# Ocean Decade

# Vision 2030

## White Papers

## Challenge 4:

## Develop a sustainable and equitable ocean economy

The United Nations
Decade of Ocean Science
for Sustainable Development
**(2021-2030)**

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

Published in 2024 by the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization

7, place de Fontenoy, 75352 Paris 07 SP, France





For bibliographic purposes, this publication should be cited as follows:

Haugan, P., Rhodes, A., Hollaway, L., James, P., Abdul Rahman, M., Appiott, J., DeBeauville-Scott, S., Gelcich, S., Gericksky, E., Gonzales-Quiros, R., Harms, E., Heaps, L., Hospes, E., Jeremie, M.-M., Jumbe, A. S., Kostka, W. N., Mokenye, J., Noonan-Birch, R., Park, G., Solis Rivera, V. & Thiele, T. (2024). *Ocean Decade Vision 2030 White Papers – Challenge 4: Develop a Sustainable and Equitable Ocean Economy.* Paris, UNESCO-IOC. (The Ocean Decade Series, 51.4.). https://doi.org/10.25607/2452-1r10

Graphic design: UNESCO

(IOC/2024/ODS/51.4)

# Ocean Decade Vision 2030 White Papers

## Challenge 4: Develop a sustainable and equitable ocean economy

*Generate knowledge, support innovation and develop solutions for equitable and sustainable development of the ocean economy under changing environmental, social and climate conditions.*

# Writing Team

The Intergovernmental Oceanographic Commission (IOC) of UNESCO, extends its sincere appreciation to the co-chairs and members of the Working Group for their leadership and commitment in the process of drafting and authoring the present document.

**Co-chairs**

| | |
|---|---|
| Peter Haugan | Institute of Marine Research (IMR) |
| Andrew Rhodes | Innovaciones Alumbra |

**Working Group expert members**

| | |
|---|---|
| Muhsina Abdul Rahman | Ministry of Climate Change, Environment and Energy, Republic of Maldives |
| Joseph Appiott | CBD Secretariat |
| Susanna DeBeauville-Scott | Organisation of Eastern Caribbean States (OECS) |
| Stefan Gelcich | Instituto Milenio en Socio-ecologia Costera, Pontificia Universidad Catolica de Chile |
| Erik Gericksky | UN Global Compact |
| Rafael Gonzales-Quiros | Instituto Español de Oceanografía - Consejo Superior de Investigaciones Científicas (IEO-CSIC) |
| Erika Harms | Grupo Iberostar |
| Louise Heaps | WWF |
| Elizabeth Hollaway | University of New South Wales (UNSW) |
| Emma Hospes | Ørsted |
| Phil A. S. James | University of New South Wales (UNSW) |
| Marie-May Jeremie | Seychelles Conservation and Climate Adaptation Trust and Western Indian Ocean Marine Science Association |
| Aboud S. Jumbe | Ministry of Blue Economy and Fisheries |
| William N. Kostka | Pacific Community |
| Joel Mokenye | African Union - Inter-African Bureau for Animal Resources (AU-IBAR) |
| Ronnie Noonan-Birch | Ocean Frontier Institute |
| Georgia Park | The Royal Society |
| Vivienne Solis Rivera | CoopeSoliDar R.L. |
| Torsten Thiele | Global Ocean Trust |

# Contents



# Acronyms

| | |
|---|---|
| FPIC | Free, Prior, and Informed Consent |
| IOC | Intergovernmental Oceanographic Commission |
| IPLC | Indigenous People and Local Communities |
| IUU | Illegal, Unreported, and Unregulated |
| NGO | Non-Governmental Organization |
| OECD | Organisation for Economic Co-operation and Development |
| SIDS | Small Islands Developing States |
| UN | United Nations |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |

# 1. EXECUTIVE SUMMARY

## 1.1 Introduction and Scope of the White Papers

This White Paper has been prepared as part of the Vision 2030 process being undertaken in the framework of the UN Decade of Ocean Science for Sustainable Development. The Vision 2030 process aims to achieve a common and tangible measure of success for each of the ten Ocean Decade Challenges by 2030. From a starting point of existing initiatives underway in the Ocean Decade and beyond, and through a lens of priority user needs, the process determines priority datasets, critical gaps in science and knowledge, and needs in capacity development, infrastructure and technology required for each Challenge to ensure that it can be fulfilled by the end of the Ocean Decade in 2030.

The results of the process will contribute to the scoping of future Decade Actions, identification of resource mobilisation priorities, and ensuring the ongoing relevance of the Challenges over time. The process identifies achievable recommendations that can be implemented in the context of the Decade, or more broadly before 2030 to achieve the identified strategic ambition and indicators that will be used to measure progress.

This White Paper is one of a series of ten White Papers all of which have been authored by an expert Working Group. Accompanied by an Outcomes Report authored by the Decade Coordination Unit, this White Paper was discussed at the 2024 Ocean Decade Conference before being finalised and published.

## 1.2 Strategic Ambition of Ocean Decade Challenge No. 4

By 2030, success for Ocean Decade Challenge No. 4: Develop a sustainable and equitable ocean economy, will be marked by significant advancements in establishing a knowledge-driven framework for informed decision-making and policy formulation. There will be enhanced collaboration among stakeholders, ensuring diverse community engagement and equitable benefit sharing while acknowledging and prioritising the culture, identity, and rights of IPLC that have historically depended on and thrived alongside ocean resources. Strategic mobilisation of blue finance will support investments in sustainable coastal and marine infrastructure, innovative technologies, and conservation efforts, reinforcing the economic foundation. Key policies and governance frameworks promoting sustainability and equity will be in place, alongside a balanced and reflective approach, laying the groundwork for a resilient and inclusive ocean economy. This success will be underpinned by improved data accessibility and capacity-sharing efforts, fostering a shared understanding and commitment to sustainable ocean use.

Success will include fulfilment of the following critical science and knowledge gaps: addressing the interface between knowledge systems, policy implementation, and public-private partnerships to enable informed decision-making, focusing on biodiversity restoration, protection, and sustainable management as foundational elements of a sustainable and equitable ocean economy, and ensuring the inclusion of local and indigenous knowledge alongside environmental sustainability and social equity. The following priority datasets gaps will be targeted: comprehensive and up-to-date data on both human activities and state of the environment supporting informed and equitable decision-making and ensuring stakeholder and rights holder engagement in data capture and knowledge co-production. It will include robust capacity development and sharing as well as knowledge exchange to deepen understanding of ocean-human activity interconnections, emphasising investment in context-specific education, training, and research programs, and the integration of appropriate technology and innovation to support a sustainable, equitable, and resilient ocean economy and ensuring that future generations can benefit from the ocean's diverse resources and opportunities.

## 1.3 Key Recommendations to Achieve the Strategic Ambition

The following recommendations have been identified to ensure that the strategic ambition is fulfilled, and success achieved for Ocean Decade Challenge No. 4: Develop a sustainable and equitable ocean economy:

- Strategic Partnerships: It is recommended to the Decade Coordination Unit and stakeholders involved in the Ocean Decade that by 2025, robust partnerships are established, encompassing governments, NGOs, the private sector, academia, and civil society, with a focus on inclusivity and collaboration across sectors to develop and implement solutions for a sustainable and equitable ocean economy. This will include developing partnership programs which match-make between academic institutions, local communities, and industry to develop and deploy locally adapted solutions to context-specific hindrances.
- Targeted Resource Mobilisation: It is recommended to national governments, international organisations, and private funders that by 2026, dedicated financial mechanisms are in place to support sustainable ocean economy projects, prioritising those that integrate environmental conservation with socio-economic benefits for local communities.
- Private Sector: It is recommended to businesses operating in marine and coastal sectors that by 2028, they adopt sustainable practices and invest in green technologies, contributing positively to the ocean economy while ensuring the well-being of marine ecosystems and local communities.
- Local Communities: It is recommended to local government and community-based organisations that by 2026, community-led initiatives for sustainable ocean resource use are supported, ensuring local involvement in decision-making and equitable sharing of the benefits derived from ocean resources.
- Policy Makers and Decision Makers: It is recommended to policy makers at national and international levels that by 2030, comprehensive policies and governance frameworks such as sustainable ocean plans are implemented, promoting sustainable management of ocean resources, and ensuring equitable access and benefits distribution among all stakeholders, particularly marginalised and indigenous communities.

## 1.4 Key Milestones and Indicators for the Strategic Ambition

The key milestones and indicators that will be used to measure the fulfilment of the strategic ambition include:

1. By 2025, enhance the integration and accessibility of priority datasets to inform sustainable and equitable economic decisions. Indicators include the percentage of relevant data made accessible, adoption of ocean access policies and inclusion of equity data, the level of data interoperability achieved, development of ocean accounts and the contribution of private sector entities to the data ecosystem.
2. By 2027, implement capacity-development initiatives that empower stakeholders to participate in and contribute to a sustainable and equitable ocean economy, fostering a paradigm shift in perceptions and promoting inclusivity and interdisciplinary approaches. Indicators include the number of capacity-development initiatives, the identification and reduction of participatory barriers, the number of participants trained, the level of institutional partnerships established, the assessment of skills and knowledge improvement among participants, and the engagement of private sector entities in promoting sustainable practices.
3. By 2028, develop and adopt sustainable policy frameworks and governance mechanisms that support equitable and environmentally responsible economic

activities. Indicators include the adoption of relevant policies, legislation, regulations, integration of these frameworks into national and international agendas, tracking private sector compliance with sustainability standards and the incorporation of measures to reduce inequities and enhance inclusivity in the ocean economy.

4. By 2029, ensure inclusive and meaningful stakeholder engagement, reflecting a diverse array of perspectives in the planning and implementation of ocean economy strategies. Indicators include the diversity of stakeholders involved, the level of active participation, the incorporation of stakeholder perspectives into decision-making processes, and the specific inclusion of private sector collaboration to foster sustainable and equitable practices.

5. By 2030, mobilise and increase funding dedicated to supporting sustainable and equitable ocean economy initiatives, with a focus on innovative and nature-based solutions. Indicators include the total funding raised, the diversification of funding sources, adoption of sustainable finance principles, development of scalable finance mechanisms for community-level initiatives, the effective leveraging of resources through partnerships and collaborations, and the involvement of the private sector in investing in sustainable ocean initiatives.

## 2. INTRODUCTION

In 2017, the 72nd Session of the UN General Assembly declared 2021-2030 as the United Nations Decade of Ocean Science for Sustainable Development (the 'Ocean Decade')[1]. The vision of the Decade is 'the science we need for the ocean we want', and it provides a common framework for diverse rights holders and stakeholders to generate and use ocean information, data, evidence, and knowledge towards achieving the 2030 Agenda for Sustainable Development.

The Ocean Decade seeks to improve humanity's relationship with the ocean, its mission being 'to catalyse transformative ocean science solutions for sustainable development, connecting people and our ocean' (IOC-UNESCO, 2021). The Ocean Decade Challenges represent the highest level within the Ocean Decade Action Framework and articulate the most immediate priorities for the Ocean Decade. As part of the Ocean Decade Vision 2030 process, Expert Working Group 4 has been assigned the task of outlining the strategic ambition for Ocean Decade Challenge 4: Develop a sustainable and equitable ocean economy. This challenge focuses on generating knowledge, supporting innovation, and developing scalable solutions for equitable and sustainable development of the ocean economy amidst changing environmental, social, and climate conditions, while recognising and supporting existing good practices and solutions.

An essential component of addressing Challenge 4 is recognising what challenges are faced and what is meant by equitable and sustainable development of the ocean economy and for whom it is intended. The concept of the ocean economy has diverse definitions (FAO, Duke University & WorldFish, 2023), depending on organisations or countries' interests, needs, and perspectives. The rights holders and stakeholders of the ocean economy are diverse, reflecting a wide range of sectors and uses, which underscores the global significance of ocean-related issues. This includes the coastal communities and Indigenous Peoples that have been the historical caretakers of the coasts and seas and are intrinsically tied to the knowledge, culture and health of the ocean. It will also include scientists and researchers, policymakers, environmentalists, educators,

[1] Proclaimed by the United Nations General Assembly in December 2017, the challenge runs from, 2021-2030.

entrepreneurs, the private sector and the general public including landlocked countries. Further the ocean's vastness and unique characteristics, with over 60% classified as international waters, present distinct challenges in achieving sustainable growth, equity, and environmental protection. The high mobility of marine life and the absence of clear boundaries complicate international collaboration and data gathering, crucial for an informed, sustainable ocean economy.

Here, a comprehensive view of a sustainable ocean economy is needed that not only emphasises the environmental, social and economic value of the ocean's goods and services but one that recognises that healthy and resilient ocean ecosystems are the bedrock of a sustainable ocean economy and that values an integral and holistic perspective. A sustainable ocean economy must acknowledge and prioritise the culture, identity, and rights of Indigenous People and Local Communities (IPLC) that have historically depended on and thrived alongside ocean resources. It should recognise not only present needs but also the imperative of securing the ocean for future generations. In tandem, it should consider the range of economic activities within ocean and coastal environments, spanning vital sectors such as fisheries, tourism, renewable energy, shipping, and biotechnology. It should also be associated with improved livelihoods, inclusivity, and gender equity for its rights holders, as well as ensuring the health of ocean ecosystems alongside sustainable economic activity. To achieve a sustainable and equitable ocean economy, the approach should be balanced and reflective, acknowledging biological and cultural diversity while ensuring just and equitable access to resources and distribution of its benefits, thereby ensuring that future generations can benefit from the ocean's diverse resources and opportunities.

Challenge 4 is intertwined with other Challenges within the Ocean Decade. The integration, synergies, and interdependencies among the Challenges are vital to achieving the overarching goals of the Decade. Its success involves fostering collaboration across all Challenges to create a holistic approach to strengthening humanity's relationship with the ocean, ultimately securing a sustainable and equitable future for both current and future generations.

## 3. CONTEXT

### 3.1 Importance of the Ocean

The ocean holds universal significance, playing a vital role in the wellbeing of societies, by generating oxygen, providing nutritious food and sustenance, acting as a carbon and heat reservoir, and supporting economic activities and recreational pursuits. Moreover, it embodies cultural, spiritual, and identity values, fostering local and indigenous knowledge, and contributing to the well-being of individuals and communities worldwide.

The ocean is an important source of livelihoods for people worldwide. Current estimates indicate that the ocean food sector alone sustains around 600 million livelihoods (FAO, 2022), with 40% of global marine and inland capture provided through small-scale fisheries, and 45 million women participating in small-scale fisheries (FAO, Duke University & WorldFish, 2023). Beyond this, various ocean-related and adjacent industries, including shipping, energy, and tourism, offer employment opportunities for countless individuals. Maritime shipping, in particular, stands at the core of global trade, facilitating the movement of up to 90%[2] of global trade through ocean routes. Small Islands Developing States (SIDS) particularly depend on shipping for essential functions, such as transporting people, food, medicines, and ensuring connectivity among communities.

The ocean's significance extends beyond its role in livelihoods and employment, most

[2] https://www.oecd.org/ocean/topics/ocean-shipping/

notably for vulnerable coastal communities. It hosts a large tourist sector, fostering well-being and recreational activities worldwide, attracting 8.9–13.6 million marine diving tourists alone (Schuhbauer et al., 2023). It also serves as a fundamental source of essential nutrients and protein to over 3 billion people globally, particularly for nations facing food deficits, who depend on aquatic resources for food security[8]. The ocean is also significant in terms of climate change mitigation potential; ocean-based climate solutions have the potential to reduce emissions by up to 35% along a 1.5°C pathway and up to 47% along a 2.0°C pathway (Hoegh-Guldberg et al., 2023). The recent UNFCCC discussions clearly highlighted that there will be no 1.5 degrees without a healthy and resilient ocean.

In the broader global economic context, a sustainable and equitable ocean economy is a critical component. It not only supports ocean-based industries but also significantly contributes to land-based economies, in particular coastal communities who have a high dependence on ocean and coastal ecosystems for their wellbeing. Present estimates suggest that ocean assets are worth up to US$24 trillion (Hoegh-Guldberg et al., 2015) while the services it provides are valued between $1.5 trillion and $6 trillion per year (Hoegh-Guldberg et al., 2015, Lillebø et al., 2017, Cicin-Sain 2015, OECD 2016). Furthermore, the ocean economy is poised for rapid expansion and is widely regarded as a novel economic frontier (Jouffray et al., 2020)[3], but only if ocean ecosystems are able to support this ambition. Certainly, there is a need to focus efforts on recovery of coastal ecosystems and to develop and implement long-term sustainable management approaches, including protection, if we are to equitably deliver our blue prosperity ambitions.

Business-as-usual activities such as unsustainable coastal development and the impacts from extractive industries, further exacerbated by climate change have left the ocean environment degraded (García-Soto et al., 2021). The activities accompanying economic growth further intensifies environmental pressures, putting important ocean ecosystem services such as its role in the global carbon cycle, food security, biodiversity, etc., at a higher risk. Additionally, the benefits from economic growth are not equitably distributed (Evans et al., 2023). The projected 'blue acceleration' under the status quo of unsustainable development is forecasted to pose a substantial cumulative risk (Garcia-Soto et al., 2021), estimates suggest a potential impact of USD $8.4 trillion on assets and revenues across all ocean sectors over a 15-year period (WWF, 2021).

## 3.2 Importance and relevance of the Challenge for sustainable development

The equitable and sustainable development of the ocean economy is intricately linked to the broader global agenda for sustainable development, but it also holds immense importance, not only for preserving the planet but also for ensuring the wellbeing of present and future generations through a human rights-based approach. In doing so, we aim to foster a future where the ocean continues to serve as a source of life, inspiration, vitality, culture, and social and economic opportunity.

While sustainable development is often understood to be a harmonious combination of social, environmental, and economic priorities, to produce a "win-win-win" scenario, in situ attempts showcase a lack of interconnectedness between these three pillars which can result in short term success at the expense of long-term sustainability (Noonan-Birch, 2023). Further, the human relationship with the ocean isn't purely economical nor is it equitable. The ocean human relationship can be built on non-monetary values that relate to broader aspects

[3]In 2016, the OECD projected the ocean economy would double from 2010-2030. OECD 2016. The Ocean Economy in 2030.

of wellbeing, identity, or a sense of place, among others (Allison et al., 2023). The access to ocean resources as well as the exposure to the benefits and harms are also not equally distributed (Österblom et al., 2020). For example, one company has registered 47 percent of all known marine genetic sequences within gene patents, resulting in sole control over potential economic advantages, raising significant concerns related to potential inequities in access and benefit sharing, risks of biopiracy, and implications for biodiversity and conservation efforts, among others (Blasiak et al., 2018). In light of non-monetary dimensions and issues of inequity, the development of a sustainable ocean economy necessitates a holistic approach. It should consider the diverse interests and objectives of various stakeholders and clearly differentiate them from rights holders (those Indigenous People and Local Communities (IPLC)) that should have clear tenure and access rights to maintain their form of life in the future. Additionally, it must recognise intrinsic and relational values. Economic and instrumental values are not the sole benchmark for a sustainable and equitable relationship with the ocean.

## 3.3 Overview of current work in the Ocean Decade

In an effort to achieve the vision of the Ocean Decade, Decade Actions are being co-designed, co-delivered, and sought to address the gaps in science, knowledge, and solutions. Decade Actions represent committed initiatives encompassing a range of levels, comprising programs, projects, activities, and contributions, all aimed at achieving the Ocean Decade's objectives and Challenges. To date, 48 Programs, 276 Projects, and 87 Contributions have been initiated within the Decade framework, in addition to over 300 early career professionals actively engaged. Further, the initiative has successfully mobilised approximately 15 million dollars in funding to further support Decade Actions, as indicated in the 2021-2022 Progress Report.

However, while 156 actions have identified Challenge 4 as a pertinent focus, only 2 have exclusively centred their efforts on this Challenge. Furthermore, there are only 14 projects and 1 contribution toward Challenge 4, resulting in it being the most underrepresented within the Decade. It is also crucial to acknowledge that the participants of the Ocean Decade represent only a portion of the global community working on these issues and that many IPLC are contributing invaluable knowledge, effort, and resources towards ensuring ocean resilience and conservation.

## 3.4 Gaps and Barriers

Achieving Challenge 4 is not without its own hurdles; several gaps and barriers must be addressed to achieve the overarching objectives and outcomes. Among these, unabated climate change continues to be the most imminent threat to the planet. However, there are a range of issues that require attention including institutional inefficiencies, knowledge gaps, financial challenges, lack of collaboration, pre-competitive challenges, lack of trust, as well as inclusive approaches for indigenous peoples, local communities and small-scale enterprises, as well as their participation in key decision-making efforts and policies.

### *3.4.1 Climate change*

The ocean plays a pivotal role in controlling our climate, sequestering roughly a third of anthropogenic CO2 emissions, while also providing crucial coastal protection through coral barrier reefs and mangrove ecosystems. Climate change hinders the realisation of sustainable ocean development but also poses a significant threat to our collective future. Its extensive impacts, such as rising sea levels and extreme weather events, have direct and profound consequences for both the ocean and the communities that depend on it, such as changes in temperature and salinity affecting fish distribution (Townhill et al., 2023). Climate change disproportionately affects SIDS, coastal communities, IPLC, women and socially vulnerable groups due to their heightened exposure, vulnerability, and limited adaptive

capacity resulting from political and economic marginalisation (Otto et al., 2017).

Unabated climate change is presenting a risk to ocean health, coastal communities, and coastal urban environments alike. The impacts of climate change, compounded by rising sea levels, could result in a $1 trillion loss in real estate value along the U.S. coastline alone (USGCRP, 2018). Mangrove restoration could save an estimated US$65 billion per year in terms of storm and flood damage, however if lost or destroyed, it has been estimated that 15 million more people annually could be flooded across the world (Pérez-Cirera et al., 2021).

It is crucial to address climate change urgently, as without mitigation, the prospect of realising a sustainable and equitable ocean economy remains unattainable. Developing innovative solutions and adapting to these environmental shifts are imperative to tackle the challenges climate change presents.

#### *3.4.2 Institutional Inefficiencies*

Current institutional structures, at national, regional, and global levels, are laden by inefficiencies as well as a lack of inter institutional coordination, compromising their ability to navigate complex ocean issues. This includes insufficient capacity, resulting in limited effectiveness, as well as systemic inequities leading to the uneven distribution of resources and benefits. Differing sustainability standards, principles, and definitions among organisations can further exacerbate these challenges.

The current definition of sustainable development, as outlined by the SDGs, prioritises equity with its commitment to "leave no one behind." However, the lack of clear distinction between a regular ocean economy and a sustainable ocean economy rooted in socio-ecological equity risks "blue washing", thereby diminishing the effectiveness of the sustainable ocean economy (Noonan-Birch, 2023). While there are a number of existing sustainability standards and criteria, none are internationally agreed upon to determine what ocean activities and operations are "equitable and blue enough" to be included in the sustainable ocean economy. This has resulted in multiple overarching guidance frameworks such as UN Global Compact Sustainable Ocean Principles (UNGC, 2020), World Wildlife Fund (WWF)'s Sustainable Blue Economy Principles (WWF, 2015), UN Environment Programme (UNEP) FI's Sustainable Blue Economy Finance Principles, or the Science Based Targets Network[4] as well as sector-specific strategies, including the Taskforce on Nature-related Financial Disclosures[5], the Getting to Zero Coalition maritime shipping's decarbonisation ambition and strategy (Global Maritime Forum Getting to Zero Coalition), the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) (FAO, 2015), among others.

#### *3.4.3 Knowledge and Innovation*

Strengthening the interface between scientific knowledge, other knowledge systems, policy implementation and public-private partnerships is vital for informed decision-making and a priority for bridging this gap. Particularly, there remain significant gaps in our understanding, especially for areas such as the deep ocean, which is crucial for the holistic management and sustainable stewardship of our ocean's ecological and biological systems. Achieving a sustainable and equitable ocean economy is inherently challenging due to the ocean's complex interconnected nature, it will require concerted and synergistic efforts from all ocean users, rights holders, stakeholders, and decision makers, entailing comprehensive planning, integration among sectors, and the consideration of social and environmental concerns alongside economic factors. It is critical that bridging the gap includes the

[4] Science-based targets for companies and cities to provide a clearly-defined path to reduce emissions in line with the Paris Agreement goals.

[5] Disclosure recommendations and guidance for organisations to report and act on evolving nature-related dependencies, impacts, risks and opportunities.

recognition and inclusion of local and indigenous knowledge.

The availability of comprehensive and up-to-date data is indispensable for informed and equitable decision-making, while identifying and filling data gaps is critical for effective sustainable development. The absence of comprehensive data not only impedes informed decision-making but also heightens the risk profile of projects and enterprises in the ocean realm, subsequently impacting financiers' confidence in funding initiatives within this sector. Addressing gaps in the practical implementation and management of strategies is a significant challenge that must be confronted.

#### *3.4.4 Just Finance*

Addressing gaps and barriers in ocean finance is essential for advancing towards a sustainable and equitable ocean economy (Sumaila et al., 2021). A key issue is the current absence of a supportive enabling environment, which requires the development of robust regulatory and policy frameworks at national, regional, and global levels to derisk the enabling environment and attract private sector finance. Further, a significant challenge is the lack of comprehensive information on the ocean's value, leading to market practices that favour unsustainable activities. Additionally, there is a lack of investible sustainable blue economy projects with suitable risk and return profiles, highlighting a significant financial gap. The sustainable ocean economy also faces challenges in insurance and risk mitigation. Perceived high risks and the lack of adequate regulatory frameworks, particularly in the coastal community, SIDS and Least Developed Countries (LDC) contexts, deter financiers, and the absence of comprehensive insurance solutions adds to the challenges. These barriers underscore the necessity for a concerted effort to address the financial challenges impeding the transition to a sustainable and equitable ocean economy.

## 3.5 Analysis of user needs and priorities

In the pursuit of sustainable and equitable ocean development, understanding the diverse array of users and their unique needs and priorities is paramount. These users span a wide spectrum, including governments, industries, investors, rights holders, and stakeholders. Governments play a pivotal role in shaping ocean policies and regulations, necessitating effective governance structures and policy frameworks and thereby creating a supportive, enabling, and equitable environment for public and private sector finance and investment.

Industries, ranging from shipping to fisheries and offshore renewable energy, require tailored and innovative approaches to ensure sustainability. Financiers, both public and private, seek finance frameworks that ensure returns while upholding sustainability and adhering to environmental and social standards. Stakeholders and rights holders such as IPLC hold specific tenure and access rights over the coastal and ocean territories, recognition and attending to their needs is critical for equitable and ethical development. Additional stakeholders may encompass NGOs, small-scale businesses, and individuals which hold varying involvement or interests in the ocean. Furthermore, distinguishing between large-scale industries and small-scale enterprises is essential, as their requirements and capabilities significantly differ. There should be a clear differentiation between rights holders and stakeholders needs, with women and gender issues considered. Prioritising the needs of users should be informed by the gaps and barriers previously identified within ocean development, alongside a human rights-based approach that is inclusive of local and indigenous knowledge and rights, in both policy development and decision-making.

The determination of priorities in sustainable and equitable ocean development is influenced by several critical factors. First, fostering a robust interface between knowledge and policy, as well as ensuring the benefits and impacts are equitable, is essential. Prioritising

the seamless exchange of knowledge and expertise between the scientific community, traditional knowledge holders like IPs and local communities, policymakers and ocean users is fundamental to informed decision-making. This includes advancing towards inclusivity of rights holders in the decision-making processes and ensuring the just and fair distribution of benefits derived from the ocean economy sectors, contributing significantly to equitable impacts. Priorities are also shaped by international, regional, and national dynamics, necessitating consideration of these contexts when establishing a framework for sustainable and equitable ocean development. Prioritising practices that safeguard ecosystems and improve the livelihoods of IPLC is integral to sustainable and equitable ocean development. Finally, the acceptance of clear and universally accepted criteria for what qualifies as 'sustainable' and 'equitable' in the ocean economy is vital. These criteria serve as a foundation for practices that align with the principles of sustainability, ensuring that the sustainable ocean economy is a truly holistic and equitable endeavour.

# 4. STRATEGIC AMBITION SETTING

## 4.1 Methodology for strategic ambition setting

The methodology employed in the development of strategic ambition involved a layered approach to ensure comprehensiveness and accuracy. This process commenced with an extensive literature review encompassing a wide range of pertinent documents. This review provided a foundational understanding of the existing body of knowledge and insights relevant to the ocean economy and its sustainable development.

In addition to the literature review, expert input played a crucial role in shaping the strategic ambition. Twenty-one experts from various fields and disciplines were actively engaged throughout the process. Their contributions provided nuanced perspectives and valuable insights, enriching the overall content and direction of the strategic ambition.

The methodology also incorporated an iterative revision process, with both the working group and external stakeholders contributing, thereby ensuring that the strategic ambition was refined, comprehensive, and reflective of diverse viewpoints.

## 4.2 Definition of the strategic ambition for the Challenge

### *4.2.1 Vision for 2030*

In defining the vision of success for Challenge 4 of the Ocean Decade, it is essential to adopt a broad perspective that encompasses environmental, equitability and justice, and resilience in addition to economic aspects. To truly realise a sustainable and equitable ocean economy, the solution is multifaceted, with each facet contributing to the overall achievement of this critical challenge. A sustainable and equitable ocean economy that ensures protection, restoration and maintenance of ocean ecosystems is:

- Managed in an equitable manner
- Accessible and equitable for current and future generations
- Underpinned by sustainable practices across all sectors - including circular economy approaches
- Resilient to changing conditions
- Supported by accessible and comprehensive knowledge and data
- Supported by good governance linked to knowledge and action

Realising a sustainable and equitable ocean economy by 2030, depends on a joint effort in knowledge generation and sharing, underpinned by strong partnerships and sufficient resource allocation, reinforced through capacity development and knowledge exchange, and enhanced by appropriate technology and innovation, all supported by just and sustainable finance.

#### Managed in an equitable manner

A sustainable and equitable ocean economy cannot occur unless its resources are managed in a fair way. By upholding this principle, the ocean economy can enable innovative solutions

and knowledge by fostering an environment where diverse stakeholders can collaborate effectively, share insights, and work toward common goals. This emphasises the crucial inclusion of local and Indigenous knowledge in decision-making processes and the promotion of a human rights-based approach to conservation and development. To achieve this, it is essential to implement a human rights-based approach to ocean conservation and sustainable use, which guarantees shared governance schemes with IPLC, in addition to recognition of IPs governance models under their traditional decision-making structures. Moreover, it ensures equitable access to the benefits derived from ocean resources, without regard for the scale or size of industry operations. It's essential to recognise that not all ocean-based industries drive equitable economic growth. To safeguard small-scale sectors and the livelihoods of coastal communities, measures must be implemented to shield them from potential impacts brought on by large-scale, profit-driven ocean industries.

### Accessible and equitable for current and future generations

The ocean economy needs to be both accessible and equitable for both present and future generations. It should be underpinned by collaborative partnerships and ensure fair and impartial distribution of ocean resources and opportunities, actively bridging the divide between developed and developing nations. Furthermore, promoting intergenerational dialogues leading to decision-making and innovation should be developed, ensuring that the perspectives of both current and future generations are included in shaping the ocean's sustainable future. Gender consideration, especially the inclusion of women and girls throughout all discussions related to ocean conservation, is a must. Economic and social advantages need to be accessible to all, regardless of background or geographical location. Any development must be sustainable and inclusive, catering not only to the current generation but also to the prosperity and well-being of future generations to come.

### Underpinned by sustainable practices across industry - including circular economy approaches

The rapid expansion of ocean-related industries is poised to bring about significant economic and societal changes, affecting both indigenous and local communities and the broader economy. Yet, the continuation and further adoption of unsustainable practices threatens to impede this progress. Industries must undergo a transformative shift in their operational approaches, leaving behind business-as-usual activities and approaches, to enable sustainability and equity across the ocean.

Decarbonisation and the transition to a low carbon economy are essential for sustainability, they stand as paramount goals demanding immediate attention, given their critical role in mitigating climate change. Industries must prioritise the reduction of carbon emissions and pivot decisively towards renewable energy sources to drive substantial environmental impact and ensure a sustainable future. A component of this transition will be the adoption of circular economy principles, which underscore the importance of reducing waste, reusing resources, and recycling materials within ocean-related sectors. These principles significantly enhance resource efficiency, minimise environmental impact, and ensure the ocean economy's resilience by reducing its reliance on finite resources.

To guide industries towards a common vision of a sustainable and equitable ocean economy, existing frameworks such as the United Nations' Sustainable Development Goals (SDGs), the High Level Panel for a Sustainable Ocean Economy's Transformations agenda, the Sustainable Blue Economy Finance Principles and associated guidance[6], emerging Science Based Targets Network, the Sustainable

[6] https://www.unepfi.org/blue-finance/resources/

Small-Scale Fisheries Guidelines (FAO, 2015) and the United Nations Global Compact's Ocean Principles offer invaluable directives. However, in order to achieve a global sustainable ocean economy and measure its socio-ecological progress, it is essential to establish proper internationally agreed criteria, building on these existing efforts.

Transitioning toward a nature-positive and social-positive paradigm necessitates that all sectors comprehensively assess their environmental impact and prioritise critical issues along their value chains. This includes the imperative task of decarbonising ocean-related and ocean-adjacent industries, as well as managing waste and wastewater, especially in developing nations. The transition to renewable ocean energy will play a pivotal role and will require the development of a clear framework that minimises negative impacts of clean energy infrastructure on the ocean environment and the communities it supports. Further fostering transparency and traceability is essential. This will necessitate a holistic approach encompassing the understanding of fish stock dynamics, compliance with sustainable management plans, the use of responsible fishing gear, and the prevention of illegal, unreported, and unregulated (IUU) fishing from infiltrating the supply chain. A human rights-based approach should be adopted that respects the tenure and access rights of rights holders, particularly small-scale fishers of indigenous and local communities, without unfairly penalising their actions under the guise of conservation.

By fostering sustainability and inclusivity, stakeholders and rights holders can contribute to the regeneration of ocean ecosystems, furthering the concept of a nature-positive and social-positive ocean economy. In addition, all stakeholders and rights holders can adopt innovative approaches that integrate multiple solutions within a shared ocean space. For instance, combining renewable ocean energy initiatives with sustainable fisheries or aquaculture practices in designated areas can create synergies that enhance both economic, environmental, and social outcomes. Following sustainable practices, social inclusion, and respecting tenure and access rights of local communities, coastal tourism can be a driver for ecosystem regeneration, nature positive impacts and destination resilience, benefiting the local economy, through tourism and the promotion of nature-based and/or ecosystem-based solutions. The equitable distribution of economic benefits with IPLC, and small-scale enterprises and their integration into the blue economy needs to be contemplated by these sectors[7].

### Resilient to changing conditions

Changing environmental, social, and climate conditions necessitate a resilient sustainable and equitable ocean economy which is able to address the multifaceted challenges facing it. Notably, climate change remains one of the most critical challenges. Ocean industries need to enable practices that both mitigate and adapt to the impacts of climate change, transitioning to low-carbon and carbon-neutral practices such as the adoption of circular economy principles. This involves shifts towards renewable energy sources, energy-efficient technologies, maintaining and strengthening carbon sinks, ensuring that the ocean economy aligns with climate targets. Additionally, it means considering social considerations and ensuring a fair and just distribution of benefits derived from the use of ocean environmental services.

Furthermore, the changing environmental conditions will inevitably exert pressure on livelihoods, food scarcity and security. In this context, the promotion of sustainable fishing practices and responsible aquaculture development is pivotal. This approach will also require IPLC being able to exercise their right to tenure, access to resources and receive a just and equitable distribution of benefits.

[7] See SSF Call to Action https://drive.google.com/file/d/1qowa6ww_qOP4L8aiaHasq9mqTy4BnqqW/view

Simultaneously, a commitment to responsible consumption and production principles, along with the support and strengthening of fair and just market exercises and innovations, ensures that the ocean becomes a source of food security while maintaining the health of marine environments, particularly benefiting small-scale fisheries operated by IPs and local communities.

This transformation towards resilience also demands an enhanced focus on participatory monitoring and research. Regular data collection, research efforts, and ongoing monitoring provide invaluable insights into changing ocean dynamics and ecosystem health. This information should empower industries, rightsholders and policymakers to make informed decisions, fostering adaptive management. It will also need to be coupled with investment in innovation and technology to bolster adaptive capacity within ocean industries.

### Supported by accessible and comprehensive knowledge and data

A central tenet of Challenge 4 relies on generating knowledge, data, supporting innovation, and developing solutions to foster a sustainable and equitable ocean economy. Accessible and comprehensive knowledge equips decision-makers, industries, and communities with the essential data needed for informed choices, promoting sustainable practices. This knowledge can foster innovation in ocean industries, should support IPLC ways of life and livelihoods and should ensure the equitable and just distribution of benefits derived from the ocean economy. Internationally, shared knowledge promotes global collaboration in managing the ocean sustainably. This ambition necessitates the utilisation of technology and data-driven approaches, which facilitate the development of a deep understanding of the ocean's dynamic processes and the intricate interactions and impacts of human activities upon it.

### Supported by good governance linked to knowledge and action

The cornerstone of a sustainable and equitable ocean economy lies in the realm of effective governance, marked by well-defined frameworks, international cooperation, equitable and fair recognition of the importance of rights holders in the marine territories of life, and innovative conservation strategies. Robust, context and culturally specific regulatory frameworks are vital to establish clear rules and guidelines, essential for curbing detrimental practices that pose threats to marine ecosystems or strengthen positive practices. An integrated approach to governance at all levels, particularly within governmental structures, becomes paramount. This integrated approach ensures that competing priorities are fully addressed across Ministries, fostering a unified plan of action for restoring, protecting, and sustainably managing the natural assets critical for a sustainable and equitable blue economy. Notably, this approach has shown effectiveness, as observed in Belize, signifying the need for integrated Sustainable Ocean Plans.

Given the ocean's interconnected nature that transcends political borders, fostering international collaboration becomes an imperative task. Collaborative agreements serve as the linchpin for safeguarding transboundary marine areas and preserving shared resources. It is essential to establish additional agreements designed to promote the exchange of information, the sharing of cutting-edge technologies, and collaborative research.

Moreover, the transition to a sustainable and equitable ocean economy necessitates the acknowledgment and adoption of alternative conservation and governance methods when they are applicable. These innovative approaches offer new pathways for the protection and responsible management of ocean resources. Additionally, they provide an avenue to implement a human rights-based approach to ocean conservation and sustainable use as demanded from international agreements.

### 4.2.2 *Knowledge generation and sharing*

Achieving the vision for a sustainable and equitable ocean economy will rely on a concerted effort in knowledge generation and sharing. This involves several key elements, including the identification and use of priority datasets, the establishment of information and data frameworks such as ocean accounts and their consistent implementation across nations, as well as strategies to ensure knowledge dissemination reaches all audiences, especially developing countries that do not have access to this information.

Engaging a diverse range of stakeholders and rights holders in data capture and knowledge co-production and incentivising their participation, can bolster informed decision-making. Encouraging stakeholder and rightsholder involvement should be seamlessly integrated into overall governance strategies, ensuring active participation in data-related initiatives, as well as effective engagement and governance processes. It is essential to secure the participation of rights holders, including IPs and small-scale fishing communities, in this process to ensure their valuable insights are integrated. Integrating multiple knowledge systems is key. Datasets will play a pivotal role in informed decision-making and facilitating effective place-based management strategies such as Marine Spatial Planning (MSP) and Sustainable Ocean Planning (SOP). Acknowledging the necessity for downscaled datasets tailored to fit the specific needs of SIDS will be crucial. It is critical to develop and maintain accessible, up-to-date, and reliable datasets to support sustainable ocean management.

In addition to data, the establishment of comprehensive ocean accounts serves as a crucial instrument for informed governance which allows natural capital to be appropriately considered in decision making processes. Ocean accounts organise social, economic, and environmental data and information to enable coherent planning of, and measurement of progress towards, the sustainable and equitable development of the ocean, promoting transparency, accountability, and sound decision-making.

Knowledge sharing must be comprehensive and accessible to reach all audiences effectively. This requires a diversified approach that embraces a range of communication channels, from technical reports and publications to public awareness campaigns and educational programs. To ensure that knowledge reaches all corners of society, the information should be available in multiple languages and formats, catering to various cultural contexts and literacy levels. Knowledge-sharing strategies should prioritise inclusivity and consider the needs of diverse stakeholders and rightsholders, from scientists and policymakers to local communities and Indigenous groups.

### 4.2.3 *Partnerships and resources*

The realisation of the vision will depend significantly on robust partnerships, implementation of a human-rights based approach and the allocation of adequate resources. Partnerships should encompass a multitude of stakeholders and rightsholders, from governments and international organisations to the private sector, academia, and civil society, with special attention to Indigenous and local communities.

Collaboration across these diverse groups is essential to consolidate efforts, exchange knowledge, ensure equity, and develop innovative solutions. For example, partnerships between academia and industry are vital for transforming innovative research into tangible, sustainable practices within marine sectors especially for nascent industries. Such partnerships can drive forward circular economy approaches, reducing waste and enhancing resource efficiency in ocean-related industries. Additionally, joint efforts between the private sector, governments, and local communities are critical for equitable ocean management. These partnerships ensure that economic activities within the ocean sector are aligned with the broader goals of sustainability and community well-being, taking into account the

voices and rights of local and indigenous populations. Further, partnerships that prioritise intergenerational dialogue and knowledge exchange can ensure a sustainable and equitable ocean economy for current and future generations.

Engaging a diverse array of stakeholders in knowledge generation, sharing, and governance processes ensures that diverse perspectives are integrated, enhancing the inclusivity and effectiveness of ocean management strategies. The development and dissemination of accessible, comprehensive knowledge are further enhanced through partnerships that span governmental, non-governmental, academic, and community entities.

#### *4.2.4 Just Finance*

Developing finance frameworks that account for the interplay between ocean, biodiversity, and climate risk is a crucial step in directing financial resources toward sustainable and equitable ocean development. The biggest gains to be had is in the redirection of mainstream finance away from destructive business-as-usual activities towards sustainable development pathways (Narula et al., 2023; Fritsch et al., 2022; Jouffray et al., 2020). To effectively drive sustainable development, it's essential to transition the perspective on ocean-positive opportunities from being seen as early-stage impact investments to becoming mainstream, long-term investments. A pertinent example of this shift is the work of UN Environment, Oceana and leading insurers to tackle IUU fishing through the development of a checklist of warning signs for pirate fishing activity, in addition to denying insurance to those that participate in illicit fishing activities (UNEP, 2019).

This calls for a pressing need to ensure that Financial Institutions (FIs) adopt clear principles and guidance as provided by the Sustainable Blue Economy Finance Principles[8], no longer financing those activities known to cause significant harm to nature and society, providing transition finance to those that are able to move towards sustainability and seeking out those activities that deliver against the Principles. Central banks, by implementing policies that encourage financial institutions to incorporate environmental and climate risks into their lending and investment decisions, can play a pivotal role in redirecting finance from conventional to sustainable ocean-related activities. In addition, it will be critical to focus on integrated project development at local-territorial levels, specifically directing resources and support to promote and recognize the vital efforts undertaken by rights holders in managing and sustainably utilising their marine territories of life. Exploring nature-based and/or ecosystem-based approaches and innovative solutions to finance and invest in these efforts becomes imperative.

As importantly, there is insufficient philanthropic and official development assistance (ODA) finance available to support the delivery of SDG14 and a sustainable and equitable ocean economy (Lewis et al., 2023). Private sector finance is critical to achieve this shift (Thiele and Gerber, 2017; Sumaila et al., 2021). As indicated, ensuring that mainstream private sector finance is directed away from business-as-usual and towards sustainable development pathways is key, but it is also imperative that mainstream finance is targeted at financing transition pathways, as well as the restoration, protection and sustainable management of ocean and coastal ecosystems. Public sector financing is also needed to address those aspects of ocean knowledge and conservation that do not deliver direct commercial returns. New forms of finance will be critical to support those sustainable blue economy activities and projects that don't align with mainstream finance ticket sizes, risk-return ratios or other metrics.

For example, adapting blended finance to deal sizes and risk-return ratios that match

[8] https://www.unepfi.org/blue-finance/the-principles/

available capital resources is pivotal to achieving sustainable ocean development. Integrating nature-based and/or ecosystem-based approaches and innovative approaches into project development, coupled with the utilisation of blended finance models, can expedite the journey toward sustainable ocean development. Moreover, it is imperative that financial resources not only promote sustainability and address climate challenges (Thiele and Epps, 2022) but also support the creation of ocean-positive jobs and provide fair and equitable benefits to local communities and small-scale actors, thereby forming an integral component of inclusive and sustainable development. Financial resources should be accessible at all levels, most critically to small-scale stakeholders and rightsholders, including Micro, Small and Medium-sized Enterprises (MSMEs), which represent a significant proportion of businesses[9].

This will require a number of interventions, including through the provision of venture builder and incubator services to strengthen the capacity of communities and enable them to develop pipelines of viable enterprises and projects. In addition, it is likely that aggregation vehicles will be needed to enable finance to flow more readily to such small-scale enterprises. New income streams to underpin financing of the restoration, protection and sustainable management of ocean and coastal ecosystems will need to be explored, developed, and implemented, whether that be through user fees, payment for ecosystem services or other means. A range of finance mechanisms, including blue bonds, parametric insurance and ocean-based blended finance vehicles are currently being explored and implemented globally[10].

Finally, it is imperative that a strong enabling environment is created to derisk private capital financing and investments and support this transition. Most notably the gaps in current ocean governance and lack of clarity around tenure are considered to create a high-risk environment to financiers. For example, governance tools might include the use of incentives and disincentives to encourage best practice, as well as a clear governance framework for the High Seas as a result of the new Biodiversity Beyond National Jurisdiction (BBNJ) treaty (Thiele 2022). It is critical that governments develop integrated Sustainable Ocean Plans (Hanson et al., 2020) and related strategies that clearly place the restoration, protection, and sustainable management of the ocean's natural assets as a priority. This way development plans can promote integrated financing so that one sector does not impede progress in another and does not erode the resource base on which national and local social and economic priorities depend. Having strong plans in place - and the use of integrated ecosystem-based spatial management tools - as well as effective capture of and access to reliable data - would send a clear and positive signal to private sector financiers (de Sanctis et al., 2022).

#### *4.2.5 Capacity development and exchange needs*

Capacity development and the exchange of knowledge will play pivotal roles in achieving the vision outlined in Challenge 4. To foster a deep understanding of the ocean and its intricate interactions with human activities, enhancing the skills and expertise of individuals, rightsholders, and institutions across diverse sectors is paramount. Adequate investment in context specific, culturally adequate education, training, and research programmes is crucial to ensure the success of these programs. To prioritise these investments, a capacity and knowledge landscape map and gap analysis of the sustainable ocean economy should be undertaken. This is a necessary step to ensure

[9] In OECD countries, SMEs account for about 99 percent of firms. Enhancing the contributions of SMEs in a global and digitalised economy, OECD, June 2017.

[10] The Friends of Ocean Action and WEF 'Ocean Finance Handbook' provides a good summary https://www3.weforum.org/docs/WEF_FOA_The_Ocean_Finance_Handbook_April_2020.pdf

that initiatives to increase capacity and knowledge are doing so in a measurable way and that they underscore equity, innovative solutions, and sustainability.

Developing the capacity of institutions, fostering inter institutional collaboration, and establishing mechanisms for capturing, analysing, and sharing critical data are crucial to effectively manage and govern the ocean. Developing the necessary expertise and skills among decision-makers, rightsholders and stakeholders can enhance the ocean's sustainable development. The existing inequalities and disparities in resource allocation and benefits-sharing must be addressed to ensure equitable access to the ocean's opportunities.

A key facet of capacity development is the empowerment of local communities, particularly Indigenous groups who possess invaluable traditional knowledge and historic stewardship of the ocean as well as other vulnerable or marginalised groups. Their expertise should be recognised and integrated into broader efforts to ensure a holistic understanding of the marine environment and input policy making related to their marine territories of life. In addition, a fundamental component will be establishing collaborative knowledge exchange, fostering a global network of information sharing that transcends geographical and sectoral boundaries. To establish robust systems for knowledge exchange, mechanisms should be put in place to ensure that the latest research findings, best practices, and innovative solutions are accessible to a broad audience.

It is essential that information is disseminated in an inclusive, equitable and accessible manner. This involves translating complex scientific findings and traditional knowledge into user-friendly formats, engaging in collaboration with a variety of stakeholders, and prioritising open-access platforms that facilitate the easy sharing of knowledge. The ocean science community, rightsholders, policymakers, industries, and the general public should have the means to conveniently access and benefit from this shared knowledge. The exchange of knowledge must extend not only within sectors but also between geographic regions, promoting equitable access and exchange of expertise on a global scale.

#### *4.2.6 Technology and innovation solutions*

Technology and innovation can empower the transition to a sustainable, equitable, and resilient ocean economy. Leveraging technological advancements, such as satellite-based monitoring, machine learning, and data analytics, and ensuring equitable sharing holds great promise in enhancing our understanding of the ocean. These innovations can contribute significantly to filling knowledge gaps and improving the accuracy and depth of the data collected. The vital role of local and Indigenous knowledge in sustainable ocean development cannot be understated. Therefore, acknowledging, respecting, and incorporating this knowledge is fundamental for holistic and effective ocean planning.

Context-appropriate technology is paramount, and ensuring free, prior, and informed consent (FPIC) for the use of new technologies and innovations is crucial, especially within the marine territories of IPLC, including small-scale fisheries. Technology choices should align with local context and have the scalability to meet evolving needs, respecting the rights and choices of these communities. Innovative solutions must be suitable for the specific conditions and challenges of various ocean regions, accounting for ecological, social, and economic differences.

Infrastructure development is integral to accommodating technological advancements. Upgrades to infrastructure, such as ports and grids, will be essential to harness the full potential of innovative technologies. Identifying and promoting existing technologies should be prioritised through knowledge sharing to capitalise on existing efforts and reduce redundancy. Continued collaboration within the global community is crucial to avoid duplicating efforts and build upon successful innovations,

respecting the principles of FPIC and avoiding reinventing the wheel.

#### *4.2.7 Integration, synergies and interdependencies with other Challenges*

The realisation of the objectives within the Ocean Decade relies upon a comprehensive and interdependent effort across all its challenges. Challenge 4, with its strategic focus on generating knowledge, fostering innovation, and constructing solutions to promote equitable and sustainable ocean economic development, occupies a unique and central position in this network of goals. It serves as the linchpin, harmonising various dimensions of sustainable development and equitable growth across the scope of ocean science initiatives, while at the same time being dependent on successes/actions under other challenges (See Table 1). This challenge, among others, is interlinked, forming a framework of objectives where each component influences and supports the collective aspiration of the Ocean Decade.

***Table 1:*** *Linkages between Challenge 4 and the Ocean Decade Challenges*

| OCEAN DECADE CHALLENGES | LINKAGES TO CHALLENGE 4 |
|---|---|
| **Challenge 1: Understand and beat marine pollution** | Challenge 4 contributes by promoting sustainable economic practices that inherently reduce harmful impacts on ocean ecosystems and subsequently help in pollution mitigation. Achieving Challenge 4 also depends on a clean ocean. |
| **Challenge 2: Protect and restore ecosystems and biodiversity** | Challenge 4 is complementary to Challenge 2 as it promotes sustainable economic practices which will require that ecological stressors are mitigated, and biodiversity is preserved. It also recognises the inputs from IPLCs into conservation efforts and sustainable use of the ocean. |
| **Challenge 3: Sustainably feed the global population** | Aquatic food systems are a key component of the Blue Economy; governance and management of these systems must therefore be integrated in a wider framework, with consideration of other ocean industries. |
| **Challenge 4: Sustainably feed the global population** | Challenge 4 aligns with all Decade Challenges. |
| **Challenge 5: Unlock ocean-based solutions to climate change** | Challenge 4's focus on generating knowledge and solutions for equitable and sustainable ocean development contributes to the objectives of Challenge 5 by enhancing understanding of the ocean-climate nexus. Sectors delivering ocean-based climate solutions are key sectors in an equitable and sustainable ocean economy. |
| **Challenge 6: Increase community resilience to ocean hazards** | Challenge 4's focus on equitable economic development can enhance community preparedness and resilience, which is a core aspect of Challenge 6. |
| **Challenge 7: Expand the Global Ocean Observing System** | Challenge 4 relies on data from a sustainable ocean observing system to inform sustainable economic planning and development. |
| **Challenge 8: Create a digital representation of the ocean** | Challenge 4 aligns with the objectives of Challenge 8, which aims to create a dynamic digital ocean representation and comprehensive ocean map, supporting data requirements for sustainable economic development. |
| **Challenge 9: Skills, knowledge, and technology for all** | Capacity development, a central theme in Challenge 9, plays a pivotal role in advancing the sustainable development of the ocean economy as proposed in Challenge 4. |
| **Challenge 10: Change humanity's relationship with the ocean** | Challenge 4 promotes the economic and cultural values of the ocean by emphasising equitable and sustainable practices. This aligns well with the objectives of Challenge 10, which aims to enhance the understanding of the ocean's multiple values and services for sustainable development. |

The achievement of Challenge 4 closely aligns with various international oceanic objectives, illustrating its crucial role in advancing worldwide ocean sustainability. Challenge 4 fundamentally revolves around the imperative of promoting fair and sustainable development within the ocean economy. This key aspect significantly resonates with the overarching goal of Sustainable Development Goal 14 (SDG 14): "Conserve and sustainably use the oceans, seas, and marine resources for sustainable development." Challenge 4's synergy with SDG 14 underscores its crucial role in the broader global effort to safeguard our oceans and

responsibly utilise their resources. Furthermore, Challenge 4 seamlessly integrates with the 2030 objectives of the High-Level Panel for a Sustainable Ocean Economy's Transformations. In the pursuit of these interconnected goals, Challenge 4 significantly contributes to ocean sustainability and ensures the aligned achievement of various other international commitments. These encompass engagements under the Convention on Biological Diversity (CBD) and the Paris Agreement, emphasising Challenge 4's pivotal role in the multifaceted global landscape of ocean conservation and responsible utilisation under a human rights-based approach.

## 5. MILESTONES AND INDICATORS

### 5.1 Key milestones and indicators to measure progress and success

Because of the diversity among and within ocean economies across the globe, it will be difficult to track meaningful progress if milestones and indicators are only created at the intergovernmental and international levels. Therefore, it is necessary that each Nation adopt its own methodology to measure metrics of progress and success that can then be organised into global indicators.

1. By 2025, enhance the integration and accessibility of priority datasets to inform sustainable and equitable economic decisions. Indicators include the percentage of relevant data made accessible, adoption of ocean access policies and inclusion of equity data, the level of data interoperability achieved, development of ocean accounts and the contribution of private sector entities to the data ecosystem.
2. By 2027, implement capacity-developing initiatives that empower stakeholders to participate in and contribute to a sustainable and equitable ocean economy, fostering a paradigm shift in perceptions and promoting inclusivity and interdisciplinary approaches. Indicators include the number of capacity-developing initiatives, the identification and reduction of participatory barriers, the number of participants trained, the level of institutional partnerships established, the assessment of skills and knowledge improvement among participants, and the engagement of private sector entities in promoting sustainable practices.
3. By 2028, develop and adopt sustainable policy frameworks and governance mechanisms that support equitable and environmentally responsible economic activities. Indicators include the adoption of relevant policies, legislation, regulations, integration of these frameworks into national and international agendas, tracking private sector compliance with sustainability standards and the incorporation of measures to reduce inequities and enhance inclusivity in the ocean economy.
4. By 2029, ensure inclusive and meaningful stakeholder engagement, reflecting a diverse array of perspectives in the planning and implementation of ocean economy strategies. Indicators include the diversity of stakeholders involved, the level of active participation, the incorporation of stakeholder perspectives into decision-making processes, and the specific inclusion of private sector collaboration to foster sustainable and equitable practices.
5. By 2030, mobilise and increase financing dedicated to supporting sustainable and equitable ocean economy initiatives, with a focus on innovative and nature-based solutions. Indicators include the total finance raised, the diversification of finance sources, adoption of sustainable finance principles, development of scalable finance mechanisms for community-level initiatives, the effective leveraging of resources through partnerships and collaborations, and the involvement of the private sector in financing sustainable ocean initiatives.

# References


Allison, E. H., Kurien, J., Ota, Y., Adhuri, D.S., Bavinck, J. M., Cisneros-Montemayor, A., Fabinyi, M., Jentoft, S., Lau, S., Mallory, T. G., Olukoju, A., Van Putten, I., Stacey, N., Voyer, M., Weeratunge, N. (2023). The Human Relationship with Our Ocean Planet. In: Lubchenco, J., Haugan, P.M. (eds) The Blue Compendium. Springer, Cham. https://doi.org/10.1007/978-3-031-16277-0_11

Blasiak, R., Jouffray, J. B., Wabnitz, C. C. C., Sundström, E., Osterblom, H. (2018) Corporate control and global governance of marine genetic resources. Science Advances 4: https://doi.org/10.1126/SCIADV.AAR5237/SUPPL_FILE/AAR5237_SM.PDF

Cicin-Sain, B. (2015). Conserve and sustainably use the oceans, seas and marine resources for sustainable development. UN Chronicle, 51(4), 32–33. https://doi.org/10.18356/8fcfd5a1-en

de Sanctis, C., Lamy, P., Letta, E., Pons, G., Pons, J.-F., Müller, M., Sack, K., Teleki, K., Thiele, T., Waite, A.M. (2022). Delivering a Sea - Change: A G7 Ocean Finance Deal. ORRAA/ Europe Jacques Delors G7 Policy Brief https://www.europejacquesdelors.eu/publications/europe-jacques-delors-institute--orraa-launch-report

Evans, A., Buchan, L., Fortnam, P. (2023). Putting coastal communities at the center of a sustainable blue economy: A review of risks, opportunities, and strategies. Frontiers in Political Science: https://doi.org/https://doi.org/10.3389/fpos.2022.1032204

Food and Agriculture Organization (FAO). (2015). Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication. The SSF Guidelines. Rome.

Food and Agriculture Organization (FAO). (2022) The State of World Fisheries and Aquaculture 2022.Towards Blue revolution. The State of World Fisheries and Aquaculture 2022.

FAO, Duke University & WorldFish. (2023). Illuminating Hidden Harvests – The contributions of small-scale fisheries to sustainable development. Rome. https://doi.org/10.4060/cc4576en

Fritsch D., Heaps, L., Martinez Toral, K., Vestergaard, O. (2022). Financing the Sustainable Blue Economy, T20 Task Force 9: Global cooperation for SDG Financing. http://dx.doi.org/10.13140/RG.2.2.14022.55368

García-Soto, C., Caesar, L., Cazenave, A., Cheng, L., Cheripka, A., Durack, P. J., Evans, K., Halpern, D., Jewett, E. B., Kim, S. Y., Guancheng, L., Rigor, I., Schmidtko, S., Wang, J., & Zielinski, T. (2023, June 21). World Ocean Assessment II, Chapter 05, Trends in the physical and chemical state of the ocean. DIGITAL.CSIC. https://digital.csic.es/handle/10261/321604

Global Maritime Forum Getting to Zero Coalition. https://www.globalmaritimeforum.org/getting-to-zero-coalition/ambition-statement

Hanson, C., Frost, N., Potouroglou, M., Hollaway, E., Haugan, P.M., Schieve, P.W. (2020) 100% Sustainable Ocean Management: An Introduction to Sustainable Ocean Plans.

Hoegh-Guldberg, O. et al. (2015). Reviving the Ocean Economy: the case for action - 2015. WWF International, Gland, Switzerland., Geneva, 60 pp.

Hoegh-Guldberg, O., Northrop, E., Ashford, O., Chopin, T., Cross, J., Duarte, C., ... Tyedmers, P. (2023). The ocean as a solution to climate change: Updated opportunities for action.

IOC-UNESCO. (2021). The United Nations Decade of Ocean Science for Sustainable

Development (2021-2030) Implementation Plan. UNESCO, Paris (IOC Ocean Decade Series, 20.)

Jouffray, J., Blasiak, R., Norström, A. V., Österblom, H., & Nyström, M. (2020). The Blue Acceleration: The Trajectory of Human Expansion into the Ocean. One Earth, 2(1), 43–54. https://doi.org/10.1016/j.oneear.2019.12.016

Lewis, F., Saliman, A., Peterson, E. (2023). "Funding Trends 2023: Tracking the State of Global Ocean Funding." Our Shared Seas.

Lillebø, A. I., Pita, C., Rodrigues, J. G., Ramos, S., & Villasante, S. (2017). How can marine ecosystem services support the Blue Growth agenda? Marine Policy, 81, 132–142. https://doi.org/10.1016/j.marpol.2017.03.008

Narula, K., Pouponneau, A., Dyer, J., Spalding, M. J., Chauhan, P., Thiele, T. (2023) Generating Finance for Blue Economy Transition. In. Observer Research Foundation, India.

Noonan-Birch, R. (2023) Applying the SDGS in a framework to assess blue economy capacity of industry operators in Canada.

OECD. (2016), The Ocean Economy in 2030, OECD Publishing, Paris, https://doi.org/10.1787/9789264251724-en.

Österblom, H., C.C.C. Wabnitz, D. Tladi et al. 2020. Towards Ocean Equity. Washington, DC: World Resources Institute. Available online at www.oceanpanel.org/how-distribute-benefits-ocean-equitably

Otto, I. M., Reckien, D., Reyer, C. P. O., Marcus, R., Le Masson, V., Jones, L., ... Serdeczny, O. (2017). Social vulnerability to climate change: A review of concepts and evidence. Regional Environmental Change, 17, 1651-1662. https://doi.org/10.1007/S10113-017-1105-9

Pérez-Cirera, V., Cornelius, S., & Zapata, J. (2021). Powering nature: Creating the conditions to enable nature-based solutions. WWF.

Schuhbauer, A., Favoretto, F., Wang, T., Aburto-Oropeza, O., Sala, E., Millage, K. D., Cabral, R. B., Sumaila, U. R., Lucrezi, S., Hsu, A., Tighsazzadeh, M. N., De La Cruz, M. P., & Cisneros-Montemayor, A. M. (2023). Global economic impact of scuba dive tourism. Research Square (Research Square). https://doi.org/10.21203/rs.3.rs-2609621/v1

Sumaila, U. R., Walsh, M., Hoareau, K., Cox, A. D., Teh, L., Abdallah, P. R., Akpalu, W., Anna, Z., Benzaken, D., Crona, B., Fitzgerald, T. P., Heaps, L., Issifu, I., Karousakis, K., Lange, G. M., Leland, A., Miller, D., Sack, K., Shahnaz, D., . . . Zhang, J. (2021). Financing a sustainable ocean economy. Nature Communications, 12(1). https://doi.org/10.1038/s41467-021-23168-y

Thiele, T. (Editor). (2022) Innovative High Seas Finance Mechanisms for the future 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 (BBNJ), Gland, Switzerland, IUCN Headquarters: IUCN. 8 pages https://www.iucn.org/sites/default/files/2022-08/iucn-bbnj-policy-brief-finance-mechanisms-v03-final-web.pdf

Thiele, T., & Epps, M. (Editors). (2022). Saving the ocean and climate through innovative marine protected area finance mechanisms. Gland, Switzerland: IUCN Headquarters: IUCN.

Thiele, T., & Gerber, L. R. (2017). Innovative financing for the High Seas. Aquatic Conservation: Marine and Freshwater Ecosystems, 27, 89-99. https://doi.org/10.1002/AQC.2794

Townhill, B., Couce, E., Tinker, J., Kay, S., & Pinnegar, J. K. (2023). Climate change

projections of commercial fish distribution and suitable habitat around north western Europe. Fish and Fisheries, 24(5), 848–862. https://doi.org/10.1111/faf.12773

UNEP. (2019). UN Environment, Oceana and insurers issue first-ever guidelines to combat pirate fishing. https://www.unepfi.org/industries/insurance/un-environment-oceana-and-insurers-issue-first-ever-guidelines-to-combat-pirate-fishing/

UNGC. (2020). Practical Guidances for the UN Global Compact Sustainable Ocean Principles. https://unglobalcompact.org/take-action/practical-guidances-for-the-un-global-compact-sustainable-ocean-principles

USGCRP. (2018). Fourth National Climate Assessment. https://doi.org/10.7930/NCA4.2018

World Wildlife Fund (WWF). (2015). Principles for a Sustainable Blue Economy. 6 pp. https://wwfint.awsassets.panda.org/downloads/15_1471_blue_economy_6_pages_final.pdf

World Wildlife Fund (WWF). (2021). Navigating Ocean Risk: Shaping the Transition to a Sustainable Blue Economy, TNFD. 68 pp. In https://value-at-risk.panda.org/assets/file/BlueEconomy_SummaryReport_v06_MSG_compressed.pdf

## United Nations Decade of Ocean Science for Sustainable Development (2021-2030)

Proclaimed in 2017 by the United Nations General Assembly, the UN Decade of Ocean Science for Sustainable Development(2021-2030), provides a convening framework to develop the scientific knowledge and partnerships needed to catalyse transformative ocean science solutions for sustainable development, connecting people and our ocean. The Ocean Decade is coordinated by UNESCO's Intergovernmental Oceanographic Commission (IOC).

Established during the Preparatory Phase and to continue throughout implementation until 2030, the IOC's Ocean Decade Series will provide key documentation about this global initiative and aims to serve as a primary resource for stakeholders seeking to consult,monitor and assess progress towards thevision and mission of the Ocean Decade.

**oceandecade.org**

@UNOceanDecade

@unoceandecade

@UN Ocean Decade

@UN Ocean Decade

unesco

Intergovernmental Oceanographic Commission