



OPEN ACCESS

EDITED BY

Ibukun J. Adewumi,
University of Wollongong, Australia

REVIEWED BY

Antentor Hinton,
Vanderbilt University, United States
Florian Rabitz,
Kaunas University of
Technology, Lithuania

*CORRESPONDENCE

Ibrahim Issifu
✉ i.issifu@oceans.ubc.ca

†These authors have contributed
equally to this work

SPECIALTY SECTION

This article was submitted to
Comparative Governance,
a section of the journal
Frontiers in Political Science

RECEIVED 11 October 2022

ACCEPTED 09 December 2022

PUBLISHED 13 January 2023

CITATION

Issifu I, Dahmouni I, Deffor EW and
Sumaila UR (2023) Diversity, equity,
and inclusion in the Blue Economy:
Why they matter and how do we
achieve them?
Front. Polit. Sci. 4:1067481.
doi: 10.3389/fpos.2022.1067481

COPYRIGHT

© 2023 Issifu, Dahmouni, Deffor and
Sumaila. This is an open-access article
distributed under the terms of the
[Creative Commons Attribution License
\(CC BY\)](#). The use, distribution or
reproduction in other forums is
permitted, provided the original
author(s) and the copyright owner(s)
are credited and that the original
publication in this journal is cited, in
accordance with accepted academic
practice. No use, distribution or
reproduction is permitted which does
not comply with these terms.

Diversity, equity, and inclusion in the Blue Economy: Why they matter and how do we achieve them?

Ibrahim Issifu^{1*†}, Ilyass Dahmouni^{1†}, Eric Worlanyo Deffor^{2†} and U. Rashid Sumaila^{1†}

¹Fisheries Economics Research Unit, Institute for the Oceans and Fisheries, University of British Columbia, Vancouver, BC, Canada, ²Ghana Institute of Management and Public Administration, Accra, Ghana

The Blue Economy (BE) has captured the attention of diverse interests to the ocean and there is rising concern about making it more equitable and inclusive. As it currently stands, diversity, social equity, and inclusion considerations have not been foregrounded in the discourse surrounding the BE and are continuously overlooked and undervalued. This paper reviews the ongoing social inequalities in the BE and distribution of benefits and costs across different groups in society. It also explores why equity matters, and how it can be achieved. Mirroring the call for under-represented or marginalized social groups to receive a fair share of the returns, which may be more than they have received to date. Our analysis shows that between 1988 and 2017, a Germany-based company has registered about 39% of all known marine genetic resources, while three companies in Asia control 30% of the market share of seafood sector in 2018. These findings show high consolidation of the ocean space by top corporations. Therefore, this paper argues that the exclusion of equity considerations within the BE investments can undermine ocean-based activities such as marine wildlife conservation initiatives that may disrupt the ocean sustainability agenda.

KEYWORDS

Blue Economy, ocean sustainable development, sustainable Blue Economy, gender, diversity, equity, inclusion

1. Introduction

There is widespread recognition that the ocean is a global common, where transboundary and commercial use of ocean activities such as fishing (e.g., Sumaila et al., 2020), cruise tourism, shipping, and fossil fuel extraction accelerates. In this study, we see the Blue Economy (BE) as equity-focused but we frequently utilize the term interchangeably with ocean economy, which refers to ocean-dependent economic activities. Increasingly, academics and policy makers perceive the “BE or Ocean Economy” to be a useful concept to help conserve the seas and oceans (Lee et al., 2020). Yet the BE is vastly inequitable where corporate and national consolidation of resources are stark and pervasive. Globally, about 82 percent of fishing activity is

carried out by just 25 countries, while 97 percent of marine genetic resources have been patented by companies domiciled in just 10 rich countries (Blasiak et al., 2018; Österblom et al., 2020). In turn, the largest 100 companies, referred to as the “Ocean 100,” collectively generate 60 percent of gross revenues. In a recent study, Virdin et al. (2021) found that only ten companies account for 45% of the gross revenues of each of the eight major ocean industries (i.e., fish processing, tourism, shipping, port infrastructure & services). Vessels from ten rich nations, including Korea, Japan, and Spain, take 71% of fishing catches from the high seas (Sumaila et al., 2015; Sala et al., 2018). This magnitude of aggregation in the ocean economy offers opportunities as well as poses risks to securing equity in the use of the global ocean. Mounting evidence demonstrates that the BE is inequitably used (Bennett et al., 2019; Österblom et al., 2020; BCCIC, 2021; Cisneros-Montemayor et al., 2021). Besides, recent proof from the fishing sector globally reveals how unrestrained development led to human-rights abuses, including food security and inadequate access to fisheries by local communities (Tickler et al., 2018; Singleton et al., 2019).

A BE aims at setting up environmentally sustainable, socially equitable, and economically viable ocean industry. However, what is not yet known is the role of Diversity, Equity and Inclusion (DEI) in the growth of the BE. DEI alongside economic development and environmental sustainability is recognized as central to a sustainable BE, and sustainable development more broadly (Cisneros-Montemayor et al., 2019). Until now, despite its importance, DEI have been largely overlooked in BE policies, discourses, and activities (Österblom et al., 2020; Bennett et al., 2021). In part, this may be due to limited understanding and the lack of guidance on what DEI means in practice, and how DEI goals and objectives might be institutionalized. This paper seeks to address these challenges by providing practical suggestions on why DEI matter, and how it can be achieved in BE governance. Although DEI touches all groups, this paper focuses primarily on women, otherwise systemically disadvantaged groups, racialized minorities with poor employment prospects, and inadequate infrastructure, and those at risk of suffering from environmental degradation and unsustainable BE development. However, it must be noted that this is not a “one size fits all approach,” rather, this paper is meant to offer a flexible approach that can be adapted to fit the context in which it is being applied. It aims to provide high level guidance to assist in ensuring DEI are thoroughly and comprehensively considered within BE governance.

2. Understanding the origin and discourses of BE terminology

The 2012 Rio + 20 conference first raised the idea of a BE and the need to stimulate “blue growth,” particularly for small island developing countries (SIDS) with significant maritime

and coastlines areas. Martínez-Vázquez et al. (2021) offer an extensive review of the Ocean Economy, Marine Economy, Blue Growth, BE, and Maritime Economy, and where the authors investigated various definitions of the terms used by authors. Given the growth potential of oceans, many Small Islands Developing States (SIDS) and coastal countries such as Mauritius and Seychelles have been strong advocates of BE, feature environmental sustainability and social equity in their vision (Cervigni and Scandizzo, 2017; Bennett et al., 2019, 2021). However, the lack of a generally accepted definition of what a BE is, what it incorporates, and what equitable and sustainable means has resulted in different organizations, actors, and industries around the world have defined it to encompass a wide variety of goals and motivations (Silver et al., 2015; Sumaila et al., 2021).

The concepts of circular, green, and BE share the same philosophy, which is to shift the existing economic practices in the direction of a more sustainable one. While the red economy is based on an unbalanced production system and inconsiderate consumption habits that do not place the natural environment at the center of industrial activities (Genovese et al., 2017). This is driving increasing attention to the sustainability of the marine *agri-sea-food* system. The growing demand for seafood products necessitates the expansion of the BE (Naylor et al., 2021) while minimizing detrimental ecological and social consequences (Issifu et al., 2022). To date, the economy has been redder than ever. The result is terrible and the impact on the environment is far from benign. As we move toward a less red economy, the seafood industry should become more sustainable. Achieving such a strategic goal of sustainable management will enable fishers to establish a bluer consumption system based on ocean-friendly practices, such as zero plastic policies. In addition, achieving DEI in the BE sector is linked to achieving DEI in the other sectors. The greener BE sector promotes green energy use, recycling and more inclusive profits. Implementing DEI is pivotal not only to the success of BE but also to the green and circular economies. For example, in the pursuit of cutting greenhouse gas emissions, the BE can contribute to this goal by assisting with carbon mitigation in ocean-related industries and infrastructure. Examples include smart ports that use data analytics to improve performance and economic competitiveness, for a review see Battino and del Mar Muñoz Leonisio (2022). In this regard, it must be recognized that the green and blue economies are centered on natural resources. Their successful implementation can be facilitated by the principle of the circular economy, as it will contribute to the efficient use of resources while stimulating and calling for innovative improvements that build better livelihoods for all fishers.

Green economy and BE have been subject to various definitions but those currently being adopted by development partners, civil society, and international organizations have a lot in common. Green economy strategies tend to focus largely

on terrestrial sectors such as energy, agriculture, and forestry (Silver et al., 2015) in order to improve human wellbeing and social equity, while drastically minimizing ecological scarcities and environmental risks (UNEP, 2011). Scholars and other groups in society argue that the terrestrial focus of the “green economy” did not adequately address the needs of frontline coastal communities who rely heavily on coastal resources for their jobs and livelihoods (Louey, 2022). This has led some to call for BE—an alternative way of recognizing the interconnected nature of the ocean to livelihoods, and the economy with a focus on the equitable use and distribution of marine resources (Cisneros-Montemayor et al., 2021, 2022). According to the European Commission, the BE involves all ocean related economic ventures which covers a wide range of interwoven including both emerging and established sectors (The Economist, 2015). The BE is seen as a rallying cry for the sustainable utilization of ocean resources for development, enhanced sustenance, and employment while conserving the health of ocean ecosystem (World Bank, 2017).

WWF adds that BE denotes any economic venture in the ocean sector, whether renewable or not, while for others, it encompasses everything from the historic fishing industry to tourism and shore side attractions like beaches to emerging industries such as marine biotech and wind energy and simply aims to use the ocean and its assets for sustainable economic growth (WWF, 2015; Sumaila et al., 2021). Yet, the notion progressed further at the BE conference in Abu Dhabi in 2014, where representatives of the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organization discussed the BE as a device to accelerate development in SIDS (SDG Knowledge Platform, 2014). Just as the green growth and green economy was once on the frontier of investment and development planning, its maritime-based equivalent has captured the imagination of the African Union, the European Union, Commonwealth Secretariat, policymakers, Organization for Economic Co-operation and Development (OECD), the United Nations, development finance organizations (such as the World Bank), and Non-Governmental Organizations (NGOs) alike.

However, global interest has focus on the ocean as a source of wealth was sparked by the seminal publication “The Ocean Economy in 2030” by the OECD (2016). They focus on the term “ocean economy” than the “BE” (see also Sumaila et al., 2021). In advancing the idea of a sustainable BE, all activities in the ocean, including the extraction of non-living resources, exploiting living resources, and the creation of new resources within the ocean must be done in a sustainable manner. How to stimulate economic growth in ocean nations or areas may be understood to many, but it is not clear how to make the BE more equitable and inclusive and under what policies and pathway is it most likely to develop.

We argue that central to the BE is DEI. As alluded to in Section 2 of this paper, these terms are often used

interchangeably. The term diversity can denote the presence of differences within a given context, such as an organization. It refers to groups rather than individuals. These may denote a wide characteristic, such as religion, race, gender, and sexual orientation. Although diversity is used more within a group context, the hiring of person can bring additional diversity to an organization or a group. The term equity involves a world in which all peoples can attain their potentials while contributing to the general good; they do not just only survive but flourish. The goal for promoting equity is to move beyond historical and systemic barriers that limit access in order to achieve greater fairness of outcomes. To comprehend how social justice or equity is, and is not, addressed in ocean planning, you first have to pay attention to the complex nature of equity. The four dimensions of equity include: procedural, distributional, recognition and contextual (Wells et al., 2021). Procedural equity involves participation in governance and inclusion in decision making whereas distributional equity involves the fair distribution of benefits and minimization of burdens (Österblom et al., 2020; Hicks et al., 2022). Recognition equity incorporates the recognition and respect of diverse knowledge systems, values, and social norms (Bennett et al., 2019). It also involves recognizing the diversity of ocean actors and their rights. The fourth dimension is contextual equity, which highlights the fact that to understand what is equitable requires understanding the context and history of specific places and the context specific situations that people face (Alexander et al., 2021; Cisneros-Montemayor et al., 2022). Contextual equity therefore denotes the broad socio-economic and cultural contexts, including aspect of the past and present that influence the capacity of an actor to participate in decision-making, ensure fair distribution, and gain recognition. For example, ethnicity, power dynamics, age, gender, and education should play a role (Wells et al., 2021). Inclusion on the other hand, relates to specific actions taken to leverage the unique strengths of all peoples. The goal is to ensure that individuals feel welcomed, valued, and supported with their environment. Inclusions therefore goes beyond ensuring representation. It captures the level of participation and empowerment individuals have within a given setting. We establish from the literature that inclusion is not necessarily an output of diversity, in others words, inclusion is not a natural consequence of diversity or promoting diversity would not necessarily result in inclusion. The focus of DEI efforts will vary depending on the sector of the BE and the type of organizational culture. For example, while some organizations tend to pay more attention to individual characteristics such as gender, gender identity, age, race, sexual orientation, disability, and religion, other organizations may place emphasis on diversity of thought or cognitive diversity.

Globally, nations are looking to transition to a “green” economy with low-carbon technologies, socially inclusive and resource efficient governance systems (KPMG, 2021). The green agenda is central to achieving over-arching broader social equity

ambition outlined in the 2030 United Nations Agenda for Sustainable Development. Green economy demonstrated gains in job quality especially ocean-related jobs, promoted social inclusion and reductions in poverty (ILO and International Institute for Labour Studies, 2012). For these reasons, incorporating DEI in the “green” component of the “blue” transition will not only facilitate a more equitable sustainable ocean economy but will also lead to thriving ecosystems, communities and individuals.

3. Existing social inequities in the BE

The BE is already a powerful economic engine for most countries in the world today. The OECD projects that the ocean economy will likely expand faster than the world economy from 2010 to 2030, contributing to general expectations of an unmatched period of blue growth (Jouffray et al., 2020). Specifically, it is estimated that the BE will contribute about \$100 billion per year to the economies of coastal and island nations. Oceans and coasts are expected to add \$25 billion worth of ecosystem services through economic activities such as nutrient cycling, coastal protection and carbon dioxide absorption by 2025. A final example of the high expectations from the ocean economy is that it is expected to expand three times faster than Australia’s total gross domestic product over the next 10 years (Coffin, 2015).

However, the ocean economy is fraught with a suite of social inequities and inequalities. Anecdotal evidence shows existing marginalized groups such as indigenous peoples, women, small scale fishers, low-income earners, otherwise systemically disadvantaged groups, racialized minorities, coastal communities, and remote populations with poor employment and infrastructure at risk of environmental degradation and unsustainable development. Black Americans and Black Canadians and Indigenous peoples are disproportionately more likely to live near industrial areas and are exposed to higher levels of toxins than other citizens (Bullard, 2007), both through the environment and through consumption of fish (Cisneros-Montemayor et al., 2016; Stackelberg et al., 2017). Fisheries with predominantly Black and Indigenous fishers are threatened more by climate change resulting high impact and anxiety among Black, Indigenous, and People of Color (BIPOC) generally (American Fisheries Society, 2015).

Historically, indigenous communities are inherent rights-holders to marine areas and resources and have managed these areas sustainably over millennia in keeping with their own laws and customs (BCCIC, 2021). Yet indigenous peoples have been ignored from decision-making pertaining to the ocean because indigenous rights were shortchanged and marginalized when European settlers colonized North America and imposed their own legal systems (BCCIC, 2021). According to BCCIC (2021), the Canadian government dismantled

Indigenous traditional governance systems and imposed strict regulations on the lives of Indigenous peoples through treaties and statutes such as the Fisheries Act (1868) and The Indian Act (1876). A considerable amount of literature argues for a different approach, where power dynamics and social inequities must be addressed first given that they are at the root of both unsustainable use of natural resources and inequitable distributions of economic gains (Bennett et al., 2019; Cisneros-Montemayor et al., 2022). The legacies of inequitable power dynamics caused by colonial legislation are still in effect today. For example, in 2018, about 70% of families in the Nunavut, and the Inuvialuit Settlement Region of the Northwest Territories of Canada faced food insecurity (BCCIC, 2021). These inequities are a result of final decision-making authority associated with natural resource management and economic development activities that occur on unceded or Treaty Indigenous lands and waters is legally held by Crown governments. In some cases, whole communities were forced to relocate further North where hunting and fishing opportunities were scant compared to their home territories (BCCIC, 2021). Food insecurity remains a source of social injustice and a key social driver of health, including jobs, education, income, racism, and gender. This places people who are part of historically marginalized groups at higher risk of food insecurity, including sexual orientations and gender identities known as 2SLGBTQ+ groups. In the same vein, in Africa, Namibia’s colonial era saw significant exploitation of the country’s minerals likewise the overutilization of the country’s fish stocks under both the German colonialization and South African apartheid rules (Sumaila and Vasconcello, 2000). Carver (2020) observed historically disenfranchised voices and the lack of local ownership in Namibia due to the continued dominance of white elites in the ocean economy.

The industrialization and subsequent privatization of ocean resources has resulted in the dominance and consolidation of a small group of transnational corporations (TNCs), hence a few companies control a huge market share of the total output or sales of marine products or service (Gereffi, 2014; Folke et al., 2019). Although transnational in operations, the site of the headquarters of the transnationals corporations (TNCs) can give indications of the geographic distribution of benefits from the ocean economy. Selig et al. (2019) mapped the degree of human dependence on marine ecosystems based on the magnitude of the benefit, susceptibility of people to a loss of that benefit, and the availability of alternatives, and found the top 5 countries (Indonesia, Nigeria, Philippines, Vietnam, and Myanmar) with the high proportion of their populations with high dependence in term of nutrition, economic, and coastal protection. Sadly, none of the headquarters of the TNCs is located in any of the top 5 countries with the highest numbers of people with high dependence on marine ecosystem. The United States, Saudi Arabia, China, Norway, the United Kingdom, France, and Iran, South Korea, the Netherlands, Brazil, and Mexico are among

the TNCs countries with the largest share of the gross revenues generated (Viridin et al., 2021). The United States has close to 12%, Saudi Arabia and China 8%, respectively, Norway has 7%, France 6%, the United Kingdom 5%, and Iran, South Korea, the Netherlands, Mexico, and Brazil (4% each). Saudi Arabia, Iran, Brazil, Mexico, and the United States collectively host the largest offshore oil and gas TNCs. Also, China, South Korea, and Italy host the largest maritime construction and equipment companies (Viridin et al., 2021). Huge amounts of consolidation in the ocean economy pose danger to attaining globally shared goals for sustainability by contributing to inadequate access to ocean resources (Sumaila et al., 2015; Österblom et al., 2020).

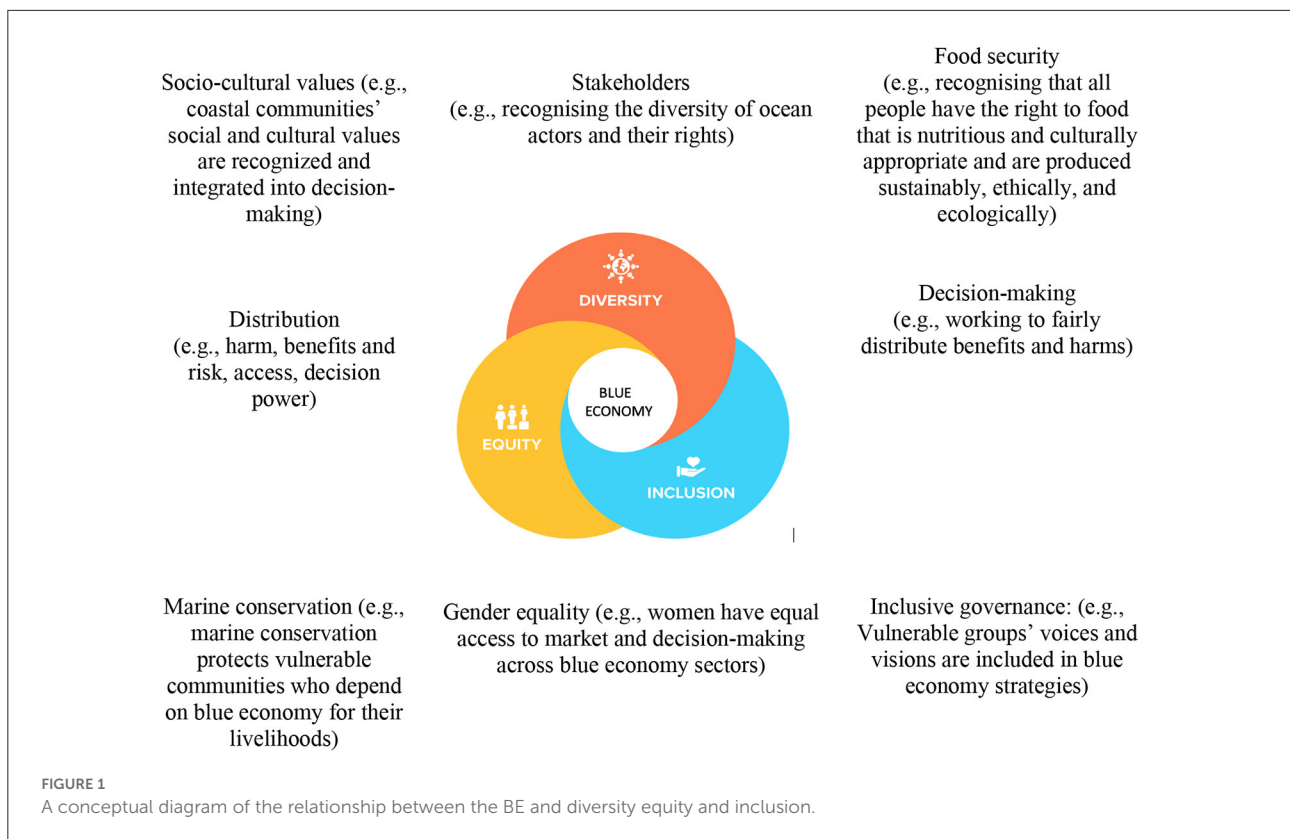
Globally, women depend on the ocean for livelihood, coastal protection and food (Selig et al., 2019; Harper et al., 2020). Although close to 85 percent of the workforce in the sector are women, they are not accounted for in fisheries management positions (Harper et al., 2018), hence policies tend to undermine their livelihoods (WWF, 2012). The exclusion of women from decision-making about ocean can increase their vulnerability and affect their rights and wellbeing (Selig et al., 2019; Harper et al., 2020). To ensure the inclusion of women and other vulnerable groups, local communities should not be ignored from decision-making relating to ocean development and management. These challenges often emanating from social conventions restrain the purchasing power of women to secure better equipment and boats to explore new fishing grounds. In recent years, the term “ocean grabbing” has become a great source of concern since they affect the rights and livelihoods of vulnerable coastal peoples and small-scale fishers. “Ocean-grabbing”—constitutes shrouded access agreements that hurt small-scale fishers, incursions into protected waters, unreported catch, and the diversion of resources away from local communities (Bennett et al., 2015).

4. Why the need for DEI in BE?

Several studies have highlighted the business case for diversity and inclusion, companies or entities that focus on diversity and inclusion, and add equity, repeatedly outperform those that do not, with regards to profits, innovation, creativity, reputation, and productivity (e.g., Bourke and Dillon, 2018; Dixon-Fyle et al., 2020). Other potential benefits of DEI in BE context include provision of alternative livelihoods, revitalization of coastal economies, improved food security and well-being and ensuring fair socio-economic policies (OECD, 2016; Michel, 2017). In addition, blue foods are less affordable where gender inequality is higher (Hicks et al., 2022). DEI offers suggestions as to how to better achieve sustainable results, including economic viability (Schuhbauer and Sumaila, 2016) and environmental integrity (Pauly et al., 2002). By looking at DEI approaches, we can ensure a fair distribution of benefits over a longer term, such that ocean resources are conserved and delivered for future generations (Sumaila and

Walters, 2005; Cisneros-Montemayor et al., 2021; Sumaila, 2022). A recent study by Cletus et al. (2018) reported that while diversity in the workplace fosters the acquisition of many professional skills, such as critical thinking and problem solving, it also helps with the improvement of productivity, organizational attractiveness and talent retention. Equity issues merit upfront attention and when they are overlooked, they can have effect on how well other objectives are attained. Figure 1 presents the relationship between DEI and BE in a conceptual framework.

For example, ocean planning in California was unsuccessful when equity issues were overlooked, however, this was resolved by the Marine Life Protection Act (MLPA) process in the state. The use of a top-down approach during the initial phase of the planning failed to involve stakeholder groups, this made the process unsuccessful. However, in the third phase of the initiative, planners engaged various stakeholders, encouraged participation and gave voice to the affected members, and the planning led to a network of MPAs along the whole California coast (De Santo and Yaffee, 2021). On Mafia Island, Tanzania, the lack of consultation with the local community of fishers before the established of an MPA by NGO almost ruined the conservation effort (Sumaila et al., 2000). Other good examples of situation where the introduction of equity consideration in ocean planning are in the development of Individual Transferable Quotas (ITQ) for bad-performing fisheries. Decisions about how to apportion quotas when the ITQs are first set up, and the rules concerning how quotas can be consolidated after the system is established can have profound outcomes for fishery performances (De Santo and Yaffee, 2021). In many Pacific Island states, inclusion is critical in the implementation of ocean governance because of poor ocean management owing to the lack of gender-disaggregated ocean data (Michalena et al., 2020). Michalena et al. highlight the relevance of Pacific women’s knowledge of Pacific Ocean ecosystems as it differs from that of other groups. We argue that a broad-based and concerted approach that includes civic institutions, academics, industry partners, and individual change agents can enhance the recruitment, retention and integration of underrepresented and marginalized people into the BE by facilitating focused strategies across the entire mentoring system. Especially, a number of positive factors have been demonstrated to foster increased minority engagement throughout mentoring approaches such as (1) active support for training and skills development programs for new and existing workers in the various sectors of BE, including specific programs for under-represented groups and Indigenous peoples (Fisheries and Oceans Canada, 2022); (2) making available role models or having mentors (Indigenous Guardian Program); (3) participation in afterschool and summer learning DEI-related subjects such as gender equity, equitable distribution of benefits, intergenerational equity, and recognizing Indigenous rights holders and their distinctive role in the BE.



5. International and national-level legal and regulatory actions

The UN Convention on the Law of the Sea’s (UNCLOS) core mandate involves setting a legal framework to regulate all marine and maritime activities such as the conservation and sustainable use of marine biodiversity in the areas beyond a nation’s Exclusive Economic Zone (EEZ), where no single nation claims sole ownership and management. In 2017, UNCLOS has also established a new resolution 72/249 (United Nations, 2018), which seeks to integrate the common heritage of mankind, inter-generational equity and benefit sharing as legally binding instruments to protect, preserve and conserve marine biological diversity in the high seas, i.e., areas beyond the EEZs of coastal countries. This new ongoing treaty seeks to address issues of ocean equity and ensure equitable access to marine resources for land–locked, developing and geographically disadvantaged nations. We found that between 1988 and 2017, one company based in Germany has registered about 39% of all known marine genetic resources, while three Asia–based companies control 30% of the market share of seafood sector in 2018 (see [Supplementary material](#)) raising questions about the principle of common heritage of mankind to marine genetic resources. To paraphrase Arvid Pardo’s, man’s penetration of the deep ocean could be a unique opportunity to lay solid foundations

for a share future prosperity for all (Tladi, 2014). In addition, as developing nations and small island developing states face legal and technical capacity restrictions and have been marginalized in some international negotiations (Blasiak et al., 2016, 2017), raising concerns about equity in the setting of negotiations is important to increasing ocean equity. Capacity-building for marginalized communities in turn enhances greater equity (Österblom et al., 2020).

Most Governments and NGOs around the world are relentlessly pursuing legislation to make corporate bodies and stakeholders deliver social benefits to all peoples. Many nations have crafted national legislation to address DEI, for instance, in Canada the Canadian Business Corporation Act mandates federally distributing companies and corporations to reveal information on four designated groups i.e., women; persons with disabilities; aboriginal peoples; and members of visible minorities. Besides the UN new resolution 72/249, regional and national legislation, universities, and financial regulators are also introducing disclosure rules around DEI. [Table 1](#) presents an overview of national level legal and regulatory actions. We see from the Table that the California Corporations Code, as modified by Assembly Bill 979 requires companies and corporations to hire at least one person from a marginalized community on its board of directors by the end of 2021.

TABLE 1 DEI indicators embedded in legal and regulatory development.

Country	Actions/acts	Summary
Canada	The Impact Assessment Act (Bill C–69)	<ul style="list-style-type: none"> o This act outlines consideration of issues of diversity, equity and inclusion. The Act transforms existing inequalities and unequal power relations in communities
Chile	Chilean Labor Code (Law No.21, 275)	<ul style="list-style-type: none"> o Corporations must: 1. Maintain at least 1 employee, with specific knowledge that promote the labor inclusion of people with disabilities. 2. Promote internal policies on matters of inclusion. 3. Annually inform those policies through a communication to the Labor Board. 4. Develop and implement annual training programs for an effective labor inclusion. 5. Consider the rules on equal opportunities and social inclusion of people with disabilities from law No. 20,422 in all activities outside workdays
Finland	Non-discrimination Act 1325/2014	<ul style="list-style-type: none"> o The aim of the Act is the promotion of equality, the prevention of discrimination and improving the protection provided by law to discriminated groups
Iceland	Act on Equal Status and Equal Rights Irrespective of Gender, No. 150/2020	<ul style="list-style-type: none"> o This Act seeks at setting up and maintaining equal status and equal opportunities for people. It encourages gender equality in all aspects of society. All people shall have equal right and opportunities to derive material benefit from their own economic activities and to develop their skills irrespective of gender
Portugal	Social Balance Law 7/2009 (Article 31)	<ul style="list-style-type: none"> o Equal working conditions where the employees have the right to equal remuneration for work of equal value. Moreover, no differences in job description and remuneration shall be based on objective criteria, common to men and women
South Africa	Broad-based Black Economic Empowerment Act	<ul style="list-style-type: none"> o The Act was introduced with the goal to establish a legislative framework for the promotion of black economic empowerment vis: 1. Ownership (Direct Empowerment), 2. Management Control (Indirect Empowerment), 3. Enterprise Development 4. Skills Development and 5. Socio-Economic Development
Spain	Organic Law 3/2007 for the effective equality of women and men	<ul style="list-style-type: none"> o The Act established new legislative measures concerning violence against women in relation to sexual harassment in the workplace, gender violence, and the right to asylum and refugee status for foreign women
United Kingdom	The UK Gender Pay Gap Reporting Act	<ul style="list-style-type: none"> o All voluntary-sector employers and private entities with 250 or more workers are required to disclose data on their gender pay gap
US, State of California	California Corporations Code, as modified by Assembly Bill 979	<ul style="list-style-type: none"> o By this Bill, companies are required to hire at least one person from a marginalized groups on its board of directors by the end of 2021

6. More DEI in BE would help deliver the UN sustainable development goals

Decolonisation of development and the need for transformative change to challenge racial, gendered, colonial, and capital biases in global economic frameworks is high on the development agenda (Sultana, 2022). The Sustainable Development Goals (SDGs) highlights the importance of inclusivity as a strong framework for assessing progress regarding the performance of the sustainable BE. It addresses the multi-dimensional inequalities associated with development in the area of gender, age, and ethnicity without exacerbating or perpetuating existing inequalities (Gupta and Vegelin, 2016). Giving the intersections between the social SDGs and SDG 14, pursuing Goals 1 (eradicating poverty), 2 (eradicating hunger), 5 (gender equality), and 7 (clean energy) are all relevant to inclusive outcomes, likewise SDG 14, which is on

the oceans (Singh et al., 2018). Ocean based renewable energy is fast-growing and, on the path, to becoming a key source of energy for the world (IOC–UNESCO, 2021). It is important to consider how these marine energy sources might contribute to a sustainable and equitable ocean economy. By embracing the concept of equity in the BE, the marine energy sector can make transformative contributions to coastal communities. The reverse would lead to development that is socially and/or ecologically harmful and exacerbates inequalities. There are also positive interactions between SDG 7 and other SDGs, including those that promote strengthening infrastructure and economic wellbeing through innovation. We also found that adopting DEI considerations in BE means that harnessing the power of the ocean is done in ways that address the varied resources, diverse needs and concerns of local communities. This understanding allows us to both widen the opportunities for marine energy developers, and it also encourages the sector to engage in equitable and sustainable development as a foundation of renewable ocean energy for in a BE. Table 2 provides an

TABLE 2 Ocean-related SDGs are pivotal to accomplishing the DEI practices needed to power the BE.

Ocean related sustainable development goal (SDG)	DEI practices needed to power BE development
SDG 2: End hunger, achieve food security, and improved nutrition	Achieve food security within marginalized communities by supporting the economic development of new aquaculture species in sustainable domestic and global food production—so that coastal communities and historically underserved people have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy lifestyle
SDG 3: Ensure healthy lives and promote wellbeing for all people	Strengthen access to clean water and develop new inclusive social protection systems in underserved communities. Support investments in health, and fiscal strategies that ensure a healthier, sustainable BE
SDG 5: Gender equality	Achieve gender equality and empower all women and girls involved in small-scale fisheries. Design policies and program incentives to increase gender equity. Prioritize the socio-economic wellbeing of women and girls by promoting equity in the labor market
SDG 7: Ensure access to affordable and clean energy for all	Create strong energy-equity metrics, incorporating voices from historically underserved communities in the creation of energy systems and technologies and advancing equitable distribution of energy at scale to address underrepresented communities
SDG 9: Foster innovation by building resilient infrastructure, and promote inclusive and sustainable industrialization	Build resilient and modern marine infrastructure, including live storage tanks, ports, and seafood processing plants. Resolve systemic inequities for historically underserved communities by collaborating with indigenous peoples and other minorities to ensure consistent decision making
SDG 11: Make cities and communities inclusive, safe and sustainable	Leaving no one behind requires more investment to reduce coastal slum dwellers and make cities more resilient to climate change impacts and maintain coastal environmental health. Support actions to challenge discrimination, stereotypes, and promote inclusive and equal opportunity in housing.
SDG 12: Ensure sustainable consumption and production patterns	Support the elimination of waste streams that enter marine ecosystems through the superior design of products, materials, and systems. Respect and recognize the legitimate expectation of future generations and fosters equitable interventions that allow for inclusion in decision-making processes, and strengthens equity with transparency to empower racialized and minorities communities
SDG 13: Take urgent and uniform global action to address climate change and its impacts	Ensure global climate plan to get to net-zero through the international commitments to ocean health. Increase actions to protect, restore, and rebuild aquatic resources and marine ecosystems, including wild fish stocks. Protect and support the resilience of frontline coastal economies and livelihoods, and provide alternative livelihoods, for those disproportionately affected by climate change
SDG 14: Life below water	Protecting the needs of the present people without “compromising the ability” of the ocean to meet the needs of the future generations. Specifically, intergenerational equity needs to be considered to make BE equitable and sustainable
SDG 16: Peace, justice, and strong institutions	Provide access to justice for coastal and minorities communities by means of accountable and inclusive institutions at all levels. Bring the unique knowledge of indigenous peoples and other diverse voices in decision making
SDG 17: Strengthen the global partnership for sustainable development	Facilitate global cooperation in implementing effective capacity-building in small island developing countries (SIDS) and other developing economies to support national plans to implement ocean-related sustainable development goals

overview of how Ocean-related SDGs are pivotal to facilitating the DEI practices needed to power the BE. For instances, we observed that SDG 7: Ensure access to affordable and clean energy for all people may improve BE through creating strong energy-equity metrics, incorporating voices from historically underserved communities in the creation of energy systems and technologies, and advancing equitable distribution of energy at scale to address underrepresented communities. We propose transformative actions for DEI (Table 3).

7. Conclusion

The oceans have the potential to significantly contribute to decreasing global malnutrition and hunger (Srinivasan et al., 2010; Hicks et al., 2019) and with a lower carbon footprint, which would help decrease the contribution of the food systems to global warming (Béné et al., 2015; Farmery et al., 2020;

Sumaila and Tai, 2020). Huge potentials can be achieved within a BE that enhances benefits alongside the fair and sustainable use of ocean resources. But, the current trend of the BE focusing on output and only profit is leading to the over-consolidation of BE narratives by private corporations' interests, to the neglect of marginalized voices calling for equitable distribution of ocean resources. Solving inequities present in the BE is important by ensuring that the voices of under-represented groups and people of different genders and backgrounds are heard alongside with all others. In this paper, we assessed how renewable ocean energy could contribute to an equitable BE. We began our analysis by providing a comprehensive analysis of the terminology involved in this study, and then discussed the rationale for DEI and the reason why everyone should be at least concerned, if not involved in ensuring DEI in the BE. As mentioned, the assessment of current inequalities represents a big missing piece of the DEI puzzle. What does it take to make the BE equitable?

TABLE 3 Recommendations for advancing DEI in BE.

Diversity actions
<ul style="list-style-type: none"> Recruitment of Indigenous and racialized individuals into senior positions or creating new positions for Indigenous and racialized peoples within the BE will foster relationships with minorities partners, support cultural safety initiatives and ultimately, work toward building sustainable BE Incentivize increased diversity in training, education and sectors
<ul style="list-style-type: none"> Recognize that there are no one-size-fits-all” solutions and the diversity of stakeholders in the BE has to be taken into account
<ul style="list-style-type: none"> Ensure that Gender Based Analyses are culturally relevant and enforceable across all BE programs, policies, and legislation
<ul style="list-style-type: none"> The current BE is over-consolidated among a small group of corporations. We must put people ahead of profit in development of the BE
Equity actions
<ul style="list-style-type: none"> Food security: Ocean development projects respect local communities need to fish as food
<ul style="list-style-type: none"> Benefits sharing: Ensure that economic benefits from ocean industries are fairly distributed to local communities
<ul style="list-style-type: none"> Develop and enhance existing equity data collection, reporting, compilation, and analyses
<ul style="list-style-type: none"> Fisheries Management: Ensure that small scale fishers’ livelihoods are protected, and that they have access to decision-making in ocean development
Inclusion actions
<ul style="list-style-type: none"> Inclusive governance: Include marginalized groups’ voices and visions in ocean strategies and governance Inclusive science: To make science more just and inclusive, open source is the answer to speeding up innovation—not patents and paywalls
<ul style="list-style-type: none"> Leave no-one behind: Advance the participation of indigenous people and under-represented population
<ul style="list-style-type: none"> Develop inclusion tools: Factors such as age, income, gender, ability, and ethnicity and measuring inclusion must be taken into account in developing the BE
<ul style="list-style-type: none"> Raise awareness of BE opportunities and connect marginalized populations and racialized minorities with these opportunities

We argued that indigenous communities and all coastal states need to be treated fairly. Also, we highlight the existing inequalities and inequities due to inadequate DEI practices in the BE. We conclude that BE activities should work toward achieving SDG14, while concurrently working to meet the other ocean-related SDGs. The current study established the potential benefits derived from renewable ocean energy needs

References

- Alexander, K. A., Fleming, A., Bax, N., Garcia, C., Jansen, J., Maxwell, K. H., et al. (2021). Equity of our future oceans: practices and outcomes in marine science research. *Rev. Fish Biol. Fish.* 32, 297–311. doi: 10.1007/s11160-021-09661-z
- American Fisheries Society (2015). *The Gullah/Geechee Fishing Association*. Available online at: <https://fisheries.org/2015/07/the-gullahgeechee-fishing-association/> (accessed November 12, 2022).
- Battino, S., and del Mar Muñoz Leonisio, M. (2022). “Smart ports from theory to practice: a review of sustainability indicators,” in *International Conference*

to be considered in regional contexts to ensure equitable and sustainable developments. For example, marine energy could have synergistic benefits with SDG 6: Clean water and sanitation. We suggest recommendations with specific DEI actions. Finally, we incorporate DEI Practices needed to power BE development within the context of ocean-related SDGs.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Acknowledgments

We are grateful to members of the Fisheries Economic Research Unit for reviewing an early manuscript and provided useful advice. US and II thank the OceanCanada and the Solving FCB Partnerships sponsored by the Social Sciences and Humanities Research Council of Canada (SSHRC).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher’s note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpos.2022.1067481/full#supplementary-material>

on *Computational Science and its Applications* (Cham: Springer), 185–195. doi: 10.1007/978-3-031-10548-7_14

BCCIC (2021). *Achieving Equity in Canada’s Blue Economy: Ensuring No One Gets Left Behind in Canada’s Blue Economy Strategy*. Available online at: <https://www.bccic.ca/equity-in-blue-economy-canada/> (accessed November 21, 2022).

Béné, C., Barange, M., Subasinghe, R., Pinstруп-Andersen, P., Merino, G., Hemre, G., et al. (2015). Feeding 9 billion by 2050 – Putting fish back on the menu. *Food Sec.* 7, 261–274. doi: 10.1007/s12571-015-0427-z

- Bennett, N. J., Govan, H., and Satterfield, T. (2015). Ocean grabbing. *Mar. Policy* 57, 61–68. doi: 10.1016/j.marpol.2015.03.026
- Bennett, N. J., Blythe, J., White, C. S., and Campero, C. (2021). Blue growth and blue justice: ten risks and solutions for the ocean economy. *Mar. Policy* 125, 104387. doi: 10.1016/j.marpol.2020.104387
- Bennett, N. J., Cisneros-Montemayor, A. M., Blythe, J., Silver, J. J., Singh, G., Andrews, N., et al. (2019). Towards a sustainable and equitable Blue Economy. *Nat. Sustain.* 2, 991–993. doi: 10.1038/s41893-019-0404-1
- Blasiak, R., Durussel, C., Pittman, J., Sénit, C. A., Petersson, M., and Yagi, N. (2017). The role of NGOs in negotiating the use of biodiversity in marine areas beyond national jurisdiction. *Mar. Policy* 81, 1–8. doi: 10.1016/j.marpol.2017.03.004
- Blasiak, R., Jouffray, J., Wabnitz, C., Sundström, E., and Österblom, H. (2018). Corporate control and global governance of marine genetic resources. *Sci. Adv.* 4, eaar5237. doi: 10.1126/sciadv.aar5237
- Blasiak, R., Pittman, J., Yagi, N., and Sugino, H. (2016). Negotiating the use of biodiversity in marine areas beyond national jurisdiction. *Front. Mar. Sci.* 3, 224. doi: 10.3389/fmars.2016.00224
- Bourke, J., and Dillon, B. (2018). The diversity and inclusion revolution: Eight powerful truths. *Deloitte Rev.* 22, 82–95. Available online at: <https://www2.deloitte.com/us/en/insights/deloitte-review/issue-22/diversity-and-inclusion-at-work-eight-powerful-truths.html> (accessed November 3, 2022).
- Bullard, R. D. (2007). Dismantling environmental racism in the USA. *Int. J. Just. Sustain.* 4, 5–19. doi: 10.1080/13549839908725577
- Carver, R. (2020). Lessons for blue degrowth from Namibia's emerging Blue Economy. *Sustain. Sci.* 15, 131–143. doi: 10.1007/s11625-019-00754-0
- Cervigni, R., and Scandizzo, P. L. (2017). *The Ocean Economy in Mauritius: Making It Happen, Making It Last*. Washington, DC: World Bank. Available online at: <https://openknowledge.worldbank.org/handle/10986/28562> (accessed June 20, 2022).
- Cisneros-Montemayor, A. M., Croft, F., Issifu, I., Swartz, W., and Voyer, M. (2022). A primer on the 'Blue Economy': promise, pitfalls, and pathways. *One Earth* 5, 982–986. doi: 10.1016/j.oneear.2022.08.011
- Cisneros-Montemayor, A. M., Moreno-Báez, M., Reygondeau, G., Cheung, W. W., Crossman, K. M., González-Espinosa, P. C., et al. (2021). Enabling conditions for an equitable and sustainable Blue Economy. *Nature* 591, 396–401. doi: 10.1038/s41586-021-03327-3
- Cisneros-Montemayor, A. M., Moreno-Báez, M., Voyer, M., Allison, E. H., Cheung, W. W., Hessing-Lewis, M., et al. (2019). Social equity and benefits as the nexus of a transformative Blue Economy: a sectoral review of implications. *Mar. Policy* 109, 103702. doi: 10.1016/j.marpol.2019.103702
- Cisneros-Montemayor, A. M., Pauly, D., Weatherdon, L. V., and Ota, Y. (2016). A global estimate of seafood consumption by coastal indigenous peoples. *PLoS ONE* 11, e0166681. doi: 10.1371/journal.pone.0166681
- Cletus, H. E., Mahmood, N. A., Umar, A., and Ibrahim, A. D. (2018). Prospects and challenges of workplace diversity in modern day organizations: a critical review. *Holistica J. Bus. Public Admin.* 9, 35–52. doi: 10.2478/hjbpa-2018-0011
- Coffin, M. (2015). *National Marine Science Plan 2015–2025: Driving the Development of Australia's Blue Economy*. Available online at: <https://www.marinescience.net.au/wp-content/uploads/2018/06/National-Marine-Science-Plan.pdf> (accessed November 25, 2022).
- De Santo, E. M., and Yaffee, S. L. (2021). *Beyond Polarization: Public Process and the Unlikely Story of California's Marine Protected Areas*, Vol. 35. Washington, DC: Island Press. p. 734–737. doi: 10.1163/22116001-03501039
- Dixon-Fyle, S., Dolan, K., Hunt, V., and Prince, S. (2020). *Diversity Wins: How Inclusion Matters*. Available online at: <https://www.mckinsey.com/featured-insights/diversity-and-inclusion/diversity-wins-how-inclusion-matters> (accessed October 15, 2022).
- Farmery, A. K., Allison, E. H., Andrew, N. L., Troell, M., Voyer, M., Campbell, B., et al. (2020). Blind spots in visions of a "Blue Economy" could undermine the ocean's contribution to eliminating hunger and malnutrition. *One Earth* 4, 28–38. doi: 10.1016/j.oneear.2020.12.002
- Fisheries Act (1868). *West Coast Environmental Law*. Available online at: <https://www.wcel.org/program/canadas-environmental-reviews/fisheries-act> (accessed December 4, 2022).
- Fisheries and Oceans Canada (2022). *Engaging on Canada's Blue Economy Strategy: What We Heard*. Available online at: <https://www.dfo-mpo.gc.ca/about-notre-sujet/blue-economy-economie-bleue/engagement-paper-document-mobilisation/heard-entendu-eng.html> (accessed November 10, 2022).
- Folke, C., Österblom, H., Jouffray, J. B., Lambin, E. F., Adger, W. N., Scheffer, M., et al. (2019). Transnational corporations and the challenge of biosphere stewardship. *Nat. Ecol. Evol.* 3, 1396–1403. doi: 10.1038/s41559-019-0978-z
- Genovese, A., Acquaye, A. A., Figueroa, A., and Koh, S. L. (2017). Sustainable supply chain management and the transition towards a circular economy: evidence and some applications. *Omega* 66, 344–357. doi: 10.1016/j.omega.2015.05.015
- Gereffi, G. (2014). Global value chains in a post-washington consensus world. *Rev. Int. Polit. Econ.* 21, 9–37. doi: 10.1080/09692290.2012.756414
- Gupta, J., and Vegelin, C. (2016). Sustainable development goals and inclusive development. *Int. Environ. Agreements Polit. Law Econ.* 16, 433–448. doi: 10.1007/s10784-016-9323-z
- Harper, S., Adshade, M., Lam, V. W. Y., Pauly, D., and Sumaila, U. R. (2020). Valuing invisible catches: estimating the global contribution by women to small-scale marine capture fisheries production. *PLoS ONE* 15, e0228912. doi: 10.1371/journal.pone.0228912
- Harper, S., Salomon, A. K., Newell, D., Waterfall, P. H., Brown, K., Harris, L. M., et al. (2018). Indigenous women respond to fisheries conflict and catalyze change in governance on Canada's Pacific Coast. *Marit. Stud.* 7, 189–198. doi: 10.1007/s40152-018-0101-0
- Hicks, C. C., Cohen, P. J., Graham, N. A., Nash, K. L., Allison, E. H., D'Lima, C., et al. (2019). Harnessing global fisheries to tackle micronutrient deficiencies. *Nature* 574, 95–98. doi: 10.1038/s41586-019-1592-6
- Hicks, C. C., Gephart, J. A., Koehn, J. Z., Nakayama, S., Payne, H. J., Allison, E. H., et al. (2022). Rights and representation support justice across aquatic food systems. *Nat. Food* 3, 851–861. doi: 10.1038/s43016-022-00618-4
- ILO and International Institute for Labour Studies (2012). *Working Towards Sustainable Development: Opportunities for Decent Work and Social Inclusion in a Green Economy*. Geneva: ILO. Available online at: https://www.ilo.org/global/publications/books/WCMS_181790/lang-en/index.htm (accessed November 20, 2022).
- IOC-UNESCO (2021). *Ocean Knowledge for a Sustainable Ocean Economy: Synergies between the Ocean Decade and the Outcomes of the Ocean Panel, The Ocean Decade Series, Vol 17*. Paris: UNESCO.
- Issifu, I., Deffor, E. W., Deysappriya, N. P. R., Dahmouni, I., and Sumaila, U. R. (2022). Drivers of seafood consumption at different geographical scales. *J. Sustain. Res.* 4, 2–22. doi: 10.20900/jsr20220012
- Jouffray, J., Blasiak, R., Norström, A. V., Österblom, H., and Nyström, M. (2020). The blue acceleration: the trajectory of human expansion into the ocean. *One Earth* 2, 43–54. doi: 10.1016/j.oneear.2019.12.016
- KPMG (2021). *You Can't go Green Without Blue: The Blue Economy is Critical to all Companies ESG Ambitions*. Available online at: <https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/05/you-cant-go-green-without-the-blue.pdf> (accessed November 21, 2022).
- Lee, K. H., Noh, J., and Kim, J. S. (2020). The Blue Economy and the United Nations' sustainable development goals: challenges and opportunities. *Environ. Int.* 137, 105528. doi: 10.1016/j.envint.2020.105528
- Louey, P. (2022). The Pacific Blue Economy: an instrument of political manoeuvre. *Mar. Policy* 135, 104880. doi: 10.1016/j.marpol.2021.104880
- Martínez-Vázquez, R. M., Milán-García, J., and Pablo Valenciano, J. (2021). Challenges of the Blue Economy: evidence and research trends. *Environ. Sci. Europe* 33, 61. doi: 10.1186/s12302-021-00502-1
- Michalena, E., Straza, T. R., Singh, P., Morris, C. W., and Hills, J. M. (2020). Promoting sustainable and inclusive oceans management in Pacific islands through women and science. *Mar. Pollut. Bull.* 150, 110711. doi: 10.1016/j.marpolbul.2019.110711
- Michel, J. A. (2017). Rethinking the oceans: towards the Blue Economy. *Marit. Aff.* 12, 115–117. doi: 10.1080/09733159.2016.1239365
- Naylor, R., Kishore, A., Sumaila, U. R., Issifu, I., Hunter, B. P., Belton, B., et al. (2021). Blue food demand across geographic and temporal scales. *Nat. Commun.* 12, 1–14. doi: 10.1038/s41467-021-25516-4
- OECD (2016). *The Ocean Economy in 2030*. Paris: OECD Publishing. Available online at: <https://geoblueplanet.org/wp-content/uploads/2016/05/OECD-ocean-economy.pdf> (accessed November 22, 2022).
- Österblom, H., Wabnitz, C. C., Tladi, D., Allison, E., Arnaud-Haond, S., Bebbington, J., et al. (2020). *Towards Ocean Equity*. Washington, DC: World Resources Institute.
- Pauly, D., Christensen, V., Guenette, S., Pitcher, T. J., Sumaila, U. R., Walters, C. J., et al. (2002). Towards sustainability in world fisheries. *Nature* 418, 689–695. doi: 10.1038/nature01017
- Sala, E., Mayorga, J., Costello, C., Kroodsma, D., Palomares, M. L. D., Pauly, D., et al. (2018). The economics of fishing the high seas. *Sci. Adv.* 4, eaat2504. doi: 10.1126/sciadv.aat2504

- Schubauer, A., and Sumaila, U. R. (2016). Economic viability and small-scale fisheries—a review. *Ecol. Econ.* 124, 69–75. doi: 10.1016/j.ecolecon.2016.01.018
- SDG Knowledge Platform (2014). *Blue Economy Summit*. Available online at: <https://sustainabledevelopment.un.org/?page=view&nr=603&type=13&menu=1634> (accessed October 18, 2022).
- Selig, E. R., Hole, D. G., Allison, E. H., Arkema, K. K., McKinnon, M. C., Chu, J., et al. (2019). Mapping global human dependence on marine ecosystems. *Conserv. Lett.* 12, 1–10. doi: 10.1111/conl.12617
- Silver, J. J., Gray, N. J., Campbell, L. M., Fairbanks, L. W., and Gruby, R. L. (2015). Blue Economy and competing discourses in international oceans governance. *J. Environ. Dev.* 24, 135–160. doi: 10.1177/1070496515580797
- Singh, G. G., Cisneros-Montemayor, A. M., Swartz, W., Cheung, W., Guy, J. A., Kenny, T. A., et al. (2018). Rapid assessment of co-benefits and trade-offs among sustainable development goals. *Mar. Policy* 93, 223–231. doi: 10.1016/j.marpol.2017.05.030
- Singleton, R. L., Allison, E. H., Gough, C., Kamat, V., LeBillon, P., Robson, L., et al. (2019). Conservation, contraception and controversy: supporting human rights to enable sustainable fisheries in Madagascar. *Glob. Environ. Change* 59, 101946. doi: 10.1016/j.gloenvcha.2019.101946
- Srinivasan, U. T., Cheung, W. W., Watson, R., and Sumaila, U. R. (2010). Food security implications of global marine catch losses due to overfishing. *J. Bioecon.* 12, 183–200. doi: 10.1007/s10818-010-9090-9
- Stackelberg, K. V., Li, M., and Sunderland, E. (2017). Results of a national survey of high-frequency fish consumers in the United States. *Environ. Res.* 158, 126–136. doi: 10.1016/j.envres.2017.05.042
- Sultana, F. (2022). The unbearable heaviness of climate coloniality. *Polit. Geogr.* 99, 102638. doi: 10.1016/j.polgeo.2022.102638
- Sumaila, U. R. (2022). *Infinity Fish: Economics and the Future of Fish and Fisheries*. Elsevier: Elsevier-Associated Press.
- Sumaila, U. R., Guénette, S., Alder, J., and Chuenpagdee, R. (2000). Addressing the ecosystem effects of fishing using marine protected areas. *ICES J. Mar. Sci.* 57, 752–760. doi: 10.1006/jmsc.2000.0732
- Sumaila, U. R., Lam, V. W., Miller, D. D., Teh, L., Watson, R. A., Zeller, D., et al. (2015). Winners and losers in a world where the high seas is closed to fishing. *Sci. Rep.* 5, 8481. doi: 10.1038/srep08481
- Sumaila, U. R., Palacios-Abrantes, J., and Cheung, W. (2020). Climate change, shifting threat points, and the management of transboundary fish stocks. *Ecol. Soc.* 25, 40. doi: 10.5751/ES-11660-250440
- Sumaila, U. R., and Tai, T. C. (2020). End overfishing and increase the resilience of the ocean to climate change. *Front. Mar. Sci.* 7, 523. doi: 10.3389/fmars.2020.00523
- Sumaila, U. R., and Vasconcello, M. (2000). Simulation of ecological and economic impacts of distant water fleets on Namibian fisheries. *Ecol. Econ.* 32, 457–464. doi: 10.1016/S0921-8009(99)00120-2
- Sumaila, U. R., Walsh, M., Hoareau, K., Cox, A., Teh, L., Abdallah, P., et al. (2021). Financing a sustainable ocean economy. *Nat. Commun.* 12, 3259. doi: 10.1038/s41467-021-23168-y
- Sumaila, U. R., and Walters, C. (2005). Intergenerational discounting: a new intuitive approach. *Ecol. Econ.* 52, 135–142. doi: 10.1016/j.ecolecon.2003.11.012
- The Economist (2015). *The Blue Economy: Growth, Opportunity and a Sustainable Ocean Economy*. Available online at: https://impact.econ-asia.com/perspectives/sites/default/files/images/Blue%20Economy_briefing%20paper_WOS2015.pdf (accessed November 5, 2022).
- The Indian Act (1876). Available online at: https://indigenousfoundations.arts.ubc.ca/the_indian_act/ (accessed December 2, 2022).
- Tickler, D., Meeuwig, J. J., Bryant, K., David, F., Forrest, J. A., Gordon, E., et al. (2018). Modern slavery and the race to fish. *Nat. Commun.* 9, 4643. doi: 10.1038/s41467-018-07118-9
- Tladi, D. (2014). *The Common Heritage of Mankind and the Proposed Treaty on Biodiversity in Areas Beyond National Jurisdiction: The Choice Between Pragmatism and Sustainability*. 25 Yearbook of International Environmental Law. Available online at: <https://ssrn.com/abstract=2655472> (accessed October 5, 2022).
- UNEP (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. Nairobi: UNEP. Available online at: <https://www.unep.org/resources/report/towards-green-economy-pathways-sustainable-development-and-poverty-eradication-10> (accessed November 9, 2022).
- United Nations (2018). *Resolution Adopted by the General Assembly on 24 December 2017. A/RES/72/249*. Available online at: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N17/468/77/PDF/N1746877.pdf?OpenElement> (accessed November 29, 2022).
- Virdin, J., Vegh, T., Jouffray, J. B., Blasiak, R., Mason, S., Österblom, H., et al. (2021). The ocean 100: transnational corporations in the ocean economy. *Sci. Adv.* 7, eabc8041. doi: 10.1126/sciadv.abc8041
- Wells, H. B., Kirobi, E. H., Chen, C. L., Winowiecki, L. A., Vågen, T. G., Ahmad, M. N., et al. (2021). Equity in ecosystem restoration. *Restorat. Ecol.* 29, e13385. doi: 10.1111/rec.13385
- World Bank (2017). *What is the Blue Economy?* Available online at: <https://www.worldbank.org/en/news/infographic/2017/06/06/blue-economy> (accessed September 24 2022).
- WWF (2012). *UK Briefings. Social Development. Fisheries Management and Gender*. Available online at: http://d2ouvy59p0dg6k.cloudfront.net/downloads/women_conservation_fisheries_2012.pdf (accessed July 14, 2022).
- WWF (2015). *Principles for a Sustainable Blue Economy*. Available online at: https://wwfint.awsassets.panda.org/downloads/15_1471_blue_economy_6_pages_final.pdf (accessed July 14, 2022).