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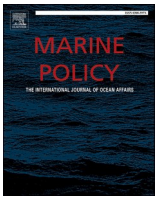



Blue growth and blue justice: Ten risks and solutions for the ocean economy

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ABSTRACT

The oceans are increasingly viewed as a new frontier for economic development. Yet, as companies and governments race to capitalize on marine resources, substantial risks can arise for people and the environment. The dominant discourse that frames blue growth as beneficial for the economy, developing nations, and coastal communities risks downplaying the uneven distribution of benefits and potential harms. Civil society organizations and academics alike have been sounding the alarm about the social justice implications of rapid and unchecked ocean development. Here, we review existing literature to highlight ten social injustices that might be produced by blue growth: 1) dispossession, displacement and ocean grabbing; 2) environmental justice concerns from pollution and waste; 3) environmental degradation and reduction of ecosystem services; 4) livelihood impacts for small-scale fishers; 5) lost access to marine resources needed for food security and well-being; 6) inequitable distribution of economic benefits; 7) social and cultural impacts; 8) marginalization of women; 9) human and Indigenous rights abuses; and, 10) exclusion from governance. Through this critical review, we aim to stimulate a rigorous dialogue on future pathways to achieve a more just and inclusive ocean economy. We contend that a commitment to 'blue justice' must be central to the blue growth agenda, which requires greater attention to addressing the 10 risks that we have highlighted, and propose practical actions to incorporate recognitional, procedural, and distributional justice into the future ocean economy. However, achieving a truly just ocean economy may require a complete transformation of the blue growth paradigm.

1. Introduction

Once vast and remote spaces, mostly traversed by commercial fishing and transport vessels, oceans are now receiving unprecedented attention from an extraordinary diversity of new actors and industries [1]. Energy prospectors, biotechnology companies, deep-sea mining enterprises, and fishing and aquaculture interests, among others, increasingly seek to claim areas of the ocean and develop marine resources [2]. Whether it be the enclosure of massive swaths of coastal mangrove forests for globalized carbon markets [3,4], the rush to develop deep-sea oil reserves [5–8] and marine renewable energy sources [9–11], or the continued push to expand fisheries into new areas [12–14], examples of ocean commodification abound. A range of terms are used, including blue economy [15,16], blue growth [17,18], or the ocean economy [19,20], to describe this renewed interest in ocean-based economic development. In this paper, we use "ocean economy" to refer broadly to all forms of economic development in the oceans and "blue growth" to denote increases in activities associated with the ocean economy. While ocean-based economic development has been ramping up for decades, the speed and scope of blue growth is accelerating - as the oceans have become part of a globalized discourse on economic growth [2].

Indeed, many national governments and corporate actors are promoting the blue growth agenda by framing the oceans as a place for good business, "ripe for development", and teeming with opportunity to stimulate economic growth [15,16,21]. The Organization for Economic Co-operation and Development, for example, suggests that ocean industries are the solution to a slowing global economy and projects that their contribution could double from US$1.5 trillion in 2010 to US$3 trillion in 2030 [19]. The European Union, which is proactively pursuing a "Blue Growth Strategy", describes oceans "as drivers for the European economy" and articulates that realizing their potential requires "enabling market forces, by removing those barriers and market failures

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that prevent innovation and investment" [17]. The potential of the ocean economy to contribute to economic development in developing nations and Small Island Developing States (SIDS) has also received significant attention from global and regional institutions [22]. It is argued that coastal populations and communities will benefit from employment opportunities, raw materials and food security, capacity building and social programs, economic revenues, and infrastructure development associated with ocean-based development [19,23–26]. There has also been recent attention to the potential of a well-designed ocean economy to contribute to the recovery of island nations and coastal communities from the economic effects of the COVID-19 pandemic [27].

However, the fervor with which future ocean development is projected to occur creates material and discursive risks. Rapid expansion of economic activities in the oceans without precaution will have profound implications for an already overburdened marine environment and resources [18,28–30]. The dominant discourse that frames blue growth as beneficial for the economy, for developing nations and for coastal communities risks downplaying the uneven distribution of benefits and the potential for substantial social harms without sufficient 'checks and balances' [16,31]. Many civil society organizations, most notably the World Forum of Fisherpeople (WFFP), International Collective in Support of Fisherworkers (ICSF) and the Transnational Institute, are pushing back against 'ocean grabbing' and 'blue justice' issues that are being perpetrated by blue growth [32–35]. Researchers around the world have also been documenting environmental and social injustices occurring as a result of past ocean-based development activities, including industrial fisheries [36–39], aquaculture [40,41], oil and gas development [6,7,42] and blue carbon markets [43,44].

This increasing attention to 'blue justice' can be seen as part of an ongoing critique of the restructuring of rules and authority over the access, use, and management of marine resources and areas of the ocean [31,45–48]. Yet, in our view, the risks of social and environmental injustices stemming from blue growth are still insufficiently recognized by those advocating for substantial increases to economic development activities in the oceans. The notion of social justice – which includes recognitional, procedural and distributive justice concerns [49] - provides useful analytical clarity for conceptualizing the means or processes through which resources and spaces are being re-allocated, and the resultant substantive ends in terms of the distribution of benefits and harms to different groups of people. To draw attention to these issues, we review existing literature with evidence of or insights into social and environmental injustices resulting from previous ocean-based economic development. Through this review, we highlight ten risks and considerations that should be taken into account in the future to guide national and international decision-making related to the ocean economy and blue growth.

2. Review: evidence of social injustices resulting from blue growth

In this section, we explore past injustices produced by ocean-based economic development through a qualitative review of the literature. The central question guiding our inquiry was "What social injustices can result from the ocean economy?" We used a qualitative or narrative review approach for this research to allow for patterns and themes to emerge from an exploration of the broader literature on a topic [50,51]. The steps we employed included: a) conducting an initial systematic search of the literature using key terms (outlined below), b) allowing themes related to the central question to emerge through open-coding of titles and abstracts, and c) supplementing the narrative review through additional searches of the literature. For the purposes of the review, we defined social injustices as the unequal distribution of benefits and/or burdens as well as unfair decision-making and governance processes [52–57]. The literature review was guided by an initial search of the literature in Web of Science and Google Scholar using the following search strings: a) "social justice", "environmental justice", "social equity", and "social impacts", b) combined with "ocean*", "marine" or "coast*", and c) "blue growth", "blue economy", "ocean development" or the names of different sectors of the ocean economy. This included, for example, fisheries, aquaculture, mariculture, tourism, mining, oil, renewable energy, desalination, blue carbon, port development and shipping sectors. This initial search of the literature turned up 312 discrete references. We reviewed the titles and abstracts of the papers for themes, using a process of emergent or open-coding [58,59], which resulted in ten main categories of injustices:

1. Dispossession, displacement and ocean grabbing;
2. Environmental justice concerns from pollution and waste;
3. Environmental degradation and reduction of availability of ecosystem services;
4. Livelihood impacts for small-scale fishers;
5. Lost access to marine resources needed for food security and well-being;
6. Inequitable distribution of economic benefits;
7. Social and cultural impacts of ocean development;
8. Marginalization of women;
9. Human and Indigenous rights abuses; and
10. Exclusion from decision-making and governance.

Once we had developed a comprehensive set of themes representing the potential injustices of ocean-based development, we supplemented our review with literature drawn from our own expert knowledge of these issues and additional searches of the literature for empirical examples that covered specific themes and sectors. Below, we discuss evidence pertaining to the ten categories of injustices that were identified from the literature review.

2.1. Dispossession, displacement and ocean grabbing

The recent acceleration of blue growth agendas has prompted critiques about the associated risks of "ocean grabbing" and "coastal grabbing" [34,45,46,60]. Indeed, ocean-based development has long been seen as a potential driver of dispossession of resources from local users through privatization and other means of accumulation. For example, the extensive past and continuing commodification and privatization of fisheries resources, notably through (re)allocation of fisheries rights and market-based regimes, has led to corporate concentration and loss of resource access for local users in Canada, the U.S., Iceland and elsewhere [61–66]. Global demand for seafood has also increased foreign distant water fleets leading to the diversion and appropriation of fisheries resources, both via legal agreements and illegal means, away from coastal communities and small-scale fishers throughout Africa and other areas of the world [67–69]. Though fisheries has received the most attention in the academic literature, the grabbing or appropriation of benefits from other marine resources – e.g., mangroves [43] and genetic resources [70] – away from local people is also a concern.

Spatial displacement of local resource users, small-scale fishers and Indigenous Peoples is also evident across a number of sectors, including aquaculture [45,71,72], oil and gas development [8,73,74], seawater desalination plants [75], and tourism [76]. These spatial enclosures were already occurring prior to the implementation of the United Nations Convention on the Law of the Sea (UNCLOS), which established exclusive economic zones (EEZ) in the 200 nautical mile maritime area bordering nations providing clear authority and a mechanism through which states could allocate use and property rights in the ocean [77]. This likely sped up the process of enclosing areas for development – with some viewing marine spatial planning (MSP) as a tool that facilitates spatial enclosures for the purposes of blue growth [78,79]. Within this enabling policy environment and an increasingly busy ocean, a major concern for many coastal communities has been the creeping and

cumulative enclosures resulting from multiple development activities rather than a single sector or development project [80,81]. Finally, displacements as a result of ocean development can extend into the foreshore and coastal environments that people use for resource harvesting or where coastal communities are located due to onshore processing plants and transportation infrastructure [75,82,83].

2.2. Environmental justice concerns from pollution and waste

Economic development activities can produce numerous toxic pollutants, and other forms of waste, that are harmful to both the marine environment and people. Environmental injustices resulting from the impacts of these harmful substances on human populations and health are often disproportionately borne by specific groups (e.g., marginalized racial groups, women, Indigenous Peoples, small-scale fishers) and in particular regions of the world [53,84,85]. Research on environmental injustices caused by the oil industry have received substantial attention – demonstrating, for example, how oil development activities and spills have led to substantial physical and mental health impacts for local communities, resource-dependent fishers and Indigenous groups [6,86–90]. The potential impacts are long-term as the physical infrastructure, including pipelines and rigs, left behind by the oil industry may continue to release toxins for years [6]. Similarly, research on desalination frequently shows how air pollution and chemicals used (e.g. arsenic, cadmium, cyanide and chloride) are disrupting the livelihood of low-income coastal communities [91,92]. Many other local development activities – including tourism [93,94], aquaculture [40,41,95], nuclear energy [96], and port development [97,98] – can also have environmental justice implications. These examples illustrate how pollution and waste from ocean-based economic development can produce substantial impacts on water, sediment, air, and food sources with implications for human health and wellbeing.

Many of the pollution and environmental justice implications of blue growth are more global in nature. Demaria [99] and Frey [100], for example, show how environmental hazards and harms produced by the global shipping industry are distributed offshore to peripheral regions. At Alang-Sosiya in India, which is one of the world's largest ship-breaking yards, ship owners and ship breakers earn substantial profits by offloading toxic waste onto local shipyard workers, fishers and farmers [99]. Furthermore, the negative impacts stemming from the production and dumping of other environmental hazards – e.g., carbon or heavy metals, such as mercury and lead – may circulate globally and disproportionately impact resource-dependent groups and marginalized populations in developing countries. For instance, oceanic mercury accumulates in fish that are vital to the food security and cultural continuity of coastal Indigenous communities [101] who are 15 times more dependent on fish for food than non-Indigenous communities [102]. The rapid global development of the cruise industry has also raised social and environmental justice concerns [103]. A recent study highlighted increased stress levels in communities that host large cruise ships [104], while Pallis et al. [105] document irregular charging practices for waste disposal at European ports, which creates challenges and potentially incentivizes unsustainable waste management. In the now infamous case, Carnival Cruise Line was fined $40 million USD for illegal dumping of oil byproducts at sea [106]. Three years later, Carnival pleaded guilty to six probation violations, including the dumping of plastic mixed with food waste in Bahamian waters and was fined $20 million USD [107]. Evidence of the social and environmental damages associated with the largely ungoverned global cruise industry continues to mount.

2.3. Environmental degradation and reduction of ecosystem services

Coastal communities and resource-dependent populations are reliant on marine ecosystem services [108]. Essential marine ecosystem services include provisioning ecosystem services such as food, water, wood and other materials, regulating services such as flood protection, erosion control or hazard mitigation, supporting services such as providing nurseries and wildlife refugia, nutrient cycling or primary production, and cultural services such as heritage, recreational and educational values [108–110]. Environmental degradation resulting from various forms of ocean and coastal development can undermine the abundance and the quality of ecosystem services. For example, shrimp farming in Latin America and Southeast Asia has led to the destruction of vast areas of mangrove forests that previously provided food and material needs, as well as protection from flooding and natural hazards, to local populations [41,45,111,112]. Sand mining – a growing industry in many parts of the global south – can degrade estuaries, water quality, and marine habitats with resultant impacts on coastal fish populations [113]. Globally, overfishing, destructive fishing, and foreign fleets have also led to productivity declines that are undermining local catches for subsistence needs and food security [67,69,114]. The appetite for fishmeal required for commercial aquaculture production has worsened these problems – for example, in Thailand and Africa - through employing fishing practices that target smaller pelagic and juvenile fish undermining the ecosystem and abundance [112,115]. Furthermore, the ocean is subject to multiple forms of development simultaneously that have cumulative effects on the marine environment and coastal ecosystem services [116,117].

2.4. Livelihood impacts for small-scale fishers

Ocean-based growth can also negatively impact or even lead to the exclusion of the livelihoods of small-scale fishers [31,118]. Evidence from the Philippines demonstrates that small-scale fishers' livelihoods can be compromised by the government's push to develop the coastal tourism industry [119]. In an extreme example, a fishers' boat was confiscated by the foreign owner of a resort and fishers reported that the local government was afraid to confront the resort owner on their behalf because of the influence he exerted over tourism revenues [119]. Both non-renewable and renewable energy developments can also present significant challenges for SSF livelihoods. In Ghana, for instance, small-scale fishers have been excluded from fishing within 1000 m of foreign oil rigs and experienced physical violence by members of the Fisheries Enforcement Units [120]. In the US, the development of marine renewable energy has been rife with space-use conflicts between small-scale fishers and state and federal agencies, where fishers hold a relatively weak position in the negotiations over spatial zoning that directly impacts their livelihoods [11].

Within the fishery sector, a focus on privatization, capitalization, and profits has led to increased industrialization of fisheries, concentration of quota and vessel ownership and corporate capture of revenues, including by multinational or foreign owned companies [61,121,122]. Privatization of catch shares have been shown to undermine the livelihoods of small-scale fishers [123]. In the ocean quahog and surf clam fishery of the eastern US, the adoption of individual transferable quotas (ITQs) led to a reduction in vessels numbers, as owners decided to lease out their quotas, which ultimately resulted in the loss of employment for local fishers [124]. Moreover, these examples highlight some of the risks associated with growth-based policies that privilege large-scale enterprises and net economic growth over the rights and livelihoods of local small-scale fishers.

2.5. Lost access to marine resources required for food security and well-being

As the push to further develop the ocean economy increases, so do the empirical examples of how this growth can undermine the ability of coastal communities to access and derive benefits from marine resources required to secure food security and well-being. Empirical examples show that this can occur in three ways: 1) through undermining formal access and harvesting rights, 2) through increased competition over resources or areas of the ocean, and 3) through influencing people's

capacity to access resources.

First, blue growth initiatives can erode formal access and harvesting rights of local individuals and groups. For example, Kerr et al. [125] highlight the lack of attention to and potential risk of loss of marine access rights of Indigenous and local communities through the enclosure of large areas of the ocean for marine renewable energy projects in Scotland, Canada, New Zealand and Australia. Similarly, Blythe et al. [126] documented how a foreign owned export-oriented shrimp farm leased public land in central Mozambique and, thus, formally blocked access to tidal flats that local communities relied on for making salt. Through a case study in Papua New Guinea, Lau et al. [127] document how the shift to a cash economy has changed the legitimacy of customary institutions – and the access to marine resources that they entail – in ways the benefit some individuals and groups (young men) and exclude others (women). These examples illustrate how blue growth initiatives are changing which groups and individuals have recognized rights to access marine resources.

Second, many threats to access stem from increased competition over resources or spatial conflicts among the ever-growing stakeholder groups vying for ocean resources. Competition between extractive industries, such as offshore oil, and fisheries have been well documented [8,128,129]. Offshore oil also competes with tourism for coastal environments [130]. The rapid expansion of renewable energy projects has increased spatial competition in coastal and open oceans areas - for example, Yates et al. [131] show significant trade-offs between renewable energy and fisheries activities. Offshore wind has also created conflicts with coastal tourism operations [132]. In Germany and Scotland, opponents of offshore wind energy projects argue that they disrupt visual aesthetics, local character and identities, degrade the experience of coastal tourists, interfere with recreational activities, and increase environmental impacts [132].

Third, barriers to access extend beyond spatial or physical barriers to include institutional, regulatory, financial, capacity, and social barriers among others [133]. The liberalization, privatization and corporatization of fisheries, for instance, has often led to rising costs for fishing licenses and quota, which in Canada and elsewhere prevents many younger fishers from entering the fishing industry [134,135].

2.6. Inequitable distribution of economic benefits

Potential economic benefits are an oft-used rationale for blue growth – these developments are needed, it is argued, because they will produce jobs, increase local incomes, contribute to local and national economies, and provide rents and taxes to national coffers [17,22]. Yet, there may be significant gaps between rhetoric and reality: the distribution of the economic benefits of marine resource harvesting and ocean-based development is often highly inequitable [136]. As the examples below demonstrate local communities are often left out of the economic benefits and few local jobs may materialize [137]. Oil development, which often produces substantial economic benefits, is one example where both hiring and the procurement of goods and services may not flow through nearby coastal communities or cities [73,138,139]. While there may be other opportunities in local service jobs, many local people in "oil cities" may be worse off economically due to rising costs of living [139,140]. Resource-based livelihoods – e.g., fishers and farmers – can experience substantial impacts [140,141]. Globalization and market integration may also be an issue – in Mexico, Cruz-Torres [142] argue, economic benefits are being undermined by environmental degradation driven by intensified and export-oriented commercial fishing and aquaculture. Furthermore, vulnerable and marginalized groups – e.g., women, Indigenous Peoples, small-scale fishers, and low-income populations – may also receive less of the benefits. For example, aquaculture development in mangrove areas around the world has often led to "elite capture" of the benefits by a select few while traditional resource users and small-scale fishers often lose out and few jobs are held in local communities [41,143–146]. This is due to a number of factors that are unfavorable to the rural poor, such as high rents, privatization and land prices, unfavorable policies for concessions and subsidies, and lack of access to technology, technical assistance and markets.

One reason that economic benefits are inequitably distributed is because ownership and control of resources is already centralized and increasingly uneven. For example, more than 47% of patents for marine genetic resources are registered to a single corporation and 98% are registered to actors from 10 countries [70]. Similarly, wealthy countries dominate global fishing efforts both on the high seas (98%) and in the exclusive economic zones of low income countries (78%) [147]. In many coastal fisheries, there has also been an increasing concentration of fishing licenses and quota with fewer individuals and corporations, which has reduced economic benefits to small-scale independent fishers and coastal communities [61,65,121]. Many new forms of blue economy development – such as aquaculture and tourism – may show similar patterns of concentrated ownership and benefits. The above examples further demonstrate the dangers of aggregate thinking – i.e., net economic benefits – and how blue growth might instead lead to local marginalization [148] and "unjust uneconomic growth" that does not account for social and environmental externalities [149]. The latter argument is made by Nogué-Algueró [149] with reference to port development in Barcelona. When the primary responsibility of corporations is to their investors not to local people and communities, without government oversight and mechanisms requiring local hiring or benefit sharing, corporations may feel that they have little reason to share profits.

2.7. Social and cultural impacts of ocean development

As coastal areas shift towards a 'blue economy', often through external investments and interests, local people are experiencing profound social and cultural changes. In many cultures, coastal areas and the sea have deep social and cultural significance [150–152]. Particular places and species hold cultural values and meanings that have been reinforced over time through historical use and shared practices [152]. For this reason, people in many traditional cultures and societies come to see themselves as interconnected with the ocean [151]. In these communities, fishing livelihoods and subsistence harvesting represent more than a source of income or food; they are also the basis for their social and cultural identity [153]. However, under a model of blue growth that prioritizes economic development, uses and values that can be monetized tend to be privileged over social and cultural values that cannot. As a result, the consideration of social and cultural impacts from coastal and ocean development also tend to be ignored. Yet access to traditional grounds and resources, traditional practices, and fishing livelihoods can be severely disrupted by blue growth, leading to a re-definition of relationships with the ocean that are fundamental to cultural identity and continuity [31,60,154]. For example, blue carbon initiatives have struggled to integrate local knowledge, traditional customs, livelihoods, and rights, in island states of the Indo-Pacific region [154,155]. What begins as a more subtle form of cultural erasure, can lead to even more egregious actions that displace livelihoods and communities. For example, in Tanzania and elsewhere, restrictions and closures first motivated by marine conservation have enabled capital accumulation by coastal tourism interests in ways that have excluded local people from livelihood opportunities and dispossessed coastal lands and areas of the ocean [76].

Social relations and cohesion can also be disrupted by blue growth. For example, in the Pacific where subsistence fisheries are fundamental to social relations, the development of export-orientated tuna industries from the 1970s across the Pacific has transformed community life in many ways [156]. Social tensions erupted following labour migration to fill workforce demands, due to ethnic mixing and issues around housing capacity, in PNG and the Solomon Islands [156]. Historically dispossessed local groups in Madang, PNG asked to be compensated by the tuna company who now occupied their land and were privileging other

Papua New Guineans for employment opportunities [157]. Other island states – including the Dominican Republic and Indonesia - also embarked on neoliberal policies in the 1970s that led to the development of large-scale mass tourism with wide ranging social impacts including lost access to resources, resident displacement, loss of agency, and declining social cohesion [158,159].

2.8. Marginalization of women

Women play significant but often "invisible" roles in the coastal economy. Their contributions, for instance in fisheries where nearly half of the workforce is estimated to be female, are often unrecognized, unpaid or underpaid [160–162]. Yet, broader "structures of discrimination" (economic, social, political) continue to produce and reproduce inequalities that lead to women's marginalization in fisheries [163,164] and other sectors (e.g. tourism, aquaculture, oil & gas, blue carbon) of the ocean economy [43,165–167]. When existing gender inequalities are ignored, they risk being exacerbated by blue growth. For instance, women are often primarily responsible for household management and childcare, and women's contributions are often to labor-intensive yet lower-paid "supporting activities" such as fish processing [168,169].

Furthermore opportunities to improve gender equality often remain limited, as fisheries and aquaculture livelihood programs are often targeted at an assumed male 'breadwinner' [170,171], and new and higher earning jobs created in the ocean economy are often for roles that are traditionally held by men [172,173]. With better access to capital, the required skills and education and the capacity to migrate for work, men are also better positioned to take up new opportunities [174]. In Kenya, access to finance was found to be a key constraint in women's participation in coastal tourism where a majority of SMEs are owned by men [175]. Gendered pay discrimination is also pervasive with women receiving the lower wages and less for their contributions in the blue carbon credit market compared to men [176]. Additionally, when new sectors lead to male labour migration, women are left with reduced means of supplementing their household income. Without this, their level of agency and bargaining power within the household diminishes, making them more vulnerable to marginalization, exploitation and abuse [79,177].

Lack of inclusion during the planning stages can sideline women and further entrench gender differences in employment and economic benefits [172,173]. In Indonesia, for instance, women were excluded from the planning stages of a growing marine tourism sector [178]. Furthermore, women's exclusion from consultation, decision-making or mapping processes puts them at risk of losing access to the resources they depend on [79]. This is problematic as resource use and access are highly gendered and shaped by access to capital, assets, knowledge and relationships across the life course [179]. Around the world, women rely on inshore areas to harvest shellfish for income and subsistence or depend on fishers to supply them with fish for processing [168]. For instance, female shellfish harvesters have been marginalized in West Africa following blue carbon policies that ignored the role of mangroves in local women's livelihoods [43]. Similarly, expansion of oil development in Nigeria reduced women's access to unpolluted farmlands and fishing areas [167]. Whereas men are offered compensations for the loss of their fishing grounds, women lose out if their livelihood depends on more informal tenure which fails to be recognized by formal institutions [79].

2.9. Human and Indigenous rights abuses

Opening the seas to economic development can undermine the rights of small-scale fishers and Indigenous Peoples, who have specific rights related to their historical use, tenure, and cultural reliance on specific areas or resources [180,181]. The right to fish, linked to Indigenous Peoples' subsistence and food security, is also closely tied to human rights [182,183]. The common starting place is a framing of the ocean as '*mare nullius*' (Latin expression meaning nobody's ocean) – vacant of pre-existing users and Indigenous tenure [184] – which negates the need to consider rights to participate in decisions and other fundamental rights (e.g., to food, to health, to a livelihood). For example, the marginalization of Indigenous Peoples from management systems is also often tied with ignorance of tenure, resource rights and privatization of fisheries access; examples are found in Alaska, Hawaii, Australia and Canada [184–186]. Tensions over Indigenous Peoples' rights are problematic not only because of their relationship with political status within the nation-state, but also because of their influence on negotiations and opportunities to improve employment, income and social conditions [183,187]. In locations where marine renewable energy has put pressure on Indigenous Peoples tenure and rights, this has reignited tensions and sometimes led to productive debates about marine governance, access and control of marine resources [125]. Potential enclosures of coastal sea areas can also limit rights to fishing and navigation for Indigenous Peoples and small-scale fishers. Examples include aquaculture for First Nations in Canada [40] and sea water desalination in Chile [188].

In extreme cases, unregulated ocean development can also lead to human rights abuses against workers through exploitation, mistreatment and enslavement. Exploitative labour practices (e.g. safety, overwork, non-payment of wages, forced eviction, child labour and gender violence) and human trafficking (e.g. physical abuse, confinement and murder) are documented in several countries. Global analyses are identifying labour abuses in the fishing industry and on fishing vessels [37,189]. Documented examples of human trafficking abound, such as those described by Ian Urbina in Outlaw Ocean [106] or by Derks [190] on the experiences of Cambodian migrants working on Thai fishing vessels. Yet, as Stringer et al. [191] show, human rights abuses are not restricted to illegal, unregulated and unreported fishing vessels and industrial fisheries. For example, in New Zealand's fisheries management system, despite being recognized internationally as world leading, exploitation of migrant fishing crews (primarily Indonesian) was found on foreign charter vessels [192]. What these critical studies highlight above all is that 'modern slavery' is facilitated by jurisdictional complexities and the pursuit of economic efficiency e.g. higher levels of subsidies, economic disparity in labor markets, and an interest in maximizing economic returns [189,192].

2.10. Exclusion from decision-making and governance

A final risk of ocean-based economic development, and one that likely precedes or exacerbates the previously discussed injustices, is exclusion from decision-making and governance processes. Governance refers to the policies, institutions and processes that determine who makes decisions, how decisions are made, and what impact this has on actions taken [193,194]. Externally driven and top-down decision-making and agenda-setting related to the ocean development might, for example, result in: the de-peopling and de-politicization of the seascape and coastal landscape, homogenizing narratives that ignore local social and cultural contexts, and ignorance of the actual and inequitable economic impacts of blue growth [40,80,195–197]. Perhaps it is more convenient, where development is concerned, to portray the oceans as unused, underdeveloped, and unpeopled. Lack of adequate participation or consideration of local people's voices and perspectives are common across different sectors of the ocean economy – including aquaculture [40,80,198], tourism [197], oil and gas development [199], marine renewable energy development [200], sea water desalination [75,91] and mining [201]. Key issues have included lack of inclusion of key stakeholders, choreographed participation processes where decisions have been pre-determined, lack of advance communication about meetings, as well as inadequate transparency and information about both the benefits and negative consequences. In the above examples, these factors also led to dissatisfaction with the process and perceived or real negative social impacts. Marine spatial planning, as a mechanism that facilitates blue growth [78], is one arena where the rhetoric of

participation is high. Yet, a number of authors have critiqued marine spatial planning process for not including all stakeholders from early stages to shape the process, tokenistic participation processes, poor communication, dismissal of experiential knowledge of local resource users, inadequate specificity regarding social impacts and benefits, and inability to incorporate feedback or change directions due to path dependency [196,202–205]. At a much higher scale, Sparks and Silva [206] show that low income states are less represented and have less influence in international marine policy processes such as the UN Negotiations for the High Seas which may lead to inequitable benefits for them and disproportionate impacts on their human security.

3. Discussion: transforming the ocean economy to achieve blue justice

In this paper, we have identified and reviewed the literature on 10 injustices that can result from ocean-based economic development. Our review purposefully focuses on highlighting negative examples and past injustices. Yet we recognize that there is also positive potential in blue growth for coastal communities and nations [22,24,207]. For many nations, blue growth holds the potential for shared prosperity, food security, local employment, capacity building, gender equality, and economic benefits [24,25,208]. In practice, most development activities will likely produce a complex combination of negative and positive social impacts for different groups of society. Ultimately, our aim in writing this critique is to promote a rigorous dialogue about not only avoiding worst-case scenarios and mitigating harms but also maximizing benefits from the ocean economy. One way to develop lessons for the future is to be cognizant of past issues. Thus, this explicit critique of injustices articulates past harms in order to inform and improve future development. It is only through recognizing and addressing past social injustices related to the ocean economy directly that we can hope to achieve the UN Sustainable Development Goals' pledge to "Leave No One Behind" [209]. Consequently, in this discussion, we now turn our attention to the question "What solutions are available to achieve a more just ocean economy?".

An obvious starting place is to offer the opposite of the 10 social injustices that we have identified in the paper as a set of considerations and recommendations for avoiding injustices and promoting more just outcomes during blue growth. Following this logic, our review suggests 10 key considerations requiring attention to advance blue justice during blue growth (Fig. 1) as well as the subsequent and corresponding recommendations:

1. Recognize and protect resource and spatial tenure and access rights;
2. Take a precautionary approach to reduce pollution and ensure that environmental burdens are not placed on marginalized populations;
3. Minimize the impacts of development on habitats, resources, and ecosystem services;
4. Consider and safeguard the access rights and livelihoods of small-scale fishers;
5. Maintain and promote access to marine resources needed for food security and well-being;
6. Develop policies and mechanisms to foster and ensure the equitable distribution of economic benefits;
7. Monitor, mitigate and manage the social and cultural impacts of ocean development;
8. Recognize, include and promote the equal role of women in the ocean economy;
9. Recognize and protect human and Indigenous rights; and,
10. Develop inclusive and participatory planning and governance processes for ocean development.

These recommendations are supported by existing international



Fig. 1. Ten key considerations to advance blue justice in blue growth initiatives.

declarations and voluntary agreements – such as the Universal Declaration on Human Rights, United Nations Declaration on Indigenous Rights, the Voluntary Guidelines for Small-Scale Fisheries among others [180,181,210–212] - and codified in corporate social responsibility (CSR) principles [213–215].

Most of these high-level agreements and policy documents, however, do not specifically focus on the oceans. Furthermore, there has been insufficient attention to norms of inclusiveness and equity in past policy deliberations, documents and guidance related to the ocean economy [16,136,137]. The current focus on how to advance a "blue economy" – which is a term that Small Island Developing States (SIDS) initially put forward as a more sustainable and equitable form of development – provides an opportunity to draw attention to these issues at a scale that was not previously possible [16,136]. Furthermore, the recently released call to action of the High Level Panel for a Sustainable Ocean Economy titled *Transformations for a Sustainable Ocean Economy: A Vision for Protection, Production and Prosperity* brings to the forefront the concept of "Ocean Equity" and makes recommendations for how to achieve equitable access to ocean resources, fair distribution of benefits, and protection of the most vulnerable from harms [20,136]. The outputs of the High Level Panel for a Sustainable Ocean Economy, which is endorsed by 14 countries, provide an important initial step towards operationalizing equity norms and offer a roadmap for other national and international deliberations and policies focused on the ocean economy [16,136].

Here we argue that there is a need to go even further through adopting an explicit social justice - or 'blue justice' - framing in all policies and decision-making processes related to the ocean economy. The literature on social justice, environmental justice, just transitions, and just transformations defines three dimensions of justice: recognitional justice, procedural justice, and distributional justice [49,52–57, 216–220]. The three dimensions of justice can be defined as follows: "Recognitional justice refers to the acknowledgement of and respect for pre-existing governance arrangements as well as the distinct rights, worldviews, knowledge, needs, livelihoods, histories and cultures of different groups in decisions; Procedural justice refers to the level of participation and inclusiveness of decision making and the quality of governance processes; and, Distributional justice can be defined as fairness in the distribution of benefits and harms of decisions and actions to different groups." [49 p 4–5]. These dimensions of justice provide a broad overarching framework that might guide national or international policy deliberations on ocean-based development or actions to take when planning or managing specific development activities or projects (Table 1). The process to establish a new aquaculture project in a coastal area, for instance, should: a) analyze the social and economic context of all stakeholders and rights-holders in the location where development is planned; b) engage local stakeholders and rights-holders in participatory decision-making processes on how development will occur; and, c) identify mechanisms to increase local economic benefits and employment opportunities while limiting social harms [49].

Table 1
Key policy recommendations and actions for advancing social justice in the ocean economy.

Advancing Social Justice in the Ocean Economy
Recognitional Justice
• Identify and differentiate rights holders and stakeholders;
• Acknowledge pre-existing rights and tenure;
• Incorporate pre-existing practices, institutions, and knowledge systems;
• Integrate diverse worldviews, perspectives, and values.
Procedural Justice
• Facilitate inclusive, participatory, transparent, and accountable planning and management;
• Ensure that participants perceive that institutions, policies, managers and management actions are legitimate;
• Create adaptive and context-appropriate decision processes;
• Support local capacity for participation and co-management;
• Ensure stakeholders have access to justice and conflict resolution mechanisms.
Distributional Justice
• Consider equity in distribution of costs and benefits over time, space, and between groups;
• Design fair compensation and mitigation mechanisms;
• Adapt management to improve social and distributional outcomes.

Yet, transforming the ocean economy to achieve blue justice may not be a simple task and tinkering at the margins of state or corporate led economic development may be insufficient [221]. Achieving "blue justice" may require a substantial change to ocean governance, a rethinking of our fundamental assumptions regarding development, a reimagining of novel or alternative development models of development, or a paradigm shift regarding the need for growth. A transformation of ocean governance may entail a substantial change in who is involved in decision-making processes and in the way that decisions are made – for example, what if global decision-making bodies involved greater representation of and influence from small island developing states (SIDS), civil society organizations, or Indigenous Peoples [16,206]. Rethinking our fundamental assumptions regarding ocean-based development would require us to start by asking "Why are these injustices occurring?" and "Why do they persist?" – responses to these questions may yield challenging answers about unequal global power differentials and resource grabs [33,46,60], neoliberal and capitalist models of governance [47,118,222], and corporate cultures that place profits before people and planet. Imagining new or alternative models of development would require the flipping of this logic to instead place environmental sustainability (planet) and human wellbeing (people) before corporate profits – ideas such as regenerative ocean development [223–225], community-based blue economies [226,227], blue communities (e.g., aquaculture expansion that prioritizes community well-being) [228], or community supported fisheries [229,230] show some promise. However, scaling these ideas up and out may be challenging. Finally, some authors might go much further and ask whether it is wise to even consider increasing the scale and scope of economic development (local or otherwise) in the ocean, and instead argue for a "blue de-growth" paradigm [231,232]. Blue de-growth should especially be a consideration when there is evidence of drawing down of natural resources that people rely on for food security or human well-being [136].

4. Conclusion

This review paper has demonstrated how rapid and unchecked blue growth can produce numerous environmental and social injustices. Through a review and critique of past injustices, our aim is to stimulate a rigorous dialogue on how to achieve a more just and inclusive ocean economy. We conclude that a commitment to 'blue justice' needs to be at the core of the blue growth agenda, which requires greater attention to addressing the 10 issues that we have highlighted: tenure and access, environmental justice, ecosystem services, small-scale fisheries, food security, economic benefits, socio-cultural impacts, gender equity, human rights, and inclusive governance. In order to minimize social harms and maximize benefits, human well-being and environmental sustainability must be prioritized alongside economic profits. However, transforming the current blue growth paradigm to achieve 'blue justice' may require a more fundamental rethinking of assumptions regarding development, a re-imagining of alternative development models, or even a de-growth mindset. Creative thinking and bold solutions will be needed to continually envision and enact a radically different future where blue growth and ocean-based economic development does not undermine the health of the environment and (re)produce social injustices.

CRediT authorship contribution statement

Nathan J. Bennett: Conceptualization, Methodology, Investigation, Writing - original draft, Writing - review & editing; **Jessica Blythe**: Conceptualization, Investigation, Writing - original draft, Writing -

review & editing; **Carole White**: Investigation, Writing - original draft, Writing - review & editing; **Cecilia Campero**: Investigation, Writing - original draft, Writing - review & editing.

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