Indigenous Bio-cultural Conservation, and blue justice

1. Introduction

Across the world, different Indigenous nations are making great progress in taking back their ancestral rights over marine environments (Kymlicka, 2007). In some cases, this sovereignty has led to decisions to support the conservation of the marine environment through Indigenous Protected Areas (IPAs) and Locally Marine Management Areas, (LMMAs) among other mechanisms for decentralized and independent marine resource management (Anbleyth-Evans et al. in press, Luque and Doode, 2007, Von Der Porten et al. 2019, Rist et al. 2019). While many state and NGO conservation bodies have allied with and supported these Indigenous nations to realise biological conservation in the face of multiple environmental stressors [(Steffen et al. 2009), their collaboration is not always designed to support bio-cultural diversity conservation, which preserves the relationship between biological, linguistic, and cultural diversity (Maffi, 2005, Hong, 2013 and Rozzi et al. 2006, Aswani et al. 2020).

Indigenous land academic research includes research on the spatial contribution of Indigenous tenure regimes for terrestrial conservation (e.g., Garnett et al. 2018) It is also substantial in case of marine Indigenous tenure regimes (e.g., Johannes 1978; Hviding 1996). In the case of the marine environment, the complexity of different customary and legal rights of these communities are significantly different than on land, through their more fluid, less well understood benthic ecosystems, and polycentric political nature (e.g., Moreira, 2020; Aswani et al. 2017).

The article aims to show where these Indigenous rights and conservation goals are at odds with development approaches aiming to expand economic activities in marine areas, i.e. “blue growth” objectives. Through a categorisation of marine rights, the article reviews the extent blue justice is occurring, through analysis of 200 marine Indigenous nations. Blue justice, simply, is achieving environmental justice in the marine environment (Anbleyth-Evans, 2018 and Bennett et al. 2021). The concept of blue justice fits into the notion of the marine “Anthropocene” (Anbleyth-Evans, 2018 and Aswani et al. 2018) because of the

profound human impact on the environment and the concomitant asymmetry in the distribution of who bares the impact of environmentally destructive development. Given these historical impacts, blue justice aims to ensure current and future equitable processes and outcomes, but also to redress historical injustices.

While some ocean development frameworks, such as the Blue Economy approach (Cisneros-Montemayor et al. 2019 and 2021), focus on social equity and aim to strengthen local sovereignty and well-being, many ocean industries have significant externalities. For example, some of the most common projects of nations or private companies pushing for blue growth and expansionist agendas almost inevitably result in loss of space and resource access rights through ocean grabbing (Barbesgaard, 2018). Examples of such sectors considered here include: (1) submarine tailing dumping from mines (Coumans, 2018), (2) Seabed mining (Jaeckel et al. 2017), (3) port construction, dumping and dredging (Anbleyth-Evans et al. 2020), (4) land reclamation for ports (Hattam et al. 2020), (5) Oil and gas development (Hassler 2015 and Wood and Rossiter, 2017 and Andrews et al. 2021), (6) nuclear power / weapons impacts and radioactive waste (Fan, 2009), (7) military/naval base development (Lutz, 2019 and Frain, 2020), (8) sewerage (Araujo et al. 2013) (9) aquaculture (Buschmann et al. 2006), and (10) overfishing and impact on coastal ecosystems and Indigenous food security.

While Janßen et al. (2018) mention that the Marine Spatial Planning tools of the Blue Growth / Blue Economy, do not have to be negative for indigenous communities including their small-scale fisheries, in the case of marine Indigenous nations, if their rights and justice claims have already been ignored then zoning for types of projects mentioned above result in blue injustice. All these developments not only destroy Indigenous seascapes but also hamper the possibility of developing resource management and conservation initiatives building on customary systems. In this way, it aims to demonstrate the opportunities for establishing more marine bio-cultural rights and Indigenous-led governance in the future (Arlette et al. 2019).

While the UN estimates that there are about 370 million Indigenous people worldwide, which constituting less than 5% of the total population globally, this may be underestimated, as many states such as Mexico or China only record these ethnicities if they have fluency in their language rather than their own perceptions or cultural identities (Congreso nacional indigena 2020). These nations speak the majority of the world's 7000 languages, many of which are in danger of extinction through pressure from nation states (Kymlyka, 2000, Ethnologue, 2019). Of this, there are thought to be 1,900 coastal and island Indigenous communities around the world, representing at least 27 million people across 87 countries (Cisneros-Montemayor et al. 2016). Simultaneously, Indigenous people account for 15% of the world's poorest population (UN 2017).

Different marine Indigenous communities are in contestation with states facing environmental justice issues, human rights abuses and discrimination and are unable to voice their concerns and interests effectively (Kymlicka, 2007, and Stacey et al. 2017, Jentoft et al. 2019). The integration of customary management institutions, such as taboos, sacred areas, seasonal and spatial closures into marine conservation has merited much constructive attention (Aswani and Hamilton 2004), however this has not been explored in the context of supporting blue growth programmes and project decisions such as ports, aquaculture, and mining pollution. However, in the context of small-scale fisheries impact, conservation compliance has been shown to be higher in Indigenous led initiatives, than in either community or state-managed protected areas (McClanahan et al. 2006; Von Der Porten et al. 2019). Where conservation in Indigenous led areas is not functioning, it is often because of economic, social, and military disruption in the wider nation state they are incorporated into, such as Myanmar, Congo, Venezuela Honduras, and Nicaragua (Barrios Garrido et al. 2020 Gonzalez, 2017).

The paper highlights that many communities' aspirations for marine conservation are not yet legally recognised, and it critically engages with both the ecological and cultural challenges faced by people in these different areas. We conclude that marine Indigenous rights are important as they may offer an efficient response to ongoing anthropogenic impacts from port dumping, overfishing, and aquaculture contamination among other

environmentally destructive processes while realising blue justice (Anbleyth-Evans, 2018; Bennett et al. 2019). This article aims to build on this and the work of Ban et al, (2018), Von Der Porten (2019), and others on marine Indigenous conservation resurgence and leadership, to clarify the different types of marine Indigenous customary rights regimes around the world and the extent that they are recognised formally or informally. We also highlight the challenges that Indigenous peoples face to realise marine conservation and a blue justice that transcends the impacts of colonial lead injustices such as forced acculturation and territorial destitution. It is important to note that we acknowledge that Indigenous led conservation is not always successful, and that often-Indigenous conservation projects are driven by territorial claims rather than for preserving biodiversity *per se* (e.g. Polunin, 1984). Nevertheless, focusing on locally led Indigenous leadership in marine resource management and conservation has a greater chance of success than centralized top-down conservation, as showed by many case studies around the world illustrated in this paper. Also, it is a first step towards achieving more equity and blue justice amongst Indigenous nations.

2.Indigenous Marine Management Regimes: A Review

There is a vast literature describing Indigenous marine territories and associated governance systems, which often represent some of the oldest forms of marine management and conservation (e.g. habitats and species) in the world (e.g., Johannes 1978). In what follows, these are grouped according to different heuristic governance and rights structures.

1. *Small Indigenous nations that have realised independence or significant autonomy*. They can or do develop their own conservation initiatives (with or without exterior stakeholders for assistance). Examples in newly independent or autonomous nations include Fiji, Republic of Palau (amongst others in Micronesia), and Niue and The Cook Islands (amongst others in Polynesia), Bougainville and others around the Pacific. Some of these are described as having LMMAs (Govan, 2015), while others are described as having MPAs. They have the power to control all marine management initiatives.

2. *Indigenous nations that are formally or legally recognised by states as having rights, and can or do develop their own conservation initiatives for fisheries (with or without exterior stakeholders for assistance).* However, they may not be able to initiate their own marine management decisions in contradiction to the wishes of the central state. They often have associated terrestrial rights and coincide with IPAs or similar rights described as LMMAs. Examples include in the Americas: Cormaac in Mexico, (Luque and Doode 2007), the Miskito in Nicaragua (Nietschmann 1995), the Nunavat in Canada (Reed et al. 2020), Inuit groups in Greenland (Sejersen 2004), various groups in Washington State, US (e.g., Quileute Nation, 2019), Oceania: New Zealand´s Maori Maketu Taiāpure system, (Stephenson et al, 2014; Davies et al. 2018), Micronesia´s customary systems in the nations of Phonpei (Foster and Poggie, 1993) Chuuk, Yap, Kosrae and Marshall Islands (Houk et al. 2015) various aboriginal groups in Australia (e.g., Yolngu and Torre Strait Islands) (Nursery-Bray, 2011, Rist et al. 2019), Papua New Guinea (Cinner et al. 2009), Asia; various groups in the Philippines (Capistrano 2011) in Africa; groups in Madagascar (e.g. Vezo) (Andriamalala, et al. 2013) (Roecliffe et al. 2014) the Bijagos in Guinea Bissau (Madeira, 2016).

3. *Indigenous nations/communities that can or do develop marine conservation interventions for fisheries, such as based on customary systems, but legal / territorial rights for autonomy are not yet fully recognized*. However, they may not be able to initiate their own marine management decisions in contradiction to the wishes of the central state. Examples include those of Indigenous Hawaiians (Poepoe et al. 2003), various groups in Alaska (Raymond-Yakoubian et al. 2018), Inuit groups in Canada (Armitage et al. 2009) and the Heiltsuk and Haida Gwaii in Canada (Von der Porten 2019).

4. *Those without rights, who have previously had customary systems and are unable to develop marine management / marine conservation initiatives.* These include the Xhosa and Tsonga in South Africa (Sunde et al 2013), as well as many in Russia, Indonesia, Brazil, US among others. They are based on traditional forms of customary tenure / historic territory they have lost. Examples include those among many others where Indigenous

peoples would like to reclaim rights in the US such as the Wiyot, Yurok and Chetco, (Simpson, 2019). or the Sami and Nivkh in Russia (Zmyvalova, 2018).

While Indigenous Peoples' marine rights are recognised and implemented to varying degrees across different nation states, even when ignored, many Indigenous Peoples frequently maintain de facto influence over their ancestral areas (Garnett et al. 2018), such as the sea, particularly nearshore and estuarine environments. Nonetheless, economic, and or cultural globalisation, alongside dominant ethnic state cultural hegemony (through formal education, digital technologies, etc) is weakening these traditional influences and customary rights. In response, empowered coastal communities need multiple frameworks of evidence, such as combining traditional ecological knowledge and scientific research where equal power relations are necessary (Tengo et al. 2014) to further their agenda of marine sustainability and territorial autonomy. Supporting a bi-directional feedback for bio-cultural conversation is also necessary between conservation scientists, NGOs, Indigenous communities, and states to ensure progress of recognition and in some instances co-management, alongside recognition of conservation successes (Anbleyth-Evans and Lacy, 2019) and failures.

Customary systems have been recognised as Indigenous Protected Areas (IPAs) in Australia, defined as Indigenous led or driven collaborative efforts to establish marine protected areas (Rist et al. 2018) of various managerial foci and effectiveness, including spatio-temporal refugia and/or strict no take zones. While MPAs are known to be set up with the objective of preserving biodiversity and endangered habitats and species (Jones, 2014, Rees et al. 2018), customary management systems can have these objectives, whilst preserving the rights of Indigenous people. Including, to manage their own resources, carry out traditional customs, religious rituals and food security through subsistence and small-scale commercial artisanal fishing. Similarly, the emergence of LMMAs in the Pacific and Indian Oceans (Govan et al. 2009 and Roecliffe et al. 2014), offers a form of conservation zone led by coastal communities, which alongside reflecting traditional customary rights, offers a different form of community led conservation zone, with different challenges and strategies (Govan et al. 2015).

In certain places, opportunities for realising blue justice / alongside bio-cultural conservation are emerging outside state and/or NGO led marine conservation areas (Araos and Ther, 2017). In higher population coastal areas, the increasing frustration with top down centralised MPA interventions has illuminated the relative strength of local institutions in achieving conservation where local people are engaged (Christe et al. 2004 Cinner et al. 2009 and Anbleyth-Evans et al. 2019). Indeed, in many places, management failure of marine protected areas has resulted in unenforceable "paper parks" (e.g., Balmford et al. 2004, Jennings, 2009) with illegal fishing still occurring (Dureuil, 2018) and lack of enforcement (Petit et al. 2018), hence continuing problems in conventional, non-participatory, small, and medium scale MPAs have been found to be less successful (Ulate et al. 2018). Similarly, while some large scale MPA have been a success in sparsely populated parts of the Pacific (Leenhardt et al. 2013) and in the Antarctica (Liu and Brooks, 2018), the socio-political dimensions are not well integrated into the design of MPAs in populated coastal areas. Similarly, large scale MPAs may limit traditional customary management regimes, disempowering stateless nations from both their traditional cultural institutions and marine conservation (Stacey et al. 2017).

Nevertheless, it must be remembered that "one size does not fit all" when it comes to the design of marine conservation programs (Aswani et al. 2017). The next section clarifies the legal context for Indigenous customary rights.

3. Background of Legal context and marine Indigenous blue justice

In the context of blue justice, it is important to note that the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), recognises the sovereign rights of Indigenous Peoples to land, self-government, and culture (UN, 2018). However, the right to conserve the marine environment from blue growth projects through customary systems is not clearly identified. This needs to be updated, alongside the fishing rights of Indigenous people under UNCLOS III (Moreira, 2020). Worth noting in this light is the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (SSF Guidelines) (FAO 2015), which are concerned with the governance of Indigenous peoples' customary tenure systems, including

the rights to aquatic resources (Gonzalez, 2017; Jentoft et al. 2019). Furthermore, while institutes such as the IUCN are promoting the importance to marine conservation of what they call ´Other Effective Area-based Conservation Measures´ (Jonas and MacKinnon 2016), their focus still lacks a deeper consideration of the entwined importance of bio-cultural conservation. Researchers, nevertheless, are increasingly advocating adding categories recognising Indigenous interests; including participatory management, co-management, and the incorporation of Indigenous knowledge in biodiversity and protected area management (Craig et al. 2018, Maffi, 2005, Berkes, 1999).

Many endangered species and habitats exist in the areas of marine Indigenous communities. However, while customary systems may have mechanisms or cultural traditions of resource management / protection of species, these are being impacted by the expansion of the blue economy. Thus, without rights to protect bio-cultural diversity being recognised, states and corporations will continue to submerge these systems under the narrative of economic growth and national development. If biological diversity indicates ecological health and qualitative characteristics within the natural ecosystems, then the bio-cultural diversity of stateless nations has the potential to improve the resilience of social and ecological systems, alongside normal nation states (Maffi, 2005, Kong, 2013). Biocultural diversity conservation as a conceptual framework is based upon multiple disciplinary roots, with a common interest in conserving the relationship between biological, linguistic, and cultural diversity (Davidson-Hunt et al. 2012 and Cocks et al. 2012). Drawing from interest in understanding the interaction between nature and culture, it is defined by Pretty et al. (2009) as a form of co-evolution between cultural information and the social and natural environment. According to Rozzi et al. (2006) the key principles include interdisciplinary scientific / social approaches, formal and informal education through community-based conservation.

From Steward's (1955) work on cultural ecology, to Kroeber's (1939) linking between cultural and natural areas through mapping, to the identification of cultural landscapes by Sauer in (1956), the field of the conservation of natural and cultural heritage has continued to develop to encompass the notion of cultural seascapes (McNiven, 2004 and Shackeroff et

al. 2009). The introduction of the category of cultural landscape in 1993 as a type of cultural nomination for World Heritage Sites (Crumley, 1994 and Rössler, 2006), and the 1990 Rio Earth Summit led to increased discussions about the link between biological diversity and cultural diversity. Nevertheless, more attention to this needs further development in the blue economy / bio-cultural context (Narchi et al. 2015). Examples of successful efforts include: The legal recognition of the Whanganui River as Te Awa Tupua as an entity with agency (Charpleix, 2018), cultural seascapes of coral reefs in Hawaii (Shackeroff et al.2009), continued protection of sacred fishing grounds in Fiji, combined with modern measures to control overfishing in the surrounding areas (Veitayaki et al. 2016). These are promising initiatives.

2. Methods of review

The first step was to list different Indigenous nations struggling to manage their marine resources. This was supported by researching for marine Indigenous nations who had been recognised in some form, such as carrying out a flavour of marine conservation. Various lists from ICCA to UNDRIP and UNDP, to the UN special committee on decolonisation, (which supports nations on the path to independence), were searched as well as NGOs, campaign groups for Indigenous rights and other online resources. This process led to the identification of less well-known marine/coastal and estuarine Indigenous nations in the grey literature that are presented in the table below. Additionally, the online search was further extended by other scientific literature (books and peer-reviewed publications) derived from an extensive Web of Knowledge and Scopus search. For this literature search, the search terms ‘marine Indigenous’, ´marine conservation´, ´stateless nations´, environmental justice atlas, and customary rights among others were used. This led to the generation of the different categorisations of Indigenous marine areas with different rights recognitions, examining how they interacted with different blue justice issues.

3. Results

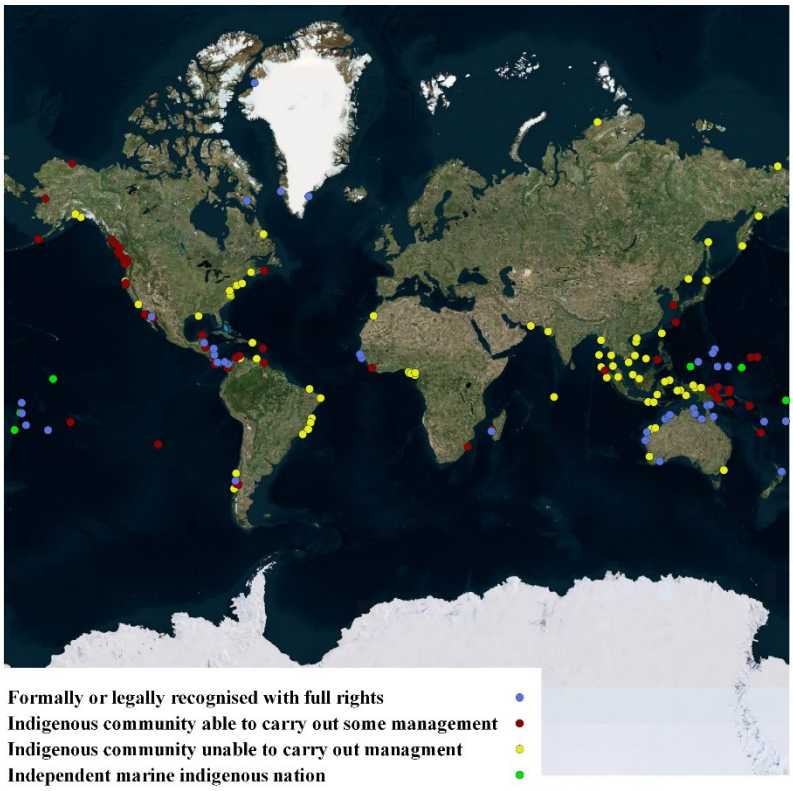

Figure 1 showing the locations of the 207 marine Indigenous communities reviewed here.

Figure 2 map showing where and what types of blue justice issues are occurring, from industrial migratory fishing in West Africa, to Submarine tailing disposal from mines in SE Asia / Oceania

Based on these review methods, information was collected on 201 marine Indigenous nations, which can be seen in Figures 1 and 2 and the excel table, (which due to its size is in the annex). This was also distilled into table 1 below for clarity. In the context of the blue justice issues the results show that: (1) small Indigenous nations that have realised independence were most successful in organising themselves against projects that threaten bio-cultural conservation. All 9 lacked marine injustice but did have some form of conservation built on and expanding traditional customary use. These clustered around the Pacific area. Category (2) Those formally or legally recognised by states as having rights, including IPAs / LMMAs had the next most success in realising marine management. Next, category (3). Marine Indigenous customary systems that lack legal recognition but can carry out management / conservation, followed by (4) those without rights recognised and any capacity for management, who experienced the most blue injustices: 82% of 92. Again, it should be reiterated that due to the focus of the study, there was selection bias towards

these types of case studies. However, it is predictable that marine Indigenous communities that have less rights experience more blue injustice with the dominance of growth planning by states around the world. A distillation of those with blue injustice issues are listed in table 1 below.

Table 1 Featuring highlighted Indigenous nations and blue justice issues.

Indigenous Group	Blue justice issue	Rights	References
Kala people Morobe province PNG	Submarine tailing mine disposal.	3	https://www.rnz.co.nz/international/pacific-news/425575/png-opposition-grows-to-dumping-mine-waste-at-sea
Muyua people in Woodlark island PNG	Submarine tailing mine disposal.	3	https://news.mongabay.com/2020/10/land-grab-logging-mining-threaten-biodiversity-haven-of-woodlark-island/
Muyuw people on Lihir island PNG	Submarine tailing mine disposal.	3	https://ejatlas.org/conflict/lihir-mine-papua-new-guinea
Mindiri people, Madang province PNG	Submarine tailing mine disposal.	3	https://www.abc.net.au/news/2019-08-30/chinese-owned-mine-in-png-spills-200000-litres-of-toxic-slurry/11464108
Sumbawa, Batau Hijau Indonesia	Submarine tailing mine disposal.	3	https://www.earthworks.org/blog/mine_waste_dumping_batu_hijau/
Minahasa people in Sulawesi (Indonesia) from the Newmont Minahasa mine, PNG	Submarine tailing mine disposal.	3	http://www.minesandcommunities.org/article.php?a=1388
Kanak people New Caledonia	Submarine tailing mine disposal.	3	(Horowitz, 2016).
Mapuche-Huichille, Chile	Aquaculture	2	Anbleyth-Evans et al.2020)
Kawashkar (Chile)	Aquaculture	3	Ongoing research
Nuu-chah-nulth, Canada	Aquaculture	3	(Heaslip, 2008).
Kwakwaka'wakw, Canada	Aquaculture	3	(Heaslip, 2008).
Wayuu (Colombia)	Oil and gas	3	(Hassler, 2015).
Warao, Venezuela	Oil and gas	4	EJAtlas
Heiltsuk, BC Canada	Oil and gas	2	Heiltsuk Oppose Oil Pipelines and Super Oil Tankers Facebook group
Nivkh people of Sakhalin island	Oil and gas	4	https://portals.iucn.org/library/sites/library/files/documents/2005-005.pdf
Ijaw people Nigeria	Oil and gas	4	https://corpwatch.org/article/nigeria-oil-spill-displaces-10-ijaw-communities

Ogoni people Nigeria	Oil and gas	4	http://www.mosop.org/
Bubi people equitorial guinea	Oil and gas	4	https://ejatlas.org/conflict/oil-extraction-on-bioko-island-equatorial-guinea
ambazonia, Cameroon	Oil and gas	4	https://www.perenco.com/subsidiaries/cameroon
Arakan, Myanmar	Oil and gas	4	http://www.shwe.org/
Eyak Alaska, US.	Oil and gas	4	http://eyakpreservationcouncil.org/about/
89. Marshall Islands	Nuclear	2	(Pevec, 2006)
Chamorro people of Guam	Nuclear	2	(Frain, 2020).
Pongso Nao Tao, Taiwan	Nuclear	3	(Fan, 2009).
Mangarevan, Mururoa and Fangataufa French Polynesia	Nuclear	3	(Keown, 2018).
Tigak people in New Ireland PNG,	Deep sea mining	3	https://www.ejatlas.org/print/deep-sea-mining-project-solwara-1-in-the-bismarck-sea-papua-new-guinea
Rarotonga, Cook Islands	Deep sea mining	2	https://news.mongabay.com/2020/06/cook-islands-to-grant-seabed-mining-exploration-licenses-within-a-year/
Mah Meri community in Malaysia	Ports, dredging, land reclaimation	4	(Hattam et al. 2020)
Makassar in Sulawesi Indonesia	Ports, dredging, land reclaimation	4	https://news.mongabay.com/2020/08/indonesian-fishers-opposed-to-dredging-project-hit-by-criminalization-bid/
The Yaburrara in Dampier	Ports, dredging, land reclaimation	2	https://sacredland.org/dampier-archipelago-australia/
Kariyarra in Port Hedland Western Australia	Ports, dredging, land reclaimation	2	https://www.epa.wa.gov.au/sites/default/files/PER_documentation/1662-PER-Appendix%20F%20-%20Mangroves%20Assessmen%20Report.pdf
Nyoongar, West Australia Sacred sites in Freemantle port	Ports, dredging, land reclaimation	3	https://www.fremantle.wa.gov.au/council/about-city-fremantle/aboriginal-history
Kutch people in Gujarat India	Ports, dredging, land reclaimation	3	(Kohli et al. 2016).
Baluch's against Gwadar port in Pakistan	Ports, dredging, land reclaimation	3	https://www.stimson.org/wp-content/files/file-attachments/baluchis-beijing-pakistan-gwadar-port.pdf
Dan, Hainan Island, China	Ports, dredging, land reclaimation	4	(Ou, and Ma, 2017)
Wampanoag, Masachusett´s US	Military base or weapons testing	4	https://www.hakaimagazine.com/news/what-to-do-with-nomans-land/

Chamorro people of Guam	Military base or weapons testing	2	(Frain, 2020).
Hawaii, US	Military base or weapons testing	3	(Poepoe et al. 2003)
Chagos Islands	Military base or weapons testing	4	https://www.chagossupport.org.uk/who-are-the-chagossians
Ryuku Onna Point, Okinawa, Japan	Military base or weapons testing	2	https://apjjf.org/-Yokemoto-Masafumi/3185/article.html
Moken, Mergui, Myanmar	Military base or weapons testing	4	http://projectmoken.com/no-word-for-worry-2/
Rohinga, Myanmar	Military base or weapons testing	4	https://www.europeaninterest.eu/article/coming-extinction-moken-people-burmas-mergui-archipelago/
Sama, Philipines	Military base or weapons testing	4	https://badjaoculturecom.wordpress.com/2017/07/20/culture-of-badjao-2/
Tupinambá, Brazil	Sewerage	4	(Abaujo et al. 2018).
Guarani, Brazil	Sewerage	4	(Abaujo et al. 2018).
Mapuche Huichille, Chile	Sewerage	2	Author observations
Bijagos, Equitorial Guinea	Industrial fishing	4	(Maderia, 2016).
Kru, Liberia	Industrial fishing	4	https://fcwc-fish.org/about-us/member-states/liberia
Serer people, Gambia	Industrial fishing	4	https://www.bbc.com/future/article/20210323-the-factories-turning-west-africas-fish-into-powder
Sahrawi, Western Sahara, Morocco	Industrial fishing	4	https://www.spsrasd.info/news/en/articles/2018/06/03/15755.html

7.2. Analysis of Blue Justice issues

As can be seen in the table 1 and figure 2 above, blue injustice issues include mining projects, new and bigger ports, aquaculture, and energy introduced in more detail below. They mean those communities without rights are less likely to realise successful bio-cultural conservation, typically resulting from projects supported by nation states in partnership with corporations.

7.1. Submarine tailing mine disposal.

7 cases of Submarine mine tailing pollution are ongoing. This typically sees a pipe emit a mixture of chemicals from mine waste or tailings into coastal waters, below the thermocline at depth. While arguments have been developed for STD that it is an environmentally responsible solution including (Morello et al. 2016 and Kwong et al. 2018) by those in academia connected to industry, it is banned in the countries where those mining companies are headquartered, such as Canada, US and Australia (Coumans et al. 2018). The impacts on marine Indigenous communities have not been described, but this analysis shows there are 4 projects in Papua New Guinea impacting the Kala

people Morobe province, Muyua people in Woodlark island, the Muyuw people on Lihir island and most controversially the Mindiri people, in Madang province where large impacts were reported last year. There are two in Indonesia, Batu Hijau mine open pit copper-gold mine – submarine tailing disposal impacts are against the Sumbawa peoples wishes, like the Minahasa people in Sulawesi (Indonesia) from the Newmont Minahasa mine. Also, in New Caledonia the Kanak people have been impacted in the south of the island.

7.2 Deep seabed mining

While deep seabed mining poses unknown risks in 5 cases, only 1 in PNG where the Tigak people among others in New Ireland PNG, have successfully resisted the project Solwara 1 has any test or other activity occurred. There are 3 cases for potential exploitation in Tonga, Nauru, and Kiribati, without much being clearly concrete. The Cook Islands seem to be the only marine Indigenous nation likely to see any activity however there is civil society resistance in the context of the MPAs in the area concerned. Deep seabed mining can potentially impact species in benthic ecosystems in hydrothermal rifts to coastal species, needing greater stakeholder integration to support the common heritage of mankind (Jaeckal et al. 2017) and the norm of free, prior, and informed consent (FPIC) for Indigenous peoples Aguon, and Hunter, 2018).

7.3. Port development, dredging disposal and land reclamation.

In the context of port development, dredging disposal and land reclamation ecological impacts, there are at least (8) Indigenous marine communities facing impacts here with insufficient rights. These include the Mah Meri community in Malaysia (Hattam et al. 2020), Makassar small scale fishers in Sulawesi (Indonesia) The Yaburrara in Dampier and Kariyarra in Port Hedland Western Australia have had their marine environments impacts by port development for iron and metal mining exportation. The Bali people have had their conservation program severely disrupted by overdevelopment of Benoa Bay, through land reclamation and port development against local wishes (Adharani et al 2020). Similarly, the Kutch people in Gujarat India, and the Baluch's from Gwandar port in Pakistan, have had small scale fisheries and conservation challenges (Kohli et al. 2016).

7.4 Oil and gas development

There are at least 10 marine Indigenous nations here with problems with oil and gas development, the Heiltsuk historically successfully stopped the Enbridge gas pipe going to their coast into the sea,

and today are challenging the trans mountain pipeline among other coastal First Nations in British Colombia against Petrochemical exportation, the Great Bear Coastal Stewardship initative has a tanker ban in their waters. However, some nations have been supportive (Wood and Rossiter, 2017). In Russia, the Nivkh people of Sakhalin island have protested against fisheries and other marine contamination impacts from offshore oil, and the Nenets against the Gas infrastructure taking away access to the coast for reindeers and fishing in the Yamal peninsula (Degteva and Nellemann 2013). The Eyak conservation society continues to campaign against petrochemical development in their seas in Alaska. In the Niger delta region, the Biafra group including Ebono and Ijaw people among others continue a campaign against Shell estuarine and marine impacts (Obi, 2010). Similarly, the Bubi people's small-scale fisheries continue to pollute in Equatorial Guinea. Additionally, the Wayuu in Colombia have stopped seismic testing in their sacred marine area, but pressure remains to get leaders to take money for other developments around the coast (Hassler, 2015).

7.5 Military / Naval base development impacts

There are at least 8 cases, including the Chamorro people of Guam have experienced historic agent purple poisoning – thought still to have a lingering impact. They claim that new military base impacts on sacred marine / land site Ritidian from the new US Marine Corps base, Camp Blaz (Frain, 2020). Local fishers and others to be barred access. Similarly, the Indigenous Hawaiian community continue to raise concerns on marine life impacts on the Johnston Atoll – still poisoned with agent orange, and weapons testing on marine coastal sites in the Big Island Pohakuloa Training Area (Lutz, 2019). Additionally, in Okiniwa, Ruyuku people have a similar issue from an American base, and the Spratly islands have recently been colonised by China (Moreira, 2020).

7.6 Nuclear impacts and power stations

3 nuclear cases, including the nuclear dump site organised by the Taiwanese government on Pongso No Tao (Orchid) Island, which continues to energise protests, including artisanal fishers from the Tao community (Fan, 2009). This interrupts traditional ecological wisdom and the customary fisheries management system. The Marshallese people have their fisheries and conservation potential limited by the The 'Dome' on Runit island entombed nuclear waste which is leaking radiation into the sea, alongside the historic impacts of nuclear testing on the Bikini atoll and Enewetak lagoon people (Pevec, 2006). Historic nuclear testing and contamination Fangataufa and Moruroa lagoons part of the Tuamotu Archipelago remains out of access as a military zone (Keown, 2018). Organised by the Taiwanese government, the nuclear dump site on Lanyu or (Orchid) Island continues to energise protests, including artisanal fishers from the Tao community (Fan, 2009).

7.7 Sewerage

At least 2 cases of this underreported issue, in the Sao Paulo to Rio De Janiero area, significant sewerage and urban contamination problems continue to impact Tupinambá and Guarani Indigenous communities among other coastal peoples (Abaujo et al. 2018). Other research indicates that this is also impacting Mapuche Huichille in Chile, and close to Kula Lumpar Malaysia (Hattam et al. 2020) there is likely to more elsewhere.

7.8 Aquaculture

4 Cases including the Mapuche Huichille people and Kawashkar people of southern Chile in the Los Lagos region have been particularly impacted by massive salmon farming expansion impacts around the coasts and islands (Anbleyth-Evans et al. 2020). Similar challenges have been faced by Atlantic salmon farms by Pacific coastal first nations Kwakwaka'wakw and Nuu-chah-nulth (Heaslip, 2008).

7.9 Industrial migratory fishing

4 cases are listed above, although this is likely a massive underestimate globally. Kru people in Liberia have developed coastal marine protected areas but like the Jola people of Senegal, foreign industrial migratory fishers are overharvesting pelagic fish (Belhabib et al. 2015) also thought to impact the Bijagos (Maderia, 2016). These are counted in figure 3 below.

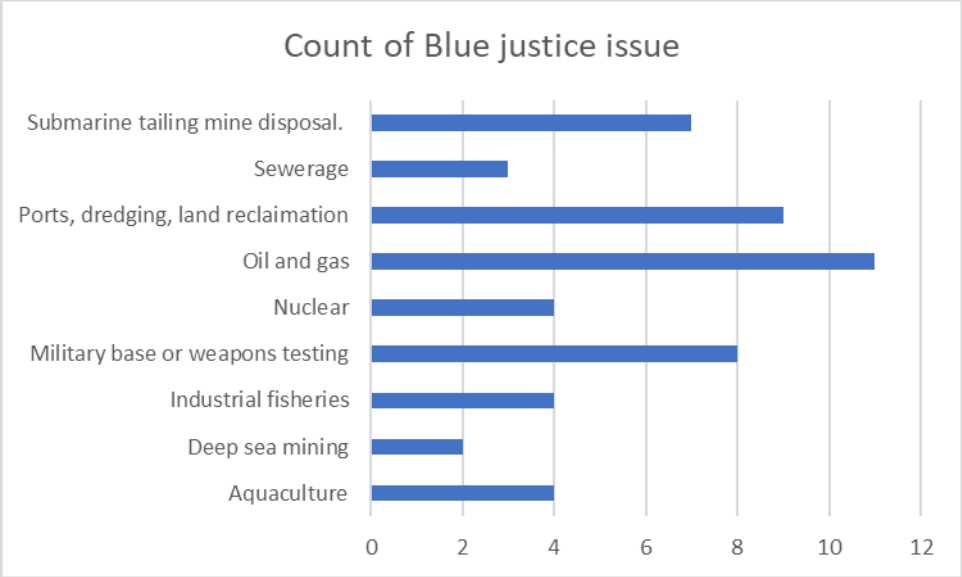

Figure 3 Showing the count of 53 distilled blue justice issues identified in more detail from table 1

8.1 Analysis of marine indigenous rights categories

While progress is being made for marine Indigenous rights in many regions, particularly around Oceania, and some parts of Asia and South America, as shown in table 1 and annex 1, others are in more precarious stages of formal or even tacit recognition. Those without rights appear to be most vulnerable to these projects, as while they may object to their development, often they have no power to stop them. This article shows that Indigenous "nations" that have the greatest rights in terms of informal or formal recognition of their marine territories by governments are having the most success in realising marine resource conservation/management and environmental justice. Realisation of sovereignty and access rights is connected to having the autonomy to potentially conserve the local environment (Raymond-Yakoubian, et al. 2018, Bennett et al. 2018, Ban et al. 2018 and. Craig, 2018 and Jentoft et al. 2019). This specifically entails being able to develop local informal customary and/or legal regimes based on historic culture and language necessary for the contemporary conservation challenges (Temper et al. 2019). In contrast to formal state led marine conservation areas, recognised customary systems are in principle adequately empowered to also support biocultural diversity conservation (Warren, 1996 and Maffi, 2005). This premise is firstly based on conserving the relationship between biological, linguistic, and cultural diversity (Davidson-Hunt et al. 2012), which can be protected by recognising Indigenous rights to marine Indigenous territories and for Indigenous people to enact their own conservation if they deem such strategy as advantageous or desirable. This can be best achieved by means of integrating Traditional and Local Ecological Knowledge (TEK/LEK) systems with scientific conservation systems into regimes of Indigenous governance in a nation´s own terms (Berkes 1999). This can give Indigenous nations the opportunity to review the impacts of ports, energy development, aquaculture (Anbleyth-Evans, 2020) among other developments further discussed in this paper.

This is important given the extent most of these Indigenous communities continue a different epistemic approach of relational values. Relational values entail having a specific social organisational relationship to local ecosystems and the concomitant economic, social, and spiritual connections to that space (e.g., Klain et al. 2017; Chan et al. 2016; Mureca, 2011). While there has been a relational turn in the ecosystem service / management literature, emphasising a deeper focus

on relational values in addition to instrumental and intrinsic values is important, as early identified by Kroeber (1939), Steward (1955), and Sauer (1956) in an anthropological context.

The different categories of marine Indigenous rights and the capacity for marine management / conservation are now discussed. As Category 1 featured 9 newly independent marine Indigenous who have no blue justice issues, Category 2 will be discussed next.

8.2 Category 2 (66) Indigenous nations that are formally or legally recognised by states as having rights and can or do develop their own conservation initiatives for fisheries and other management (with or without exterior stakeholders for assistance).

In the context of marine management and conservation, many marine Indigenous communities who have legal recognition are leading. For example, at least forty of the marine Indigenous groups listed in annex 1 are leading or involved in some form of LMMAs or IPAs or participatory MPAs. These often build on existing Indigenous systems, and new ideas to enhance conservation around the Pacific and Indian Oceans (Govan et al. 2009 and Roecliffe et al. 2014).

Of those varieties of IPAs, LMMAs and similar rights, 75.3 % did not have blue justice issues. They simultaneously had a strategy for realising conservation, such as the LMMAs and MPAs around the Pacific small island nations. These often build on existing Indigenous systems, and new ideas to enhance conservation around the Pacific and Indian Oceans (Govan et al. 2009 and Roecliffe et al. 2014).

8.3 Category 3 Indigenous nations/communities that can or do develop marine management / conservation interventions for fisheries, such as based on customary systems, but legal / territorial rights for autonomy are not yet fully recognized.

In this category, 32 marine Indigenous nations were identified as having some capacity to be involved in contemporary management / conservation interventions. They have been successful but not had legal / territorial rights. These include those that are involved in MPAs that have been inclusive in some form in the planning, thus supporting future rights, such as new treaties in Canada, or the MPA in Chile which includes the traditional authorities in Rapa Nui.

8.4 Category 4 Those without rights, who have previously had customary systems and are unable to develop marine management / marine conservation initiatives Category 4 92 cases.

There is also a huge diversity of marine Indigenous nations who previously maintained customary management systems but today are unable to develop marine management and conservation initiatives around the world. While we recorded 92 in this category, the article of (Cisneros-Montemayor et al. 2016) suggests that there are approximately 2000 with different forms of rights.

Challenges for realising Blue decolonial Justice.

Given the diversity of these blue justice issues, achieving some form of marine governmental legal rights, seen with the LMMAs in the Pacific, the IPAs in Australia, and MPAs in newly independent nations, may be the best recipe for realising decolonial blue justice. This can allow communities real participation in decisions and being at least part, if not leading participatory marine conservation planning. More communities affected are described in the excel in the annex, however highlighted blue justice case studies are picked out in table 1.

8. Realising blue justice through TEK in marine democracy

Beyond what Menton et al. (2020) identifies as mainstream environmental justice, this article aims to underline how realising participatory environmental justice in governance is just the first step in realising blue justice for Indigenous nations and marine democracy. In the context of marine environmental rights, which includes access to environmental information and participation in decision making (Barnes, 2018). Local / Indigenous / or fisher Traditional Ecological Knowledge (TEK) in this context interplays with a right to participation, distributive, recognitional and epistemic justice. Epistemic justice, the right for the Indigenous community and fishers' way of knowing to be considered valid and other stakeholders in the community (Anbleyth-Evans, 2018). TEK can often be expressed through a minority language and culture, different to the dominant language and culture of the nation state (Berkes, 2000). Intrinsic to TEK are the different epistemologies and ontologies of the knowledge communities. These are often connected to local religions, which within TEK communities are often connected to the protection of the sea and land (Folke, 2004 and Stephenson, 2014). Connection to place based protection has been proven to be important for conserving biodiversity (Hausmann et al. 2018). While TEK is used here, fisher LEK is also mentioned as many Indigenous fishers as possible in marine Indigenous communities know about ecological changes through artisanal or subsistence fishing.

Thus, TEK involvement can improve ecological monitoring, build trust fill gaps that scientists cannot reach, and improve understanding of a potentially polluting situation such as a port development, aquaculture impacts or commercial fishing for the wider coastal community (Wilson and Kleban, 1992, Garcia-Quijano, 2007 Johannes et al., 2008 and Anbleyth-Evans and Williams, 2018). Where Indigenous nations can make decisions on projects based on their own world views and traditional legal frameworks which have given rise to various customary rights and taboos regarding overharvesting, and spatial zoning could be described as decolonial blue justice.
For example, taboo areas for fisheries or sacred / culturally significant areas might be ignored or eradicated by the state approved projects highlighted here.

For example, considering example in table 1 above, the Heiltsuk in British Columbia are the odd ones out who managed to oppose the Enbridge pipeline, thanks to their marine rights and the support of others in the coastal first nation coastal guardianship programme. It remains to be seen whether the Trans-mountain pipeline will be successfully opposed by this group however their literature would suggest so (Coastal First Nations, 2020).
Effectively, if these groups were given adequate rights, they would be able to make participatory decisions to realise blue decolonial justice, and marine planning for conservation on their own terms. The analysis of the 9 independent Pacific Indigenous nations suggests through their historic connections to the sea they are making great effort to conserve it, with each having significant LMMAs or conservation areas. Having simultaneous community led conservation zones which are connected to a local parliament such as in the 9 independent Pacific nations, where people can have face to face relations, thanks to a small population, means such projects can be debated as rights to create local legislation are realised. This can be called a marine ecological democracy, where the ecological observations of humans in the marine ecosystem of such impacts, are conceptualised as part of a compact, an ongoing dialogue between humans and other local species.

While the UNESCO programme is working to promote ‘hope spots’, and marine heritage conservation designation, the work lacks a biocultural dimension, focusing only on marine conservation of natural / wildlife features except in the case of Ibiza which is not an Indigenous community (UNESCO, 2020). As seen in New Caledonia, the UNESCO designation did little to stop the pipe from onshore mining contaminating coastal waters in Indigenous fisheries grounds (Horowitz 2018). This is because while the designation recognised the importance of the lagoon and coral reef ecosystem network, it only suggested conservation initiatives upon small scale fisheries practice. East Rennel in the Solomon Islands, the only natural World Heritage site in the Pacific that

is on the Danger List was impacted by the oil spill of the MV Solomon Trader in 2019. However, because qualification neglects the bio-cultural dimension, such as cultural seascapes (Shackeroff et al. 2009), connected to marine Indigenous rights for governance, over such planning issues, there are not yet more examples. A similar point can be made regarding the recent Blue Justice Initiative (BJI) from the UN Development Programme. This is only focused on Transnational Organized Crime in the global Fishing Industry, not including injustice from blue growth issues (BlueJustice.org, 2020).

10. Other organisational challenges to realise marine Indigenous conservation.

In many different countries analysed, specifically, Panama, Costa Rica, Nicaragua and Honduras among others, different ethnic groups have been lumped together to create territorial rights, and related marine Indigenous tenures, making them potentially less successful in realising bio-cultural conservation. There are also examples of marine Indigenous communities who were apparently in relative sustainability in the past but have gone onto overexploit marine life in a wider context of social and economic instability, including the Miskitos in Nicaragua, the Wayuus in Venezeuela, Bajuns and Mijikenda in Kenya. There are opportunities to partner with human geographers, conservation scientists and NGOs in these contexts, to develop participatory marine conservation planning.

Conclusion

This research shows that marine Indigenous communities in their diversity of cultures, represent some of the best potential partners for realising participatory marine conservation. Through their often deeply relational values with local ecosystems and nature in general, these communities enjoy different epistemic approaches to western capitalist nations. At the same time, marine conservation in its growing popularity and prestige, offers one of the best opportunities to realise rights and recognition on the path back towards greater independence and like the marine species we are entwined with, survival.

Bibliography

Adhuri, D. S. (2018). The State and Empowerment of Indonesian Maritime Culture: The Case of Traditional Marine Resource Management. Journal of Ocean and Culture, 1, 18-34.
Adharani, Y., Astriani, N., & Sarah Afifah, S. (2020). BENOA BAY RECLAMATION: THE IMPACT OF POLICY-MAKING FOR SOCIAL AND ENVIRONMENT. Humanities & Social Sciences Reviews, 8(4), 1227-1239. https://doi.org/10.18510/hssr.2020.84116
Aguon, J., & Hunter, J. (2018). Second Wave Due Diligence: The Case for Incorporating Free, Prior, and Informed Consent into the Deep Sea Mining Regulatory Regime. *Stan. Envtl. LJ*, *38*, 3.

Andrews, N., Bennett, N. J., Le Billon, P., Green, S. J., Cisneros-Montemayor, A. M., Amongin, S., ... & Sumaila, U. R. (2021). Oil, fisheries and coastal communities: A review of impacts on the environment, livelihoods, space and governance. Energy Research & Social Science, 75, 102009.
Andriamalala, G., Peabody, S., Gardner, C. J., & Westerman, K. (2013). Using social marketing to foster sustainable behaviour in traditional fishing communities of southwest Madagascar. Conservation Evidence, 10, 37-41.
Apgar, J. M., Ataria, J. M., & Allen, W. J. (2011). Managing beyond designations: supporting endogenous processes for nurturing biocultural development. International Journal of Heritage Studies, 17(6), 555-570.
Araujo, G. S., Moreira, L. B., Morais, R. D., Davanso, M. B., Garcia, T. F., Cruz, A., & Abessa, D. (2013). Ecotoxicological assessment of sediments from an urban marine protected area (Xixová-Japuí State Park, SP, Brazil). Marine Pollution Bulletin, 62-68.
Araos, F., & Ther, F. (2017). How to adopt an inclusive development perspective for marine conservation: preliminary insights from Chile. Current opinion in environmental sustainability, 24, 68-72.
Artelle, K. A., Zurba, M., Bhattacharrya, J., Chan, D. E., Brown, K., Housty, J., & Moola, F. (2019). Supporting resurgent Indigenous-led governance: A nascent mechanism for just and effective conservation. Biological Conservation, 240, 108284.
Aswani, S. and R.J. Hamilton. (2004). Integrating indigenous ecological knowledge and customary sea tenure with marine science and social science for conservation of bumphead parrotfish (Bolbometopon muricatum) in the Roviana Lagoon, Solomon Islands. Environmental Conservation, 31, 69–83.

Aswani, S., S. Albert, and M. Love. (2017). One size does not fit all: Critical insights for effective community-based resource management in Melanesia. Marine Policy 81:381-391. DOI: 10.1016/j.marpol.2017.03.041
Aswani, S. X. Basurto, I. Vaccaro, L. Campbell1, P. Christie, J. Cinner, T. Dalton, K. Jenkins, M. Miller, S. Ferse, R. Pollnac. (2018). Marine resource management and conservation in the Anthropocene. Environmental Conservation, doi: 10.1017/S0376892917000431
Aswani, S. (2019). Perspectives in coastal human ecology (CHE) for marine conservation. Biological conservation, 236, 223-235.
Aswani S, C. Carolina, M. Stäbler and S. Ferse. (2020). Detecting Change in Local Ecological Knowledge: An Application of an Index of Taxonomic Distinctness to an Ethnoichthyological Classification in the Solomon Islands. Ecological Indicators. https://doi.org/10.1016/j.ecolind.2020.106865
Balmford, A., Gravestock, P., Hockley, N., McClean, C. J., & Roberts, C. M. (2004). The worldwide costs of marine protected areas. Proceedings of the National Academy of Sciences, 101(26), 9694-9697.
Ban, N. C., & Frid, A. (2018). Indigenous peoples' rights and marine protected areas. Marine Policy, 87, 180-185.

Barbesgaard, M. (2018). Blue growth: Savior or ocean grabbing? The Journal of Peasant Studies, 45(1), 130-149. DOI: 10.1080/03066150.2017.1377186
Barrios-Garrido, H. A., Montiel-Villalobos, M. G., Palmar, J., & Rodríguez-Clark, K. M. (2020). Wayuú capture of green turtles, Chelonia mydas, in the Gulf of Venezuela: A major Caribbean artisanal turtle fishery. Ocean & Coastal Management, 188, 105123.
Belhabib, D., Sumaila, U. R., Lam, V. W., Zeller, D., Le Billon, P., Abou Kane, E., & Pauly, D. (2015). Euros vs. Yuan: comparing European and Chinese fishing access in West Africa. *PloS one*, *10*(3), e0118351.

Bennett, N. J., Kaplan-Hallam, M., Augustine, G., Ban, N., Belhabib, D., Brueckner-Irwin, I., ... & Foley, P. (2018). Coastal and Indigenous community access to marine resources and the ocean: a policy imperative for Canada. Marine Policy, 87, 186-193.

Bennett, N. J., Blythe, J., White, C. S., & Campero, C. (2021). Blue growth and blue justice: Ten risks and solutions for the ocean economy. Marine Policy, 125, 104387.
Berkes, F. (1999). [2017]. Sacred ecology. London, Routledge.
Berkes, F. Colding, J. and Folke, C. (2000). Rediscovery of Traditional Ecological Knowledge as Adaptive Management. Ecological Applications, 10, 5, 1251-1262.
Blue Justice. (2020) https://bluejustice.org/blue-justice-initiative/ (As accessed, 2.12.20).
Borrini, G., Jaireth, H., Farvar, M. T., Pimbert, M., Renard, Y., Kothari, A., ... & Ramrez, R. (2007). Sharing power: learning-by-doing in co-management of natural resources throughout the world. Earthscan.
Buscher, E. (2019). Supporting indigenous marine conservation planning: a case study of the Songhees Nation (Doctoral dissertation).

Capistrano, R. C. G. (2010). Reclaiming the ancestral waters of indigenous peoples in the Philippines: The Tagbanua experience with fishing rights and indigenous rights. Marine Policy, 34(3), 453-460.
Charpleix, L., 2018. "The Whanganui River as Te Awa Tupua: Place-
Based Law in a Legally Pluralistic Society." Geographical Journal
184:19–30
Christie, P. (2004). Marine protected areas as biological successes and social failures in Southeast Asia. American Fisheries Society Symposium. Vol. 42: 155–164.
Chuenpagdee, R. (Ed.). (2011a). World small-scale fisheries. Contemporary visions. Delft: Eburon.
Chuenpagdee, R. (2011b). Thinking big on small-scale fisheries. In V. Christensen & J. Maclean (Eds.), Ecosystem approaches to sheries: A global perspective (pp. 226–240). Cambridge: Cambridge University Press.
Cinner JE, Wamukota A, Randriamahazo H, Rabearisoa A (2009) Toward institutions for community-based management of inshore marine resources in the Western Indian Ocean. Mar Policy 33: 489–496
Cinner, J. E., Basurto, X., Fidelman, P., Kuange, J., Lahari, R., & Mukminin, A. (2012). Institutional designs of customary fisheries management arrangements in Indonesia, Papua New Guinea, and Mexico. Marine Policy, 36(1), 278-285.
Cisneros-Montemayor, A. M., Pauly, D., Weatherdon, L. V., & Ota, Y. (2016). A global estimate of seafood consumption by coastal indigenous peoples. PLoS One, 11(12), e0166681.
https://www.congresonacionalindigena.org/
Cisneros-Montemayor, A. M., Moreno-Báez, M., Voyer, M., Allison, E. H., Cheung, W. W., Hessing-Lewis, M., ... & Ota, Y. (2019). Social equity and benefits as the nexus of a transformative Blue Economy: A sectoral review of implications. Marine Policy, 109, 103702.

Coastal First Nations. (2020). TANKER BAN AND DEATH OF NORTHERN GATEWAY PIPELINE. https://coastalfirstnations.ca/our-sea/protecting-our-coast/ (As accessed, 9.12.20).

Cocks, M. L., Dold, T., & Vetter, S. (2012). 'God is my forest': Xhosa cultural values provide untapped opportunities for conservation. South African Journal of Science, 108(5-6), 52-59.
Coumans, ñC. (2018). Into the deep: science, politics and law in conflicts over marine dumping of mine waste. International Social Science Journal, 68(229-230), 303-323.
Crumley, C. L. (1994). Historical ecology: a multidimensional ecological orientation. Historical ecology: Cultural knowledge and changing landscapes, 1-16.
Davidson-Hunt, I. J., Turner, K. L., Mead, A. T. P., Cabrera-Lopez, J., Bolton, R., Idrobo, C. J., ... & Robson, J. P. (2012). Biocultural design: a new conceptual framework for sustainable development in rural indigenous and local communities. SAPI EN. S. Surveys and Perspectives Integrating Environment and Society, (5.2).
Davies, K., Murchie, A. A., Kerr, V., & Lundquist, C. (2018). The evolution of marine protected area planning in Aotearoa New Zealand: Reflections on participation and process. Marine Policy, 93, 113-127.
Degteva, A., & Nellemann, C. (2013). Nenets migration in the landscape: impacts of industrial development in Yamal peninsula, Russia. Pastoralism: Research, Policy and Practice, 3(1), 1-21.
Dureuil, M., Boerder, K., Burnett, K. A., Froese, R., & Worm, B. (2018). Elevated trawling inside protected areas undermines conservation outcomes in a global fishing hot spot. Science, 362(6421), 1403-1407.
FAO (2015) Voluntary guidelines for supporting sustainable small-scale fisheries in the context of food security and poverty eradication. http://www.fao.org/3/a-i4356e.pdf. Accessed 28 Mar 2018
Fache, E., & Pauwels, S. (2020). Tackling coastal "overfishing" in Fiji: advocating for indigenous worldview, knowledge, and values to be the backbone of fisheries management strategies. Maritime Studies, 1-12.
Fan, M. F. (2009). Public perceptions and the nuclear waste repository on Orchid Island, Taiwan. *Public Understanding of Science*, *18*(2), 167-176.

Folke, C. (2004). Traditional Knowledge in Social–Ecological Systems. Ecology and Society, 9(3): 7.
Frain, S. (2020). A Defence Democracy 'in'the United States: Gender and Politics in the Unincorporated Territory of Guam. *Small States & Territories Journal*, *3*(2), 319-338.
Fraser, N. (2000). Rethinking recognition. New left review, 3, 107.
Garnett, S. T., Burgess, N. D., Fa, J. E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C. J., ... & Collier, N. F. (2018). A spatial overview of the global importance of Indigenous lands for conservation. Nature Sustainability, 1(7), 369.
Foster, K. B., & Poggie Jr, J. J. (1993). Customary marine tenure and mariculture management in outlying communities of Pohnpie State, Federated States of Micronesia. Ocean & coastal management, 20(1), 1-22.
Geismar, H. (2013). Treasured possessions: indigenous interventions into cultural and intellectual property. Duke University Press.
González, M. (2017). Beyond the small-scale fisheries guidelines: tenure rights and informed consent in indigenous fisheries of Nicaragua. In The Small-Scale Fisheries Guidelines (pp. 191-212). Springer, Cham.
Govan, H. et al. (2009). Status and potential of locally-managed marine areas in the South Pacific: meeting nature conservation and sustainable livelihood targets through wide-spreadimplementation of LMMAs. SPREP/WWF/WorldFish-Reefbase/CRISP. 95pp + 5 annexes.
Govan, H. (2015). Area-Based Management Tools for Coastal Resources in Fiji, Kiribati, Solomon Islands, Tonga And Vanuatu. Volume 1: Status, capacity and prospects for collaborative resource

management. Volume 2: Country reports. Report for the Marine and Coastal Biodiversity Management in Pacific Island Countries (MACBIO) project, Suva, Fiji Islands.
Hassler, M. (2015). Is the tide turning? Mobilizing indigenous rights for Environmental Justice: A case study from extractive projects in La Alta Guajira, Colombia. Masters thesis. http://lup.lub.lu.se/student-papers/record/7854103 (As accessed, 5.12.20).
Hattam, C., Goh, H. C., Then, A. Y. H., Edwards-Jones, A., Ruslan, N. F. N., Yap, J. S. E., & Moh, H. H. (2020). Using nexus thinking to identify opportunities for mangrove management in the Klang Islands, Malaysia. *Estuarine, Coastal and Shelf Science*, 106917.
Hausmann, A., Slotow, R. O. B., Burns, J. K., & Di Minin, E. (2016). The ecosystem service of sense of place: benefits for human well-being and biodiversity conservation. Environmental conservation, 43(2), 117-127.
Heaslip, R. (2008). Monitoring salmon aquaculture waste: The contribution of First Nations' rights, knowledge, and practices in British Columbia, Canada. *Marine Policy*, *32*(6), 988-996.

Henriques, A and Campredon, P. (2012). "From sacred areas to the creation of marine protected areas in the Bijagós archipelago (Guinea Bissau, West Africa)." UNESCO Sustainable Development in Coastal Regions and Small Islands. (PDF).
Hong, S. K. (2013). Biocultural diversity conservation for island and islanders: necessity, goal and activity. Journal of marine and island cultures, 2(2), 102-106.
Houk, P., Camacho, R., Johnson, S., McLean, M., Maxin, S., Anson, J., and van Woesik, R. (2015). The Micronesia Challenge: assessing the relative contribution of stressors on coral reefs to facilitate science-to-management feedback. PlOS one, 10(6), e0130823

Horowitz, L. S. (2016). Rhizomic resistance meets arborescent assemblage: UNESCO World Heritage and the disempowerment of indigenous activism in New Caledonia. Annals of the American Association of Geographers, 106(1), 167-185.
Ichikawa, M. (2001). Understanding the fishing rights of the Ainu of Japan: lessons learned from American Indian law, the Japanese constitution, and international law. Colo. J. Int'l Envtl. L. & Pol'y, 12, 245.
ILO (International Labour Organization) (1989) C169 – Indigenous and Tribal Peoples Convention, 1989 No 169.
IUCN (2019). Recognising and reporting other effective area-based conservation measures https://portals.iucn.org/library/sites/library/files/documents/PATRS-003-En.pdf
Jennings S (2009) The role of marine protected areas in environmental management. ICES J Mar Sci 66: 16–21.
Jaeckel, A., Gjerde, K. M., & Ardron, J. A. (2017). Conserving the common heritage of humankind–Options for the deep-seabed mining regime. *Marine policy*, *78*, 150-157.

Jentoft S, Minde H, Nilsen R (eds) (2003) Indigenous peoples: resource management and global rights. Eburon Academic Publishers, Delft
Jentoft, S., Stacey, N., Sunde, J., & González, M. (2019). The Small-Scale Fisheries of Indigenous Peoples: A Struggle for Secure Tenure Rights. In Transdisciplinarity for Small-Scale Fisheries Governance (pp. 263-282). Springer, Cham.
Jonas, H., & MacKinnon, K. (2016). Advancing Guidance on Other Effective Area-based Conservation Measures: Report of the Second Meeting of the IUCNWCPA Task Force on Other Effective Area-based Conservation Measures. Bundesamt für Naturschutz.
Kassam, K. A. (2009). Biocultural diversity and indigenous ways of knowing: human ecology in the Arctic. University of Calgary Press.
Keown, M. (2018). Waves of destruction: Nuclear imperialism and anti-nuclear protest in the indigenous literatures of the Pacific. *Journal of Postcolonial Writing*, *54*(5), 585-600.

Kohli, K., & Menon, M. (2016). The Tactics of Persuasion: Environmental negotiations over a corporate coal project in coastal India. Energy Policy, 99, 270-276.
Kroeber, A. L. (1939). Cultural and natural areas of native North America (Vol. 38). University of California Press.
Kymlicka, W. (2007). National cultural autonomy and international minority rights norms. Ethnopolitics, 6(3), 379-393.
Leenhardt, P., Cazalet, B., Salvat, B., Claudet, J., & Feral, F. (2013). The rise of large-scale marine protected areas: conservation or geopolitics?. Ocean & Coastal Management, 85, 112-118.
Liu, N., & Brooks, C. M. (2018). China's changing position towards marine protected areas in the Southern Ocean: Implications for future Antarctic governance. Marine Policy, 94, 189-195.
Löfmarck, E., & Lidskog, R. (2017). Bumping against the boundary: IPBES and the knowledge divide. Environmental Science & Policy, 69, 22-28.
Luque, D., and Doode, S. (2007). Sacralidad, territorialidad y biodiversidad Comcáac (seri). Los sitios sagrados indígenas como categorías de conservación ambiental. Relaciones. Estudios de historia y sociedad, 28(112), 157-184.
Lutz, C. (2019). Bureaucratic weaponry and the production of ignorance in military operations in Guam. *Current Anthropology*, *60*(S19), S108-S121.

Madeira, J. P. (2016). Bijagos Archipelago: Impacts and challenges for environmental sustainability. Revista de Geografia e Interdisciplinaridad, v. 2, n. 5 p. 291-305 DOI: 10.18766/2446-6549/interespaco.v2n5p291-305
Maffi, L. (1998). Language: a resource for nature. Nature and resources UNESCO Journal on the Environment and Natural Resource Research, 34 (4) pp. 12-21.
Maffi, L. (2005). Linguistic, cultural, and biological diversity. Annual Review of Anthropology, 34, 599-617.
Matitaputty, J. K., Syamsuddin, H., Maryani, E., & Ali, M. (2018). Contributions of Sasi to Sustainable Living of Saparua Indigenous Community, Indonesia. In Annual Civic Education Conference (ACEC 2018). Atlantis Press.
McClanahan T., Marnane M., Cinner J. & Kiene W. (2006) A comparison of marine protected areas and alternative approaches to coral reef conservation. Current Biology, 16, 1408-1413.
McNiven, I. (2004). Saltwater people: spiritscapes, maritime rituals and the archaeology of Australian indigenous seascapes. World Archaeology, 35(3), pp.329-349.
Mackinnon J. B., and L. McClenachan. 2015. “Twelve Choice without Memory: Uncovering the Narrative Potential of Historical Ecology.” In Marine Historical Ecology in Conservation: Applying the Past to Manage for the Future, edited by J. Kittinger, L. Mc- Clenachan, K. B. Gedan, and L. K. Blight, 265–76. Berkeley:
University of California Press.
Moreira, F. K. (2020). The Fishing Rights of Indigenous Peoples in the Context of the Global Governance of the Seas. Ocean Yearbook Online, 34(1), 136-163.
Muraca, B. (2011). The Map of Moral Significance: A New Axiological Matrix for Environmental Ethics. Environmental Values, 20(3), 375-396.
Narchi, N.E., Price, L.L. (Eds.). (2015). Ethnobiology of Corals and Coral Reefs. Springer.
Nietschmann, B. (1995). Defending the Miskito reefs with maps and GPS: mapping with sail, SCUBA, and satellite. Cultural Survival Quarterly 18, 34–36.
Nursey-Bray, M. (2011). Social Contexts and Customary Fisheries: Marine Protected Areas and Indigenous Use, Australia. Environmental Management, 47, 671-683.
https://www.researchgate.net/profile/Melissa_Nursey-Bray/publication/45800843_Social_Contexts_and_Customary_Fisheries_Marine_Protected_Areas_and_Indigenous_Use_Australia/links/54c96e730cf2f0b56c239165/Social-Contexts-and-Customary-Fisheries-Marine-Protected-Areas-and-Indigenous-Use-Australia.pdf

Obi, C. I. (2010). Oil extraction, dispossession, resistance, and conflict in Nigeria's oil-rich Niger Delta. Canadian Journal of Development Studies/Revue canadienne d'études du développement, 30(1-2), 219-236.
Orensanz, Jose Maria; Cinti, Ana; Parma, Ana Maria; Burotto, Lorena; Espinosa Guerrero, Silvana; et al.; Latin American rights-based fisheries targeting sedentary resources. Part I; Food and Agriculture Organization of the United Nations; FAO Fisheries and Aquaculture Technical Papers; 582; -1-2013; 1-69
Ou, Z., & Ma, G. (2017). Marginalisation of the Dan fishing community and relocation of Sanya fishing port, Hainan Island, China. *Island Studies Journal*, *12*(2).

Pert, P. L., Hill, R., Maclean, K., Dale, A., Rist, P., Schmider, J., ... & Tawake, L. (2015). Mapping cultural ecosystem services with rainforest aboriginal peoples: integrating biocultural diversity, governance and social variation. Ecosystem Services, 13, 41-56.
Petit, I. J., Campoy, A. N., Hevia, M. J., Gaymer, C. F., & Squeo, F. A. (2018). Protected areas in Chile: are we managing them?. Revista chilena de historia natural, 91(1), 1.
Pevec, D. (2006). The Marshall Islands nuclear claims tribunal: the claims of the Enewetak people. Denv. J. Int'l L. & Pol'y, 35, 221.
Poepoe, K., P. Bartram, and A. Friedlander. 2003. The use of traditional Hawaiian knowledge in the contemporary management of marine resources. In Putting fishers knowledge to work, 328–39. Vancouver, BC: Fisheries Centre Research Report, University of British Columbia.
Prasetyo, N. (2019). Indigenous knowledge and practices for marine ecotourism development in Misool, Raja Ampat, Indonesia (Doctoral dissertation, University of Otago).
Pretty, J., Adams, B., Berkes, F., De Athayde, S. F., Dudley, N., Hunn, E., ... & Sterling, E. (2009). The intersections of biological diversity and cultural diversity: towards integration. Conservation and Society, 7(2), 100-112.
Quileute Nation. (2019). MARINE USA COMPARISON MAP https://quileutenation.org/natural-resources/09-1/map/ (As accessed, 03.06.20).
Raymond-Yakoubian, J., & Daniel, R. (2018). An Indigenous approach to ocean planning and policy in the Bering Strait region of Alaska. Marine Policy, 97, 101-108.
Rist, P., Rassip, W., Yunupingu, D., Wearne, J., Gould, J., Dulfer-Hyams, M., ... & Smyth, D. (2019). Indigenous protected areas in Sea Country: Indigenous-driven collaborative marine protected areas in Australia. Aquatic Conservation: Marine and Freshwater Ecosystems, 29, 138-151.
Rocliffe, S., Peabody, S., Samoilys, M., & Hawkins, J. P. (2014). Towards a network of locally managed marine areas (LMMAs) in the Western Indian Ocean. PloS one, 9(7), e103000.
Rössler, M. (2006) World Heritage Cultural Landscapes: A UNESCO flagship programme 1992-2006. Landscape Res. 31(4): 333-353. DOI : 10.1080/01426390601004210
Rozzi, R., F. Massardo, C. Anderson, K. Heidinger, and J. A. Silander, Jr. (2006). Ten principles for biocultural conservation at the southern tip of the Americas: the approach of the Omora Ethnobotanical Park. Ecology and Society 11(1): 43.
Rozzi, R., Massardo, F., & Poole, A. (2020). The “3Hs” of the Biocultural Ethic: A “Philosophical Lens” to Address Global Changes in the Anthropocene.
Sejersen, F. (2004). Horizons of sustainability in Greenland: Inuit landscapes of memory and vision. Arctic Anthropology, 41(1), 71-89.
Shackeroff, J.M., Hazen, E.L. and Crowder, L.B., (2009). The oceans as peopled seascapes. Ecosystem-based management for the oceans, pp.33-54.
Shackeroff, J. M., Campbell, L. M., & Crowder, L. B. (2011). Social-ecological guilds: putting people into marine historical ecology. Ecology and Society, 16(1).
Simpson, K. (2019). "Overlooked fisheries of Baduwa’t: An oral history study exploring the environmental and cultural histories of eulachon and Pacific lamprey in the Mad River basin, a Wiyot watershed" (2019). HSU theses and projects. 337.

https://digitalcommons.humboldt.edu/etd/337

Stacey, N., Acciaioli, G., Clifton, J., & Steenbergen, D. J. (2017). Impacts of marine protected areas on livelihoods and food security of the Bajau as an indigenous migratory people in maritime Southeast Asia. Marine protected areas: Interactions with fishery livelihoods and food security, 113-126.
Steffen, W. L., Rockström, J., & Costanza, R. (2011). How defining planetary boundaries can transform our approach to growth. Solutions: For A Sustainable & Desirable Future.
Stephenson, J., Berkes, F., Turner, N. J., & Dick, J. (2014). Biocultural conservation of marine ecosystems: examples from New Zealand and Canada. Indian Journal of Traditional Knowledge Vol. 13 (2), pp. 257-265. http://nopr.niscair.res.in/handle/123456789/27907
Steward, J. (1955). Theory of Culture Change: The Methodology of Multilinear Evolution. Urbana: University of Illinois Press.
Sunde, J., Sowman, M., Smith, H., & Wicomb, W. (2013). Emerging proposals for tenure governance in small-scale fisheries in South Africa. Land Tenure Journal, (1).
Temper, L. (2019). Blocking pipelines, unsettling environmental justice: from rights of nature to responsibility to territory. Local Environment 24(2):94–112.
Tengö, M., Brondizio, E. S., Elmqvist, T., Malmer, P. & Spierenburg, M. (2017). Connecting diverse knowledge systems for enhanced ecosystem governance: the multiple evidence base approach. Ambio 43, 579–591 (2014).
Thorburn, C. C. (2000). Changing customary marine resource management practice and institutions: the case of Sasi Lola in the Kei Islands, Indonesia. World Development, 28(8), 1461-1479.
Ulate, K., Alcoverro, T., Arthur, R., Aburto-Oropeza, O., Sánchez, C., & Huato-Soberanis, L. (2018). Conventional MPAs are not as effective as community co-managed areas in conserving top-down control in the Gulf of California. Biological Conservation, 228, 100-109.
UNESCO (2020) Marine heritage programme https://whc.unesco.org/en/marine-programme/ As accessed, 02.12.20).
UN General Assembly, United Nations Declaration on the Rights of IndigenousPeoples : resolution / adopted by the General Assembly, 2 October, A/RES/61/295,
available at: ⟨http://www.refworld.org/docid/471355a82.html⟩ (accessed 30 May 2018)
Veitayaki, J., Breckwoldt, A., Sigarua, T., Bulai, N., & Rokomate-Nakoro, A. (2016). Living from the sea: Culture and marine conservation in Fiji. iTaukei Trust Fund Board.
Vermeylen, S. (2019). Environmental justice and epistemic violence. Local Environment 24:89–93.

Von der Porten, S., Ota, Y., Cisneros-Montemayor, A., & Pictou, S. (2019). The Role of Indigenous Resurgence in Marine Conservation. Coastal Management, 47(6), 527-547.
Warren, D. M. (1996). Indigenous knowledge, biodiversity conservation and development. In: James, V. (Ed). Sustainable development in third world countries: Applied and theoretical perspectives, 81-88.
Whitesell, E. A., Schroeder, F. W., & Hardison, P. (2007). Protecting Washington's marine environments: Tribal perspectives. SeaDoc Society, 373-432.
Wood, P. B., & Rossiter, D. A. (2017). The politics of refusal: Aboriginal sovereignty and the Northern Gateway pipeline. *The Canadian Geographer/Le Géographe canadien*, *61*(2), 165-177.

Zmyvalova, E. A. (2018). Indigenous Peoples of the Russian North and Their Right to Traditional Fishing. International Journal on Minority and Group Rights, 25(1), 51–83. doi:10.1163/15718115-02501004

Muehlig-Hofmann,A. (2007). Traditional authority and community leadership: Key factors incommunity-based marine resource management and conservation. SPC Traditional Marine Resource Management and Knowledge Information Bulletin, 21, 31-44[c1] .http://coastfish.spc.int/News/Trad/26/Trad26.pdf

https://www.iucn.org/news/commission-environmental-economic-and-social-policy/201710/locally-managed-marine-areas-indigenous-and-community-conserved-oceans

https://link.springer.com/article/10.1007/s40152-020-00162-6?wt_mc=alerts.TOCjournals&utm_source=toc&utm_medium=email&utm_campaign=toc_40152_19_1

Polunin N. 1984. Do traditional reserves conserve? A view of Indonesia and New Guinea evidence. In: Ruddle K, Akimichi T, editors. Maritime institutions in the Western PaciÞc. Senri Ethnological Studies vol. 17. Osaka: National Museum of Ethnology.

Paredes, F., Flores, D., Figueroa, A., Gaymer, C.F. and Aburto, J.A., 2019. Science, capacity building and conservation knowledge: the empowerment of the local community for marine conservation in Rapa Nui. Aquatic Conservation: Marine and Freshwater Ecosystems, 29, pp.130-137.