Development Assistance

The OECD (2020)*, in its report on implementing the Blue Economy in emerging countries co-authored with other players in development, proposed several implementation levels to structure a Blue Economy programme or project, such as Official Development Assistance (ODA) that falls within the scope of the Blue Economy or sustainable Blue Economy. The report focuses on which actions fall under the Ocean Economy (or Blue Economy), Sustainable Ocean Economy (or sustainable Blue Economy), and land-based activities that impact the sea (Figure 14). Official Development Assistance is categorised by typology and indicators. (Figure 14).

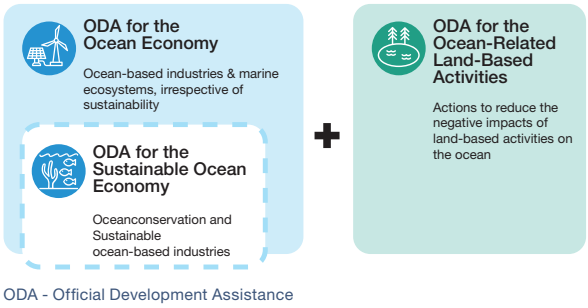


Figure 14. Three key indicators to track ocean-relevant ODA *Source: OECD (2020, p. 1)*

This assessment showed that very little ODA is directed to the Blue Economy (1.6% of total assistance), and even less to the sustainable Blue Economy (0.8% of total assistance). In contrast, the report highlighted that 11% of the GDP of some developing economies results from maritime activities (compared to around 2% for developed economies). Some sectors (for example, tourism) can reach 20% of GDP (Figure 15).

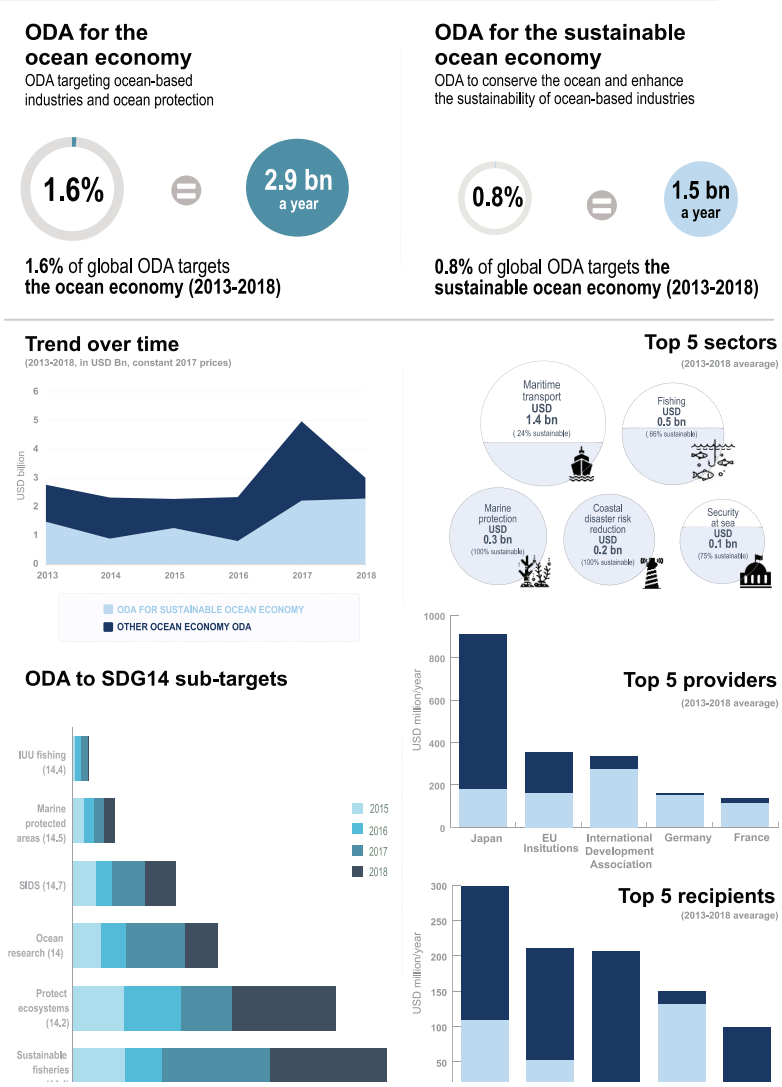


Figure 15 — Key figures on ODA for the ocean economy and ODA for the sustainable ocean economy (2013–2018)
Source: OECD (2020, Figure 4.1, p. 113)

* For more information, please see: https://doi.org/10.1787/bede6513-en.

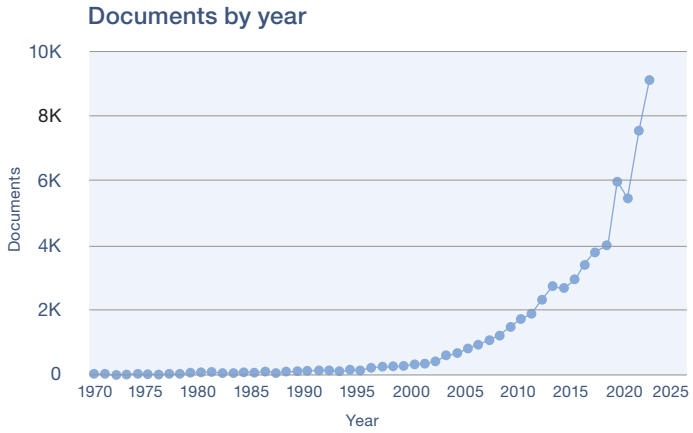


Figure 16 — Number of publications on the Blue Economy, between 1970 and 2022 *Sources: Authors, based on the database Scopus (2023) (consulted on 26 April 2023; Key words used: Blue AND economy, with a total of 64,347 results, 1970–2022)*

- **Regional socio-economic and environmental analyses of policies and instruments to implement the Blue Economy at the country or regional level**: Bond, 2019; Wenhai et al., 2019; Okafor-Yarwood et al., 2020; Benzaken et al., 2022; Morgan et al., 2022; Voyer et al., 2022; March et al., 2023; Pouponneau, 2023;

- **Research on indicators, measures for the Blue Economy, and sustainability assessments**: Cisneros-Montemayor, 2019; Niner et al., 2022;

- **Research and thoughts on financing methods and their ethics, the emergence of blue bonds**: Sumaila et al., 2020; Sumaila et al., 2021; Bosmans and de Mariz, 2023; and **specific examples related to Blue Carbon**: Steven et al., 2019.

Multidisciplinary research in the accepted major sectors of the Blue Economy now offers research agendas that combine sustainability science in the relevant sector with a link to the Blue Economy, such as Hughes (2021) on aquaculture, NbS, and the Blue Economy.

Several schools of thought have adopted the field of study that has now become the Blue Economy, including the following:

- In Australia, Benzaken et al. and Voyer et al.;

- In the USA, the Center for the Blue Economy (CBE) (Colgan et al.);

- In Canada, the University of Vancouver (Bennett & Sumaila);

- In Asia, there are many academic centres, the main players of which can be found in Morgan et al. (2022);

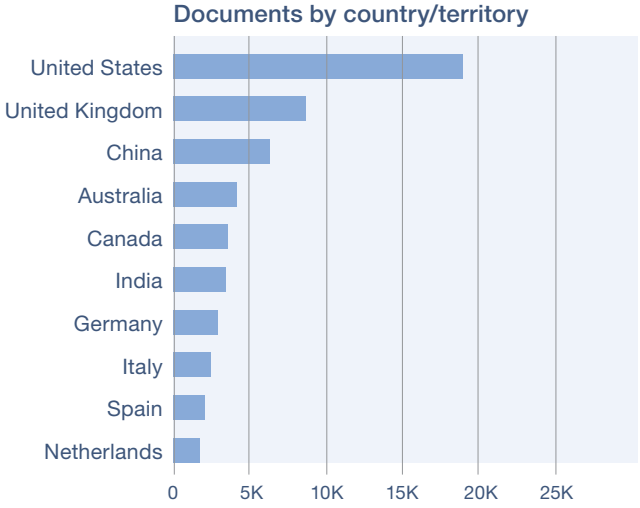


Figure 17a — Number of publications by country

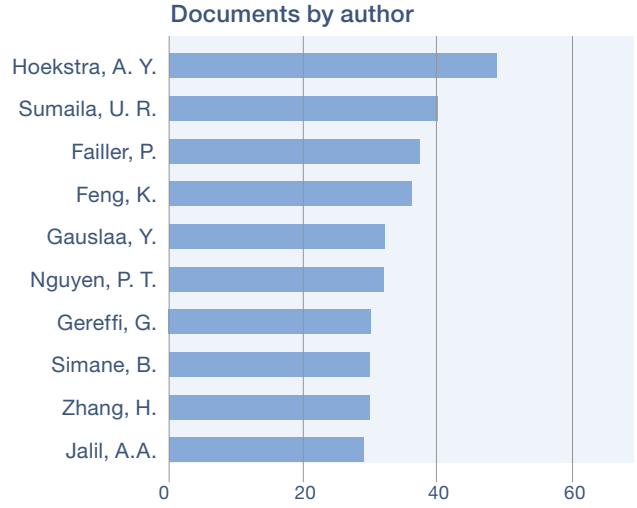


Figure 17b — Number of publications by author

Sources: Authors, based on the database Scopus (2023) (consulted on 26 April 2023; Key words used: Blue AND economy, with a total of 64,347 results, 1970–2022)

- In Europe (enlarged EU), many research institutes have shown interest in the Blue Economy, especially in the Netherlands, the United Kingdom, and Norway;

- In France, the mixed research unit AMURE (UBO-Ifremer), pursuing its mission of producing economic data on the marine economy, has taken an interest in the Blue Economy, focusing on socio-environmental and legal research.

Vierros (2021) emphasises the need for research in political science, environmental (Ocean) science, and human and social sciences. A multidisciplinary approach to the Blue Economy is needed. Research on marketing, technology, and innovation is also essential – without neglecting anthropological and ethnographic work, which is essential to highlight traditional knowledge and cultural heritage.

3.9 Connections with other approaches

3.9.1 With circular economy and regenerative economy

For many stakeholders, such as the UN Economists Network (UNEN) (Davies & Vauzelle, 2023), UNEP, UNGC (2020), and G20 (Appendix 2), the circular economy and the Blue Economy must be combined in the principles of a sustainable Blue Economy. The circular economy was included from the outset in the WWF's definition of the Blue Economy in 2015 (Appendix 1). The call for a circular economy approach is likewise reflected in the IUCN's 2020 resolution on the need to reduce plastic waste (Appendix 5, IUCN section).

The Blue Economy must be circular in nature, encompassing the principles and tools of the circular economy as promoted by public decision-makers, NGOs, and economic decision-makers. However, as with the Blue

Bouchot mussels farming, Brittany, France (Photo: R. le Gouvello)

Economy, the exact model of the circular economy in question must be clearly defined in advance for it to be linked with the Blue Economy. The principles laid out by UNEP (2021) and G20 (Appendix 2) specify the objectives of a circular economy to ensure that the term is not reduced to plastic waste management alone (Davies & Vauzelle, 2023).

As with the Blue Economy, albeit in a more developed way, the goal of the circular economy, its scope, implementation, and tools, and the sustainability assessment of the chosen system are the subject of much research (le Gouvello, 2019). It will therefore be important to go further to deepen the links between the circular economy and the Blue Economy/sustainable Blue Economy/ regenerative Blue Economy. Similarly, further examination is also required for the scope of the regenerative economy concept, such as 'regenerative sustainability', 'regenerative development', 'regenerative design', which are all closely linked to a circular economy according to some authors (Gibbons, 2020; Mang & Reed, 2020).

3.9.2 With bioeconomy

The Blue Economy is closely linked to 'bioeconomy'. However, the meaning currently ascribed to bioeconomy is not that of the concept of defined by the bioeconomist school of the 1970s–1990s, famously advocated for by Georgescu-Roegen and Passet (Georgescu-Roegen, 1971; Passet, 1982). Bioeconomists like Georgescu-Roegen belonged to the same school of thought the Meadows Report (1972), which recognised that resources were finite and that growth has its limits (Le Clanche & Folliard, 2011).

The meaning given to the blue bioeconomy by Europe or the FAO is part of a new form of public action dating back to the late 1990s (Delgoudet & Pahun, 2015).

Bioeconomy is defined as:

> *. . . the economy of biomass and/or biotechnology, i.e., an economy that derives i*ts growth from the exploitation of life and meets the energy and material needs of human populations through the development of plant-based or biobased chemistry. The bioeconomy thus intends to replace the use of oil with n*atural resources or bioresources in order to produce bioenergy (biofuels), biomaterials (timber, composite materials), or biobased products (bioplastics, solvents, cosmetics, etc.)* (Pahun et al., 2018, p. 5).

It is firmly associated with technical progress and the development of biotechnologies, which Europe is committed to in agriculture sector (Bell et al., 2018; Lainez et al., 2018). The 'blue' component of this bioeconomy relates strictly to the development of an economy based on marine bioresources, such as the economy of fishing and aquaculture as defended by the FAO (2021), a conventional or emerging blue bioeconomy based on all innovations for the processing of fishing and aquaculture products and by-products, or the extraction of new marine compounds (Riou et al., 2019).

However, the FAO report (2021) proposes a wider definition of the bioeconomy, which includes all sciences and activities related to the regeneration of living biological resources, thereby quoting the Global Bioeconomy Summit.[47]

The bioeconomy is also circular when it strives to innovate on how to bring value to by-products and co-products of agriculture, fishing, and aquaculture (Lokesh et al., 2018; Nekvapil et al., 2019; Riou et al., 2019).

At the same time, bioeconomy does not necessarily fit into a clearly defined sustainability framework, as the examples of agriculture, fishing, and aquaculture have shown. Each blue bioeconomy project must be evaluated to be included in sustainability specifications, as proposed by the FAO in 2021 in its statement of 10 Principles and Criteria for a Sustainable Bioeconomy. The wording of this statement is similar to the principles published for the Blue Economy (FAO, 2021).

3.9.3 With social and solidarity economy and care economy

The UNEN (Davies & Vauzelle, 2023) explicitly associated the Blue Economy with the social and solidarity economy (SSE) and care economy, both of which are the subject of much research to define their nature, principles, applications, and legislative measures. Additional analytical work is therefore required as regards the link with the issues surrounding inclusion and fairness discussed in preceding sections with respect to the Blue Economy.

47 "The bioeconomy can be defined as the production, utilization, conservation, and regeneration of biological resources, including related knowledge, science, technology, and innovation, to provide sustainable solutions (information, products, processes and services) within and across all economic sectors and enable a transformation to a sustainable economy" (FAO, 2021, p. 4).

3.9.4 With Nature-based Solutions

The foundations and principles of the NbS are in line with the potential vision of a regenerative Blue Economy, which prioritises ecosystem approaches and the conservation and restoration of natural capital and ecosystems (Cohen-Shacham et al., 2016; Cohen-Shacham et al., 2019). The assessment framework for the Global Standard as proposed by the IUCN (2020a; b) provides a structure that seems to be an already very comprehensive way to address the various issues of the regenerative Blue Economy discussed in the preceding sections.

IUCN Resolution 031 (WCC-2020-Res-031) proposes NbS as a future pillar and essential tool for the implementation of a sustainable Blue Economy around the Mediterranean Sea. The BNCFF uses the Global Standard for NbS™ to evaluate Blue Carbon projects (see Box 2). Hughes (2021) suggests that applying the NbS framework to aquaculture is an opportunity to make the sustainable Blue Economy concept more feasible (Hughes, 2021). Le Gouvello et al. present concrete examples of the Global Standard for NbS™ as applied to aquaculture, supported with case studies about improved sustainability and alignment with the concept of regenerative Blue Economy (le Gouvello et al., 2023).

Consequently, the link between the IUCN Global Standard for NbS™ and the definition of the regenerative Blue Economy clearly warrants further examination. Certain activities and sectors of the regenerative Blue Economy, such as MRE, and some aquaculture production systems, such as low- or no-carbon maritime transport, do not fall under the definition of NbS, even if they are or will be implemented in such a way as to serve as an example. Nevertheless, this proposed framework involving the Global Standard for NbS may allow these activities to be assessed in the context of a regenerative Blue Economy strategy.

At this stage, it seems important for synergies and connections between the concept and tools of the NbS and those of the regenerative Blue Economy be explored further.

3.10 Implementation

Implementing the Blue Economy, sustainable Blue Economy, or regenerative Blue Economy has multiple layers on which operational methodological choices will depend :

- The supra-national level,
- The national level,
- The sub-national level,
- The sector level,
- The company level.

This section focuses on the implementation of a Blue Economy at a coastal territory, regional, national, or supra-national level.

Implementing the Blue Economy at a company level considers the eligibility criteria and performance examined for companies and sectors in section 3.7 on “Assessment and indicators”.

The Ocean Panel report (Stuchtey et al., 2020) is aimed at policy makers and national and international organisations, and proposes broad packages of priority actions to guide development towards a sustainable Blue Economy, or even a regenerative Blue Economy. It underlines the need to create reliable, accessible, and long-lasting databases. Lobmüller and Lieberknecht (2021) echo the sustainable Blue Economy transition process as proposed by UNEP in 2021. More recently, UNDP (2023) has described a progressive approach to the transition of SIDS towards a sustainable Blue Economy, based on the ‘sustainable Blue Economy governance wheel’

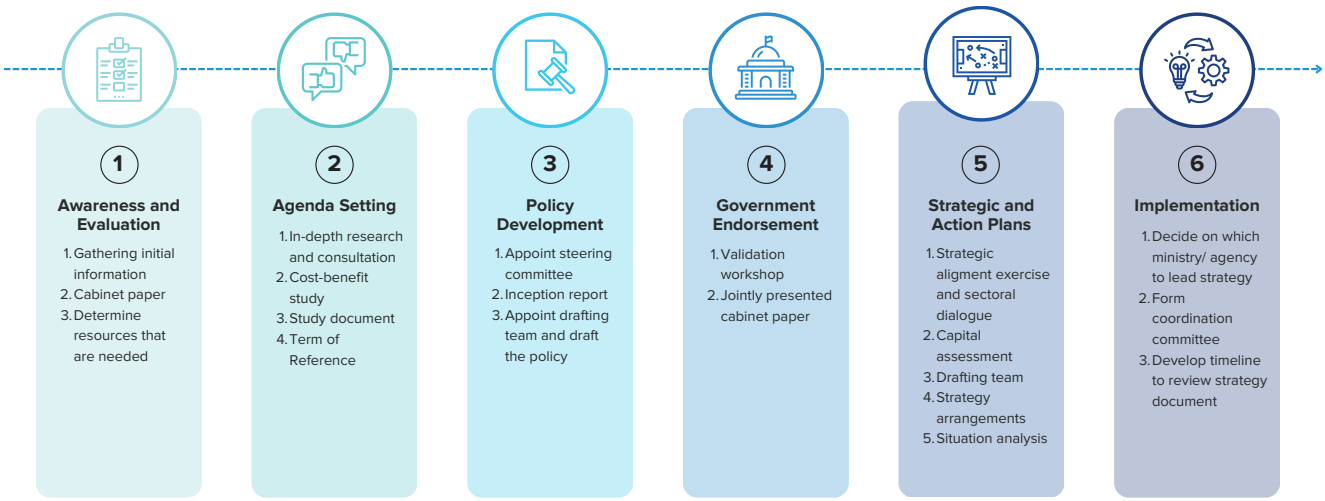


Figure 18 — A step-by-step approach for Small Island Developing States *Source : UNDP (2023, p. 27)*

which involves all-stakeholder consultations, the use of MSP, incentives, and others (see Figures 18 and 19).

Regardless of the approach, all rely on the usual methods of on-the-ground analysis, which requires a prior review of the socio-economic, governance, socio-ecological, and stakeholder relationship systems in place with a view to developing a collaborative project and consequently an action plan. The recommended approach is participatory, so it must be led by a coalition of active stakeholders and leaders. In most cases, it will be led by a government, which seems to be the most appropriate authority to implement a strategy, especially if regulatory incentives are required. That being said, a coalition of private stakeholders or members of civil society (associations) could also be proponents of the approach.

Respecting the sovereignty of each country is paramount. Proposed methodological approaches, such as that proposed by the UNDP (2023) for SIDS, serve as guides. However, it is commonly accepted that each country will develop its own Blue Economy – or sustainable Blue Economy – project by defining its own vision of the Blue Economy. In fact, the recent example given by SIDS shows that the notion of a Blue Economy can vary from one SIDS to another due to their diverse contexts (Pouponneau, 2023).

Nevertheless, the challenges related to the Ocean go well beyond national (and EEZ) borders, which suggests that a regional approach by regional Ocean (for example, an approach for the Indian Ocean, one for the Pacific Ocean, the Mediterranean Sea, etc.) (Hassanali, 2020) will also be very relevant; such an approach is already being applied in some regions of the world (see Appendix 5).

At the national level of a Blue Economy project, the degree of government involvement can already be assessed by answering the following questions or adjusted to fit the scope described in the preceding sections:

- Has the country defined the Blue Economy, implemented a Blue Economy strategy, and if so, since when?

- Does a ministry for the Blue Economy exist or not? What is its scope of intervention and hierarchy within the government?
- What are the relevant legal instruments?
- What are the vision, principles, scope, and key sectors of this Blue Economy?
- What financial instruments are used? What means are allocated?
- What is the agenda, and what actions are being taken? What are the quantified objectives and the monitoring indicators/ dashboards?

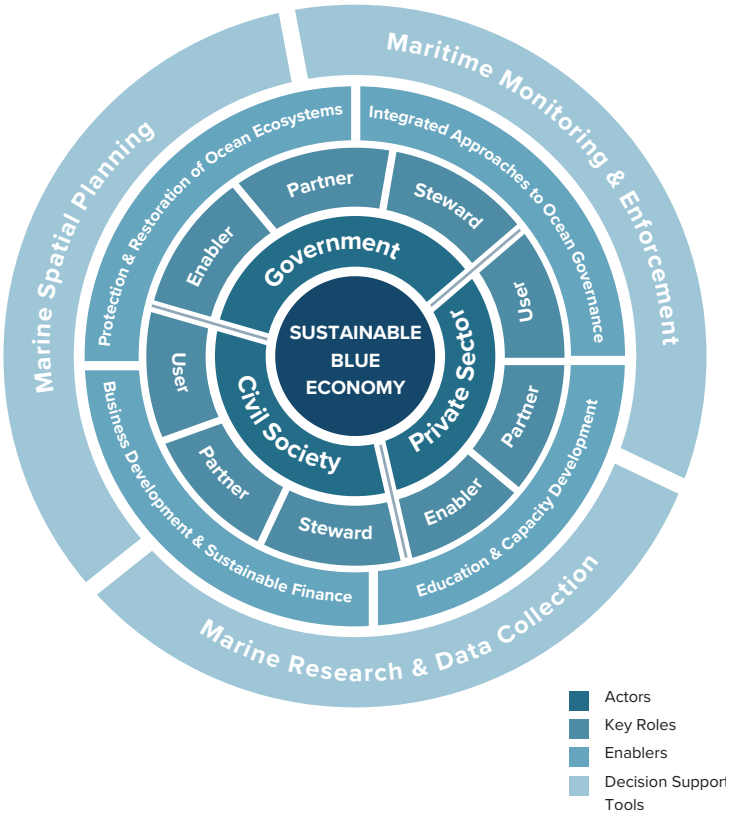


Figure 19 — The sustainable Blue Economy governance wheel *Source: UNDP (2023, p. 14)*

Conclusion

Despite the many discussions around the definition of the Blue Economy, the need for a defined framework and strong and clear principles for the Blue Economy, or rather, for a regenerative Blue Economy, has been clearly demonstrated in this mapping effort.

The next decision is whether to commit and propose a **regenerative Blue Economy** or to call for an inverted term, a **blue Regenerative Economy**. The nuance matters. The first proposal primarily promotes an approach in line with the general discussions around the Blue Economy as described in this report.

Conversely, the second proposal implies breaking away from established discussions by introducing a new concept, the 'blue Regenerative Economy', which adds a 'blue' dimension to the emerging trend of a Regenerative Economy based on coastal and marine natural capital and inspired too by the Nature+ objectives of the Kunming-Montreal Global Biodiversity Framework (Gibbons, 2020; UNEP, 2021) (Figure 20).

As emphasised by Claudet (2021), the 'Ocean's health' is a clear priority. It must be at the heart of all Blue Economy strategies to the same extent as the challenge of an inclusive Blue Economy rooted in solidarity, both at the level of each coastal State and between all States, island nations or continental countries – with or without a coastline.

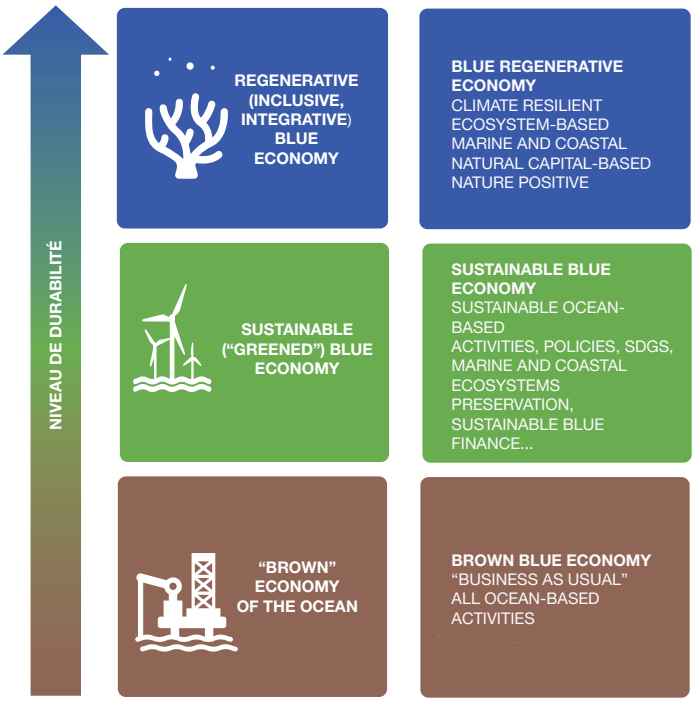
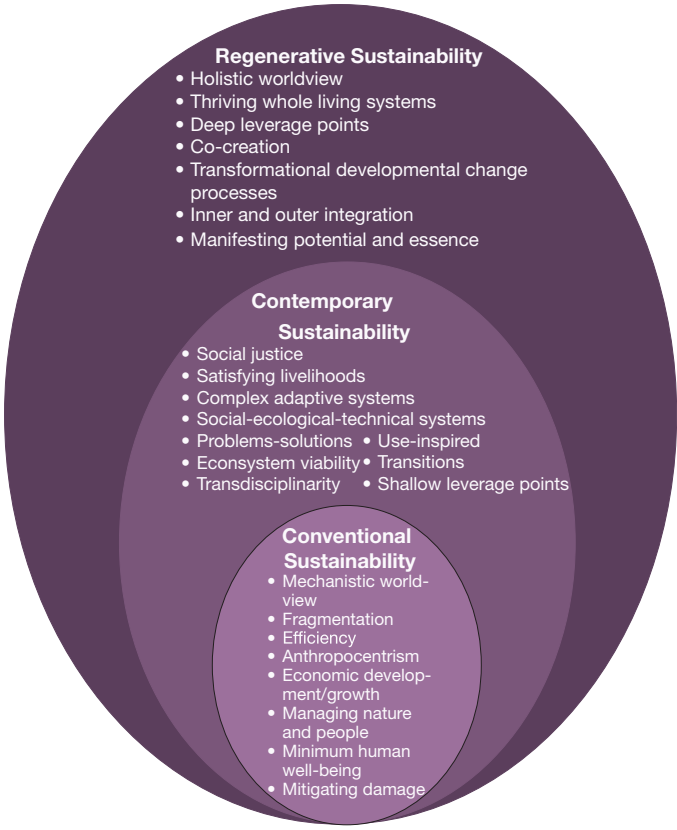


Figure 20 — Moving toward a regenerative blue economy
Source: Authors & Gibbons (2020, p. 4)



Based on sustainability paradigms (Gibbons, 2020)

This joint approach is critical because, in reality, there is only one Ocean – a single, continuous entity that plays an essential role in regulating the climate and supporting biodiversity. Yet, it is also threatened by climate change, varying sources of pollution – very often from land – and the overexploitation of marine resources. The combined impact of these effects endangers the large part of humankind that lives near a coast. The vision, framework, and interpretation ascribed to the Blue Economy is therefore a universal issue.

In other words, in this period of the United Nations Decade of Ocean Science for Sustainable Development (2021–2030), it would appear vital, even indispensable, that the IUCN make a stand on its vision for the Blue Economy, one that can be proposed as a motion at the next IUCN World Conservation Congress.

Given the diverse interpretations of the Blue Economy and its consequently diverse implementation around the world (see Appendix 5 for a more detailed overview), the development of this motion and its adoption as a resolution will be a challenging exercise.

Based on the IUCN's approach to NbS, a fairly concise definition could be formulated, where each word and its position counts. Then, the focus can shift to a statement of key founding principles.

In this regard, the one proposed by Systemiq (2022)[48] for the launch of the Ocean Impact Navigator, with the support of key figures at Ocean Panel (Peter Thomson, in particular), could be used as a basis for the definition:

> *A regenerative blue economy* [or blue regenerative economy] *is an economic model that combines rigorous and effective regeneration and protection of the Ocean and marine and coastal ecosystems with sustainable, low- or no-carbon economic activities and fair prosperity for people and the planet, now and in the future.*

Compared to the World Bank's 2017 definition,[49] the advantage of this definition inspired by Systemiq (2022) lies in its prioritisation of the environment, followed by socio-economic issues. The most recent UNDP (2023)[50] definition remains highly centred on economic development derived from exploiting marine resources, while ensuring fair, inclusive growth, and the conservation of marine and coastal ecosystems.

Nevertheless, the regenerative Blue Economy, while integrative and inclusive, is still poorly defined in its scope, principles, implementation, and performance assessment. The respective principles and scopes of the Blue Economy, sustainable economy, and regenerative Blue Economy, which are still flexible, depend on the advocated definitions, principles, and goals, with varying levels of sustainability requirements and priority objectives. The need for consistency across the respective definitions, principles, scopes, and performance assessments of Blue Economy, sustainable economy, and regenerative Blue Economy would seem even more justified given the recent and exponential development of research on the Blue Economy.

48 "A sustainable ocean economy is one that combines rigorous and efficient ocean regeneration and protection, sustainable production, and equitable prosperity to serve people and the planet, both now and in the future" (Systemic, 2022, p. 13)

49 "The Blue Economy: The sustainable use of ocean resources for economic growth, improved livelihoods and jobs while preserving the health of the ocean." (World Bank, 2017)

50 The UNDP, therefore, encourages the adoption of the sustainable Blue Economy concept, defined as "the sustainable use of ocean resources for economic growth, jobs and social and financial inclusion, with a focus on conservation and restoration of ocean ecosystems and the services they provide" (UNDP, 2023, p. 2).

As far as principles are concerned, the founding principles for a regenerative Blue Economy already seem evident. The broad themes would be:

- The protection, restoration, resilience, and regeneration of marine and coastal ecosystems, marine resources, and natural capital as priorities. Combating climate change and biodiversity losses is included in this priority. The precautionary principle is applied when the impacts of an activity on marine and coastal ecosystems are still poorly understood. The ecosystem approach must be applied.

- The economic system set up around the regenerative Blue Economy must prioritise inclusion, fairness, and solidarity, as well as guarantee the well-being and resilience of impacted populations, and reduce their vulnerability to climate change. It must be economically sustainable and supported by responsible sources of funding that subscribe to these same principles.

- The regenerative Blue Economy must have an inclusive and participatory governance system, with a transparent approach for reliable, scientifically grounded assessments. The system must be flexible, with ad hoc legal and regulatory instruments, and integrated into supranational or even global priorities (or for example, 'mainstreamed'), as well as international agreements and commitments on climate change, and the conservation of biodiversity.

- The regenerative Blue Economy must comprise low- or no-carbon activities with a positive impact on the regeneration of marine and coastal ecosystems and the well-being of local populations. It must follow the principles of a sustainable circular economy by conserving marine resources and minimising waste.

- The regenerative Blue Economy must be implemented as a priority in island States with specific requirements. It must take into account the needs of coastal populations, Indigenous peoples in particular, and recognise their traditions (see Principle 9, G20, Appendix 2).

Sunset on the Indian Ocean (Photo: F. Simard)

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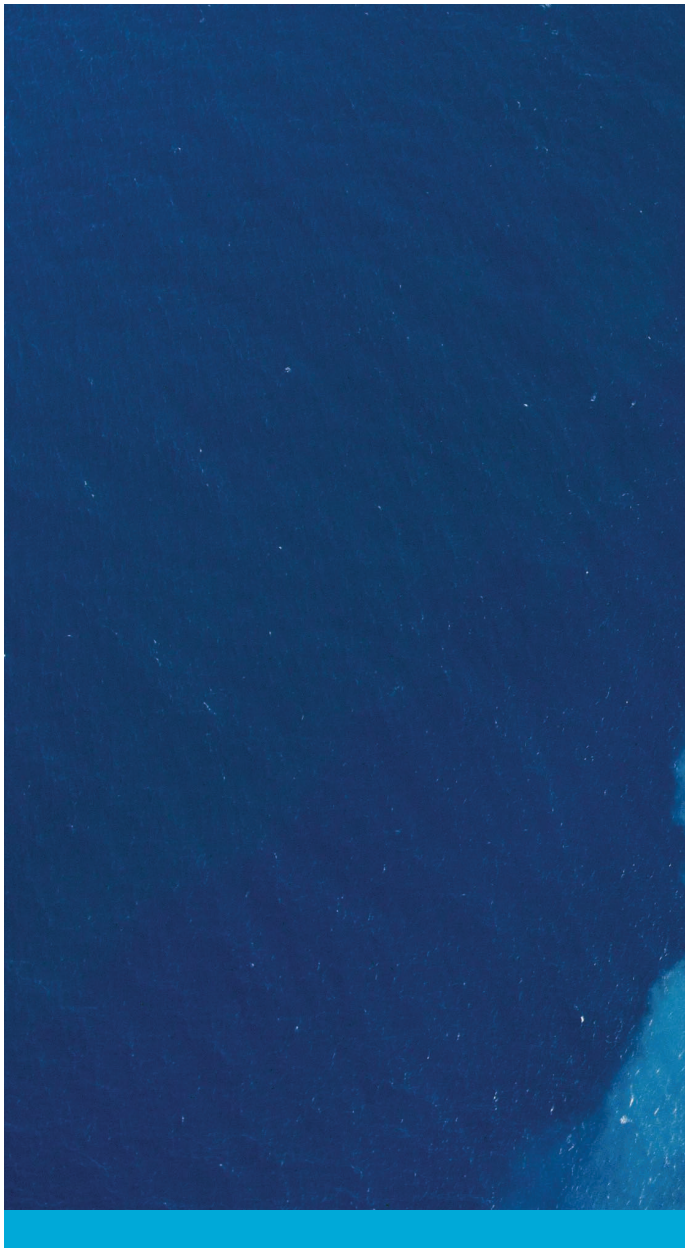
Appendices

A portfolio of unedited appendices can be accessed through this link:
https://www.iucn.org/sites/default/files/2024-03/annexes_appendices_mapping_blue_economy.pdf



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