



Enabling Indigenous innovations to re-centre social licence to operate in the Blue Economy

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ABSTRACT

Sustainable, inclusive and equitable development and expansion of the Blue Economy hinges on deliberative and responsible negotiations and an understanding of the distribution of benefits, resource ownership and risks within community and interest groups and Indigenous Peoples. In this review we examine questions of governance and mechanisms for Indigenous participation and inclusion in the distribution of economic benefits, and monitoring and managing environmental and cultural impacts of Blue Economy industries. We suggest a shift in practice of social licence to operate such that consent is granted by Indigenous groups based on their perspective of social licence at all stages of the project life-cycle and at each interface where new social and cultural risks and opportunities emerge. Such a shift in practice across the Blue Economy requires the consideration of multiple collaborative arrangements and a platform for Indigenous driven transformation in how Indigenous Peoples participate in Blue Economy sectors and in business agreements based on their particular historical, social, cultural and economic context and goals. Such as an arrangement centres on new competencies that includes adaptive capacities within the particular blue economic partnership governance systems.

1. Introduction

Ocean and coastal regions are increasingly viewed as the new ecological frontier to respond to environmental, resource and social challenges [1]. The rising interest in Blue Economy and Blue Growth concepts is generated by expanding economic opportunities and commercial interest across multiple sectors including aquaculture, renewable energy, transport, conservation, tourism, and fisheries [2]. Investment and participation by industry and non-government actors is shaping and influencing the development of new ocean economies [2–4]. Increasing economic activity in coastal areas and seas toward a Blue Economy creates opportunities and poses potential environmental and social risks and inequities, particularly relating to coastal communities and Indigenous societies. The growth generated by the Blue Economy, including local employment and social programs, can obscure the uneven participation and exposure to risks of community members, such as Indigenous Peoples and women [5,6]. This includes direct risks and impacts for Indigenous Territories, customary practices, cultural wellbeing and Indigenous Peoples' relationship to seas that are central

to identity [1,5,7]. The origins of Blue Economy discourse is based on sustainability and equity [8]. The sustainable, inclusive and equitable development and expansion of the Blue Economy hinges on deliberative and responsible negotiations in addition to an understanding of the distribution of benefits, resource ownership and risks within community and interest groups and Indigenous Peoples [1,8–10]. This work begins to address a gap in the literature of practical case examples where community groups have successfully created the conditions to negotiate equity and sustainability in the emerging Blue Economy.

Blue Growth presents opportunities for coastal and Indigenous communities, including in the form of partnerships and Indigenous enterprise [11,12]. Research has demonstrated that Blue Economy partnerships with Indigenous Peoples need to consider the effects on [1,3,5,10,13–16]:

- Formal access and harvesting rights;
- Access due to increased competition on marine resources and areas;
- Indigenous Peoples' capacity to access and manage resources; and

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- Indigenous institutions that are directly involved in negotiating investment outcomes.

In this review we attend to questions of equity within governance and mechanisms for Indigenous participation, inclusion and innovation in the distribution of economic benefits, and in monitoring and managing environmental and cultural impacts of Blue Economy industries.

1.1. Indigenous Peoples and the Blue Economy

The Blue Economy, as with other large-scale natural resource based commercial opportunities on Indigenous lands, currently operates against a legacy of industry resource extraction with limited regard of the rights and interests of Indigenous Peoples. Across industrialised countries, consultation, monitoring, and assessment processes for natural resource development projects continue to pay limited attention to Indigenous livelihoods, their rights, interests and intersectionality, with little consequence for industry [10,17–19]. Thus, government is often perceived to be an enabler of industry, expediting development approvals [20–23]. The social, political and economic marginalisation of Indigenous Peoples across genders and social groups from decision-making has established deep distrust in state and industry driven initiatives, and state policy and regulatory processes [10,14,15, 21,24–26].

Increasingly, Indigenous Peoples are organising and negotiating terms of access, resource use and benefit creation with private sector interests. Through negotiations, Indigenous Peoples are generating diverse measures of control and decision-making to secure the practice of their culture, manage their lands and resources, enable political and economic re-building, and to define their economic futures from the resources on their lands and waters [7,18,27–29]. The capacity to successfully negotiate advantageous conditions with the private sector differs significantly across groups [28].

Globally, Indigenous Peoples seek to be meaningfully engaged in decision-making and/or as partners and beneficiaries from resource development projects on their traditional lands (including coastal and marine areas). History and the experiences of Indigenous Peoples highlight three pathways to guide policy in consultation, planning, development and management of Blue Economy projects [7,16,30]:

- Recognition and acknowledgement of Indigenous Peoples' histories, cultures and pre-existing governance that includes rights, knowledge and interests;
- Meaningful participation in decision-making and governance processes; and
- Inclusive negotiation of the distribution of benefits, opportunities, and risks of decision processes and actions amongst interest groups and Indigenous Peoples.

The continued legal and judicial recognition and affirmation of Indigenous rights and interests in the seas and oceans entails a transformation of governance and decision-making arrangements and mechanisms [3,12,25,31–33]. Learnings of the processes and mechanisms of consultation, decision-making, management, compliance and compensation from other natural resource development industries offer rich ground to explore a Blue Economy paradigm shift in the assumptions and models of development, benefit sharing and sustainable growth [1].

Further work on pathways for equity and of social and cultural acceptability – predominantly understood as social licence to operate (SLO) that transforms assumptions of sustainability and growth to be inclusive of Indigenous worldviews and generational responsibilities – is a productive initiation and opening that this work engages with for the Blue Economy [16,34,35].

1.2. Approach

This review was undertaken with an Australian focus on the emerging Blue Economy with reference elsewhere. We undertook a literature review of Indigenous participation, opportunities and perspectives of risk in the Blue Economy, which included journal articles, grey literature and media articles. Our search of peer-reviewed material was conducted using Web of Knowledge and the following search terms: Indigenous or First Nation* or Maori and (i) aquaculture or fisheries, (ii) Blue Economy, (iii) marine economy, (iv) deep sea mining, (v) sand mining, (vi) oil and gas, (vii) renewable energy. Our search returned 144 results which were further categorised as social, environmental, economic or legal. We used a semi-structured approach to search for grey literature and media articles online based on broad web searches and following relevant links.

There were two parts to the literature review. The first involved a review of operational models, frameworks and approaches to understanding opportunities for Indigenous-led innovation and working with Indigenous perspectives of risk in the resource development and extraction sector (using search topics of aquaculture or fisheries, blue and/or marine economy, deep sea mining and oil and gas). We focused particularly on conceptual frameworks of social/cultural licence to operate and Indigenous-led agreement making.

The second part of the review was to select examples of positive partnerships between Indigenous groups and industry and government for three case studies across Australia, New Zealand and Canada, to provide practical insights relating to Indigenous-led agreement making and social licence to operate. Searches for these examples were limited to aquaculture and renewable energy projects because these sectors represent two emerging Blue Economy industries that will have increasing impact on Indigenous Peoples' relationships with their coastal lands and waters. Aquaculture and marine renewable energy development face the common limitation of access to marine space due to increasing and rapid competition over coastal ocean areas among stakeholders and interest groups [3,36]. Underlying a successful establishment and expansion of aquaculture and renewable energy projects is comprehensive marine spatial planning processes that are inclusive of coastal stakeholders, sectors and Indigenous groups [3,13,32].

2. Social licence to operate and recentering on Indigenous rights and interests in the Blue Economy

2.1. Indigenous Peoples as rights holders not stakeholders

Indigenous Peoples, as the first occupants of territories and estates, hold historic rights, interests and values that relate to their ancestral lands and waters. Indigenous Peoples in Australia, New Zealand, Canada and elsewhere hold rights, as custodians of their ancestral lands and under legislation, that give them particular decision-making and negotiating roles that are not afforded to others [7]. Consequently, Indigenous Peoples do not only have stakes in development within their territories, but rights to determine activities within them. Considering Indigenous Peoples as merely stakeholders does not recognise their millennial occupation and management of their ancestral lands and waters, their particular history of dispossession or their experiences as a result of the legacies of colonisation [15,37]. Indigenous Peoples seek to be engaged as custodians who have particular aspirations and responsibilities, and demand recognition of their continuing governance, knowledge and connections to their ancestral lands and waters [38].

Four key principles to be considered when investing with Indigenous Peoples beyond stakeholder approaches in Blue Economy and aquaculture projects are:

- Indigenous Peoples bring particular economic, conservation and socio-cultural knowledge and goals that are unique to their relationship to their ancestral lands. Indigenous perspectives and

knowledge can easily be lost under project capacity, operating and resource pressures affording more influential community groups greater input [7,22,38].

- Indigenous Peoples have a cultural, historical, and custodial relationship and responsibility to their ancestral lands, and to neighbouring groups, that requires appropriate and meaningful engagement beyond stakeholder approaches [38–40].
- Indigenous Peoples bring a unique perspective to partnership based on their existing governance, responsibilities and inter-generational obligations [7,38,40].
- Indigenous Peoples' governance and responsibilities situates their interests and rights beyond consultation – to participation in decision-making and iterative negotiations in determining acceptable risks that affect their relationship to their ancestral lands and waters [7,17,39].

In asserting their rights, Indigenous Peoples are establishing the conditions for Indigenous-centred processes to enable dialogue and meaningful engagement that are defined by their laws, values, culture, and knowledge [41].

2.2. Social licence to operate (SLO)

International policy frameworks for the Blue Economy have begun to draw on the concept of social licence to frame the relationship of consent between the private sector and social actors and to highlight the importance of open communication and meaningful engagement where community opposition exists [9,35]. While this concept is steeped in a long history of social acceptance and opposition within the mining sector, the term arose to facilitate approval by incorporating social risk concerns in mining operations [24]. The literature demonstrates that the understanding of social licence to operate (SLO) is changing through practice, is contested, and often not easily granted to commercial or governance regimes [9,22,42,43]. The evolving nature of SLO relates to a level of informality and negotiability that pertains to changing understandings, expectations and norms within particular circumstances [44].

In the context of increasing recognition of Indigenous rights and Indigenous Peoples' assertion of their rights and interests on resource extraction projects on their ancestral territories, and the expansion of Blue Economy projects on Indigenous Peoples territories, future Blue Economy agreements will be enacted in new social, ecological and political frontiers that will re-shape (and are already re-shaping) the concept of SLO. Indigenous people are re-centring the theoretical foundations for natural resource development planning, assessment, and monitoring practices for Indigenous-led processes and agency [30]. Indigenous-led processes enable a re-centring of the SLO concept and framework to place Indigenous Peoples centre-stage in building relationships directly with the private sector and in granting SLO on their terms [7,43]. This shift in focus of SLO attends to the modern scales, from local resource use interactions to global negotiations, where Indigenous Peoples seek to meaningfully work, thrive and operate across diverse partnerships [7,42,45].

Seen within both a historical and contemporary context with inter and cross-generational responsibilities, an Indigenous-centred SLO emerges under shifting arrangements in both formal and informal settings, and continuous negotiated informed consent under changing capabilities, access rights and resources. Social licence offers a flexible conceptual framework to explore ways in which meaningful dialogue, decisions and actions can be facilitated, regularly adapted and simultaneously applied by Indigenous groups to advance their goals through and with Blue Economy project partners. In granting SLO, Indigenous groups are defined as partners. We propose to reframe SLO in this direction, of Indigenous innovation in SLO where Indigenous groups are negotiating partners – a foundational condition to facilitate equity in the evolving sectors of the Blue Economy.

2.3. Shifting the focus of SLO through Indigenous innovations in partnerships

Indigenous Peoples seek to engage with industry as long-term decision-making partners in commercial ventures that can also generate opportunities for Indigenous enterprise. Indigenous partnerships entail the explicit intent of having authority to assess and manage impacts, evaluate management options, share in benefits and to limit costs [7,35,41,46]. This capacity comes by virtue of their historical rights to their traditional lands and waters, the long-term nature of projects and the potential effects of novel operations on their cultural resources, livelihoods and pursuit for self-determination [7,18,20].

The partnership approach places emphasis on relationships and meaningful consultation, negotiation and dialogue between Indigenous groups with industry and government as part of the ongoing use of resources and impacts on Indigenous values [18,20,40,47]. Indigenous values under a development context relate to [30,43]:

- ways that non-negotiables need to influence SLO in each group's circumstances, which reflect Indigenous geography, historical and social contexts, and align with their values, including relationships with nature and to other groups
- respect for Indigenous knowledge and capacity, to ensure authority in decision-making processes
- the use of Indigenous frameworks to conceptualise, assess and interpret impact assessments, and evaluate options
- processes for continual learning and mutual adaptation that improve the overall project outcomes
- outcomes and benefits as defined by communities

Engaging with community members and working with and acting on Indigenous knowledge throughout the project negotiation process has been demonstrated to be critical to supporting and enabling meaningful partnership with Indigenous nations [18,41,47]. Indigenous innovation in SLO is about Indigenous decision-making and agency that is enacted through governance [7,47,48].

O'Faircheallaigh [28] asserts that Indigenous political mobilisation is a key variable in determining positive outcomes for Indigenous Peoples from negotiated agreements for commercial development on their ancestral territories. Strong agreements can be established in contexts where there is limited legal recognition or mechanisms to negotiate [28]. Positive outcomes for Indigenous groups are possible when they can mobilise their networks and resources to negotiate effective contracts and agreements for social, economic, cultural and environmental outcomes [30,43]. Indigenous political mobilisation includes Indigenous agency and Indigenous-led processes that centre on Indigenous-directed assessment and decision making for community outcomes. Community ability to negotiate effectively and to protect its autonomy within a corporate model of operations is a key factor in strategic community action [18,49].

Indigenous values that connect people to place and support their sustained relationships across generations, while also being locationally specific and reflecting cultural, governance, and societal contexts, creates a setting for diverse and unique types of Indigenous-centred SLO [29,30,50]. The broad guiding values that relate to managing ancestral territories and resources in partnership with non-Indigenous actors at large scales include [7,30,31,51]:

Relatedness – the connectedness of people with the natural world and non-living entities that need to be considered in any novel project.

Reciprocity – which relates to the strengthening relationships between people, the natural world and non-living entities such that rights to resource use are inter-dependent with responsibilities to maintain, protect and honour those relationships.

Responsibility – responsibility for both Indigenous and non-Indigenous proponents is a form of accountability, where spaces are created for inclusive dialogue. Here, space includes consideration of

time to meet with communities to provide information and build capacity to understand and assess the components for informed decision-making across the phases of the project life cycle.

Respect – reciprocity is closely tied to respectful relationships between people, the natural environment (including species and sites), and non-living entities. Appropriate protocols, practices and policies ensure that respectful relationships are maintained across all subjects that centre in the Indigenous worldview. This includes working with Indigenous expertise and agreements, made with the authorised leaders, and protecting Indigenous Cultural Intellectual Property.

Relevance – to start with issues that are relevant to and honour Indigenous realities, connection to place and everyday experiences as important sources of knowledge.

Blue Economy projects have the potential to provide monetary and utilitarian benefits as well as strengthen the values and ethics that sustain Indigenous Peoples' relationship with their ancestral territories and other interest groups [31,32]. Indigenous institutions are central to enabling and enacting values that are held and assigned by groups, and will have a key role in guiding Blue Economy project partnerships [7, 30–32,51]. Indigenous institutions are asserting terms and conditions of engagement that are beginning to transform the relational landscape of resource development partnerships [41,47]. Consideration of formal legal mechanisms that influence and establish capacity and authority to negotiate are important in partnership agreements, as are the types of resource and capacity networks that Indigenous organisations can access to inform and guide their decisions [6,20,28,43]. Ruckstuhl, Thompson-Fawcett and Rae [7] identify four principles to help guide partnership arrangements that (non-Indigenous) industry and Indigenous groups can explore together. These are:

- The understanding and recognition of governance, ownership and interests on which meaningful dialogue, negotiation, decision-making is agreed to (and can change with mutual learning).
- Matters of stewardship that relate to protecting the environment, care of the customary lands, and limiting the effects of harm on the cultural landscape.
- Granting permission does not incur unexpected consequences that relate to customary rights and past grievances.
- Guarantee of benefits to traditional custodians (employment, education, capacity building, services).

Gibson, Hoogeveen, MacDonald and The Fire Group [41] highlight that Indigenous-led processes do not have to replace other models entirely but can adapt and shape particular qualities, and embed new processes that are in line with Indigenous values, principles and practices.

By drawing on scholarship that conceptualises Indigenous rights and interests for Indigenous-led planning and SLO we highlight possibilities and principles for an equitable and transformative Blue Economy. To illustrate these points, we provide case examples of where Indigenous Peoples are innovating through governance mechanism to broker partnerships, re-negotiate Free Prior and Informed Consent (FPIC) as part of the business model, and broaden sustainability for diverse outcomes.

3. A framework for Indigenous innovation in licence to operate

The literature demonstrates that multiple models and frameworks will enable and facilitate Indigenous innovations in licence to operate in the natural resource sector. A continuous process of project development that incorporates Free Prior Informed Consent (Box 1) and learning across its lifecycles mean that the relationship between Indigenous groups and industry is in continual evolution and is dynamic. We draw

Box 1

Free Prior and Informed Consent in Relationship Building.

The ongoing neglect of Indigenous Peoples' rights to, and laws relating to, their land and water resources has seen Indigenous Peoples continued advocacy for companies and governments to adopt the language of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and its principles of Free Prior and Informed Consent (FPIC) for any development proposal on Indigenous lands or territories [57,58]. FPIC is well-established in international human rights law. Large project risks can be reduced where FPIC has been developed and acquired through a mutual understanding of the constituents of consent for the rights holders [51,57]. While the UNDRIP is not legally binding on states, it has supported and is utilised by Indigenous Peoples to demand that companies negotiate any developments on their ancestral territories [47, 58]. Insisting on FPIC is based on the premise that Indigenous peoples are able to determine whether development occurs on their lands and the form it takes, if acquiesced [47].

Development proposals present both opportunities and risks that will impact Indigenous responsibilities, requiring collective decision-making to consider sacred and inter-generational obligations and responsibilities while balancing potential development impacts on customary lands and resources [47,51]. Achieving successful consultation and consent processes must therefore reflect rights holders' obligations and their continued succession.

The UN Office of the High Commissioner for Human Rights provides the following conditions for FPIC [59]:

Free, implies that there is no coercion, intimidation or manipulation; Prior, implies that consent is to be sought sufficiently in advance of any authorisation or commencement of activities and respect is shown to time requirements of Indigenous consultation/consensus processes; and Informed, implies that information is provided that covers a range of aspects, including the nature, size, pace, reversibility and scope of any proposed project or activity; the purpose of the project as well as its duration; locality and areas affected; a preliminary assessment of the likely economic, social, cultural and environmental impact, including potential risks. [59, p.2]

The granting of consent to access and develop resources on Indigenous lands is a foundational principle of Indigenous right to self-determination [57]. The connection of FPIC to rights of self-determination requires that Indigenous Peoples in each context define and control resource access practice and processes [47]. Mitchell, Arseneau, Thomas and Smith [57, p.17] define consent building as "being contingent upon relationship, respect, and mutual benefit derived through power sharing throughout the processes of consultation at any and all stages of development".

The literature demonstrates that Indigenous centred FPIC is based on relationship building. This includes relationships between non-Indigenous industry, government and individuals acknowledging the historical and customary responsibilities, and relationships that Indigenous Peoples have to their lands, as well as working together to negotiate through and with differences of view throughout each project lifecycle [47,51,58, 59].

on research on agreement-making with and by Indigenous groups to outline an approach to guide external actors to work with and support an Indigenous-centred social licence to operate – principles and practices that align with Indigenous values, ancestral rights and interests.

Multiple agreement pathways are conducive to resource development partnerships that will deliver the types of environmental, social, cultural and economic outcomes and futures aspired to by Indigenous groups. These can include [28,43]: informal resource-sharing arrangements; impact and benefit agreements; and business contracts with community organizations or corporations. As identified by O’Faircheallaigh [28] and Jolly and Thompson-Fawcett [30] such agreement pathways would be based on Indigenous-led models of organisation and innovation that provide [28]:

- avenues to access technical and financial advice;
- capacity and resources to support negotiations; and
- resources to develop strategies at regional levels to establish precedents and learnings across groups and agencies.

The Wyatt [43] framework (Table 1) has been developed with particular attention to Indigenous experiences in the natural resource industry and provides broad characteristics of the elements to obtain and maintain SLO and support Indigenous innovations in licence to operate. The framework can be applied to a variety of contexts and a range of partnership agreements in which Indigenous groups are engaged in negotiations to pursue their particular objectives and develop their capacity and practice for resource development agreements.

The framework consists of two main components called Path elements and Collaborative arrangements. Path elements contribute to obtaining and maintaining SLO. Wyatt [43] shows that no one Collaborative arrangement delivers significant contributions across all Path elements but that multiple arrangements can be mobilised to do so. The types of arrangements that contribute most effectively to SLO vary with the context, capacity and interests of the Indigenous group and the proponent.

Path elements:

- ‘Effects on socio-economic infrastructure’ can have both positive and negative impacts. Positive impacts include employment, training, business development and revenue sharing. Negative impacts can include new or increased tensions between groups and demands on social services. Note that the original terminology from Wyatt [43] was ‘impact’ but we use the term ‘effects’ here and for biophysical infrastructure to connote both positive and negative effects.
- ‘Effects on biophysical infrastructure and the environment’ are a central theme on which concerns are raised and opposition to a project can culminate, resulting in the loss of SLO. Companies that

established agreements beyond the minimum environmental regulation or showed how environmental impacts were reduced were more likely to obtain SLO.

- ‘Effective engagement processes’ relates to the quality of engagement including frequency of contact and procedural fairness, that is; the inclusion of Indigenous Peoples in decision-making and the types and models of governance that mobilised in an agreement.
- ‘Relationship building and trust’ is the fourth group of path elements that is established through the engagement processes and Indigenous Peoples establishing their expectations of a meaningful relationship with resource users and decision-makers.
- ‘Respecting and exercising rights’ recognises the rights and interests of Indigenous Peoples in relation to resource development and when this is strong it holds provisions for the involvement of Indigenous Peoples in decision-making.

The five collaborative arrangements are: (1) **Impact and benefit agreements (IBAs)** The negotiation of agreements with industry on terms of development on Indigenous lands is one route for Indigenous Peoples to protect their heritage [52]. Wyatt [43] defined Impact and Benefit Agreements (IBAs) as negotiated agreements between Aboriginal nations (or communities) and private companies, demonstrating that consultation has occurred and that the nation supports or accepts company plans to exploit certain resources in exchange for benefits such as employment, revenue sharing and impact mitigation. Agreements can address a variety of issues including Indigenous involvement in environmental management of a resource extraction area, employment initiatives as well as on-going cultural heritage protection and management [28]. Fidler [53] and O’Faircheallaigh [52] note that IBA and benefit agreements deliver variable outcomes for Indigenous Peoples where company policies and practices offer varying cultural heritage provisions. Agreements with successful outcomes deliver economic and social benefits, strengthen Indigenous participation in environmental management and bolster formal protection of cultural heritage [28]. The capacity for negotiation and agreement-making within Indigenous groups are critical if Indigenous Peoples are to achieve successful outcomes that address structural disadvantages and resolve divergent interests with industry and government [52].

(2) **Co-management** Indigenous groups and nations are increasingly entering into co-management arrangements with governments and the public sector in managing their ancestral lands or to undertake specific activities. Co-management is a formal agreement to share responsibility in decision-making and accountability between local resource users, government and others [54]. As with IBAs, co-management can deliver mixed results for Indigenous Peoples where priorities and processes don’t align with Indigenous interests and goals.

Indigenous community-based monitoring that is part of a co-management agreement can reduce the impacts of resource extraction by industry post-approval, provide early response, and ensure

Table 1

Pathways to obtaining SLO from Indigenous Peoples, adapted from Wyatt [43] (detailed descriptions are omitted from this version of the original table and instead are provided in the associated text). SLO outcomes can be obtained through contributions of each type of collaborative arrangement. The efficacy of each arrangement in enabling each element of SLO is identified on a scale of ‘weak’ to ‘significant’.

Path elements	Examples of Collaborative arrangements				
	Negotiated impact benefit agreements	Co-management	Consultation processes	Government tenure	Economic Partnerships
Effects on socio-economic infrastructure	Medium-Significant	Weak	Weak-medium	Medium	Significant
Effects on biophysical infrastructure*	Medium-Significant	Medium-significant	Medium-significant	Weak	Weak-Medium
Effective engagement processes	Weak-Significant	Significant	Weak-significant	Weak	Weak-Medium
Relationship building	Medium-Significant	Medium-significant	Medium-significant	Medium	Significant
Respecting, protecting and exercising rights	Uncertain	Medium-significant	Medium	Weak	Weak

* Terminology from Wyatt [43] refers to management/resilience of wildlife and plant populations.

Indigenous communities are monitoring key concerns and threats from industry activity [41,55]. It can also provide opportunities for local employment, provide greater coverage/penetration of sampled areas and help ensure guaranteed access to areas. Responsive actions to comply with environmental regulations and agreement requirements is a necessary partner to monitoring [41].

(3) Consultation processes A diversity of consultation processes has been established between private companies and Indigenous groups across a variety of resource extraction contexts with highly variable outcomes [14,20,21]. Most commonly raised is the quality and appropriateness of consultation, effectiveness of consultation and the quality of Free Prior and Informed Consent [47] (Box 1). While legislation states terms of consultation, such as a duty to consult with Indigenous People and rights to negotiate, Indigenous People have specific requirements for meaningful consultation practices such as the inclusion of Indigenous values [21,30,47,56]. Establishing common understanding on the type and quality of consultation practices is key to improving relationship building outcomes with private and government actors [20]. Securing rights and inclusive processes require additional mechanisms.

(4) Government-issued tenures, rights and licences Government allocation of tenures or quotas (e.g. licences and permits that grant harvesting rights and management responsibilities) to Indigenous groups is one significant pathway of government recognising and supporting Indigenous Peoples to exercise their rights (e.g. Torres Strait and Blue Mud Bay in Australia). These, however, have largely been adapted from non-Indigenous industry where Indigenous Peoples do not have the expertise or the same interests to utilise the tenure to its full economic potential. Tenures may enable new employment and training opportunities, designed largely by and for non-Indigenous commercial practices and values, with uncertain long-term sustainability [28,43]. Tenure ownership can set the conditions for more effective negotiations with companies, such as management, monitoring and practices that align with Indigenous values, but alone does not ensure successful outcomes for Indigenous Peoples [28].

(5) Economic partnerships/contractual arrangements Economic partnerships between Indigenous corporations and industry can take many forms that require a range of expertise and infrastructure investment (e.g. a labour hire company for particular operations). The main cited benefits relate to revenue and employment of Traditional custodians on their ancestral lands, capacity building and sustaining culture and language [43]. Economic partnerships often favour industry, with economic benefits falling largely with industry. Where Indigenous groups are well connected and can mobilise political and economic networks, they are more likely to generate positive outcomes for themselves [28]. Challenges can arise when non-economic benefits, such as culture and language revival, as defined by each group, are not appropriately included in the contractual arrangement [18]. The success of economic partnerships for Indigenous Peoples varies with the type of governance and the arrangement negotiated between industry and the Indigenous group.

3.1. Case study assessment through a framework lens

The framework utilised in this review focuses on the multiple path elements and collaborative arrangements that need to be considered in obtaining SLO to meet the multiple and diverse goals that Indigenous groups may seek. Each type of collaborative arrangement and agreement provides conditions within which Indigenous-led practices can be strengthened. The framework provided in this review can guide dialogue between industry and Indigenous groups to explore pathways to advance Indigenous aspirations and sustainable resource development partnerships.

4. Blue Economy case studies

The case studies selected for this review focus on former colonial

territories (Australia, New Zealand and Canada), each a settler country with Indigenous Peoples who continue to advocate for their rights to their ancestral lands and waters. The formal rights of Aboriginal and Torres Strait Islanders, Māori, and Aboriginal Peoples in Canada (First Nations, Inuit and Métis) in their marine territories continue to be debated, defended and negotiated through each national government's legislative framework. Fig. 1 lays out the implementation timeline for key pieces of legislation that relate particularly to aquaculture and marine renewable energy in each nation. The legal regimes that support Indigenous involvement in the aquaculture and renewable energy sectors of the Blue Economy through Indigenous entitlement to marine resources and infrastructure vary significantly across Australia, Canada and New Zealand [3,60]. In New Zealand, the Marine and Coastal Area (Takutai Moana) Act 2011 (MACA) established a 'no-ownership' principle, meaning that Māori customary rights are non-exclusive. Over the past decades the Canadian and New Zealand governments have developed policy regimes to support types of economies and create mechanisms to promote Indigenous cultural and economic development opportunities [61]. In Australia, the Native Title Act 1993 recognises some interests of Indigenous Peoples that have survived colonial acquisition of titles [3]. Across the three nations, Indigenous Peoples view the land and the sea – and the knowledge and sacred sites associated with them – as one entity to be protected and managed as a whole [3,60]. Future opportunities for commercial projects with Indigenous Peoples will relate to pre-existing rights and custodianship that connect lands and sea [3].

The implications of marine renewable energy for Indigenous and local communities were reviewed by Kerr, Colton, Johnson and Wright [3] in 2015. We synthesise and update findings from this previous review in the [Supplementary Material](#), noting that marine renewable energy partnerships with Indigenous communities in Australia, New Zealand and Canada are still nascent. The sections below focus on case studies for aquaculture.

4.1. Australia

In Australia, Aboriginal and Torres Strait Islander Peoples navigate both federal and relevant state and territory legislative powers and regulations to exercise their rights and interests in the marine environment. The Australian maritime regulatory environment is complex, involving diverse authorities and institutions from national to local levels. Blue Economy projects with Indigenous Peoples are therefore consented under multiple layers of legislative frameworks.

The earliest form of western legal recognition of Aboriginal Peoples' rights and interests on their ancestral lands in Australia was the passage of the Aboriginal Land Rights (Northern Territory) Act 1976. This predates the federal Native Title Act and model of recognising Indigenous rights and interests. The Aboriginal Land Rights Act 1976 (ALRA) recognises Aboriginal peoples as legal owners of their ancestral lands and granted Aboriginal landowners the right to deny mining and exploration companies permission on their ancestral lands if appropriate measures of cultural heritage protection are not agreed [62]. The ALRA Act 1976 places Aboriginal landowners in a strong position to negotiate with resource companies. While Aboriginal ownership of land and intertidal and coastal zones are extensive (e.g. in the Northern Territory [3,60]), unfortunately, the powers provided for under the ALRA did not include inland and marine waters. This is at odds with the desires of the Aboriginal and Torres Strait Islander Peoples for whom the legal and cultural heritage distinction made between land and sea is foreign and artificial [3,63,64]. The term 'Country' relates to land, rivers and sea, the sites, places and customary laws associated with them, as a single entity [63,65]. The laws and obligations that relate to Country are linked to ancestors and future generations and socio-cultural connections across custodian groups in the landscape.

The passage of the 1993 Native Title Act in the Australian common law recognised the rights and interests of Aboriginal and Torres Strait

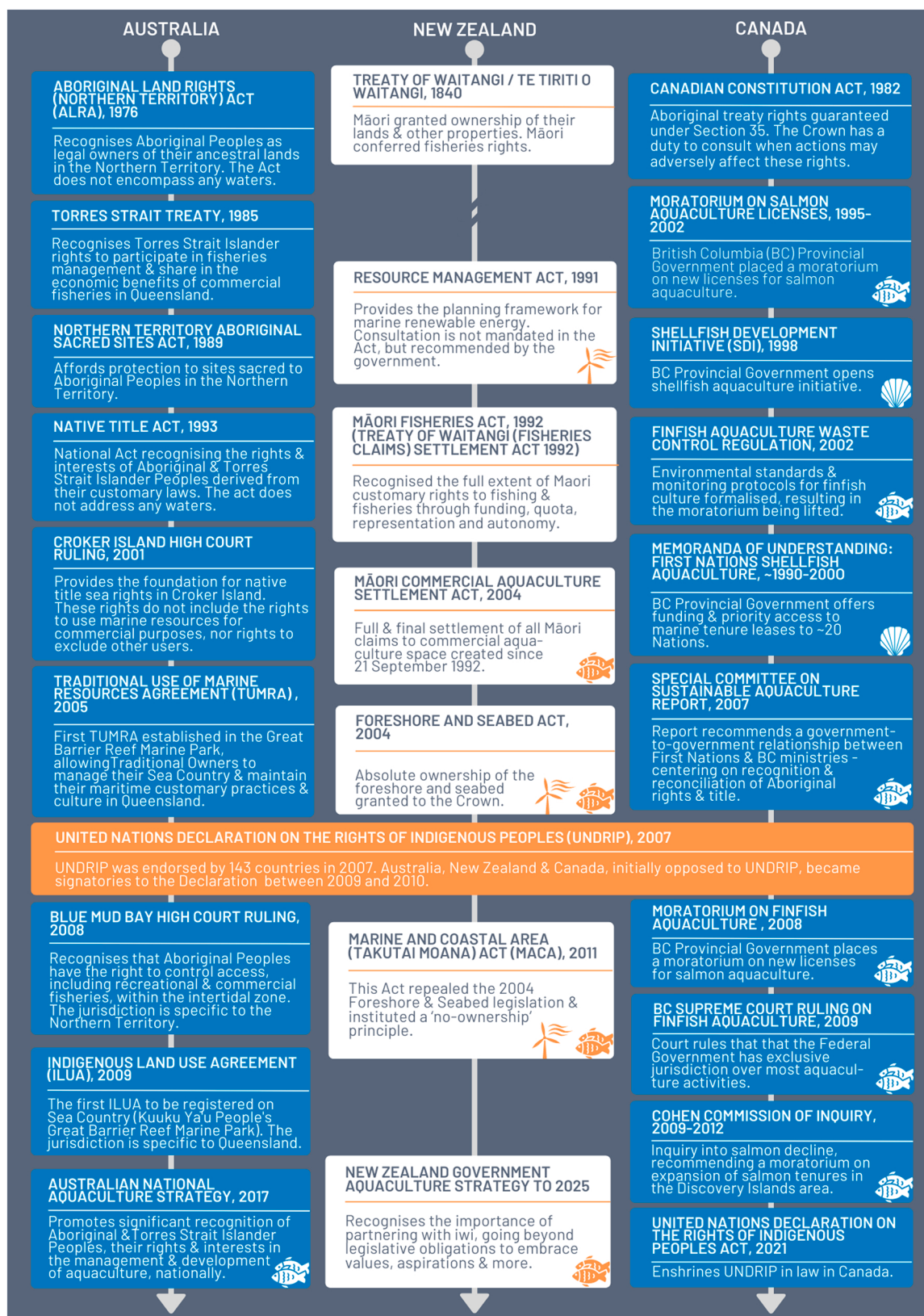


Fig. 1. Legislative frameworks pertaining to the development of the Blue Economy, and Indigenous innovation in social licence to operate, in Australia, New Zealand and Canada. The timeline relates to key developments relevant to finfish aquaculture (fish icon), shellfish aquaculture (shell icon), renewable energy (wind turbine icon) and the Blue Economy as a whole (no icon). The United Nations Declaration on the Rights of Indigenous Peoples, a cross-cutting international framework, is also highlighted.

Islander Peoples derived from their customary laws [66]. The federal statutory legislation gives statutory recognition to native title that includes fishing, hunting and gathering rights for the purposes of meeting personal, non-commercial needs of the native title holders. Native title, however, was not addressed in water and marine resource law until 2000 [67]. Native title holders do not have the right to exclude commercial or recreational fishers from their Sea Country.

The 2008 Blue Mud Bay High Court ruling recognised that landowners held rights of exclusive possession of tidal waters that overlay the Aboriginal lands (held under ALRA) as well as the adjoining land. Aboriginal Peoples have the right to control access, including recreational and commercial fishers, within the inter-tidal zone. Approximately 80% of the Northern Territory (NT) inter-tidal waters is owned and controlled by Aboriginal Peoples [64]. Aboriginal coastal licences (NT) recognise Indigenous rights to commercial fisheries, in a limited fashion, under a licence category that allows Indigenous Peoples to establish small-scale seafood enterprises [64]. The first landmark native title recognition of Indigenous commercial fishing rights in 2013 occurred in a large sea claim in the Torres Strait where native title included the taking of fish for trading or commercial purposes [68]. This was the first recognition of Indigenous Peoples' rights and interests to participate in modern economies [68].

The negotiation of agreements and provisions to protect cultural heritage to recognise on-going Indigenous interests and rights on land and Sea Country occurs in an environment where Aboriginal and Torres Strait Islanders are pursuing non-economic (social, cultural, environmental) such as strengthening connection to Sea Country, and economic goals such as youth employment [52,61,64,68]. Indigenous Australians seek recognition of their pre-existing rights "associated with and based on the prior and continuing occupation of Country and water and activities (e.g., fishing, gathering) associated with the use and management of these" (Fisheries Research and Development Corporation, 2012, p. 1) [69].

However, Indigenous coastal dwelling communities in Australia seek to engage in culturally aligned marine enterprises as one pathway for economic independence and self-determination [61,69]. These economic development opportunities would be sourced from their cultural marine assets and their associated rights to access them to engage "in economic activity based on the use of traditional aquatic biological resources and/or the right to share in the benefits derived from the exploitation of aquatic biological resources" (Fisheries Research and Development Corporation, 2012, p. 2) [69]. Uncertainty generated by the native title process and claims over Land and Sea Country has weakened the negotiating capacity of Aboriginal groups to engage in aquaculture joint ventures however the motivation to engage in the business sector is a key enabler, particularly in Northern Australia [61,66,70]. Traditional Owners in the Northern Territory, where landowners have tenure over 80% of the coastline to the low water mark, are strongly positioned to have a significant role in development of an aquaculture sector [70]. Similarly, the opportunities provided to island and remote communities by renewable energy, which could make these communities energy self-sufficient but also create additional commercial or cultural opportunities (along the lines of what is seen in Shetland in the UK or King Island in Bass Strait) could be substantial for Aboriginal and Torres Strait Islander communities if economic joint ventures were possible.

The Australian National Aquaculture Strategy [71] promotes greater recognition of Aboriginal and Torres Strait Islander Peoples rights and interests in the management and development of aquaculture. A recent exemplar of an aquaculture joint venture involves Wanna Mar Stehr in South Australia (Table 2). This is the first commercial aquaculture joint venture with an Indigenous corporation in Australia. It was established in 2020 between Wanna Mar Produce Pty Ltd, a South Australia based Aboriginal owned commercial fishing Corporation, and the Stehr Group Pty Ltd one of Australia's largest Southern Bluefin Tuna producers in the far west coast of South Australia [72]. Wanna Mar Produce Pty Ltd

secured \$3.5 million from the Indigenous Land and Sea Corporation to purchase a 25 tonne/year Southern blue fish tuna quota with the backing of Far West Coast Investments [73]. Far West Coast Investments is an organisation that represents the interests of native title holders, particularly Sea Country People in the region [74]. The Stehr Group matched the 25 tonne/year quota in the joint venture of Wanna Mar Stehr [73,74]. The joint venture enables Wanna Mar fishermen to catch and grow their tuna under the supervision of Stehr Group staff and to market their 25 tonnes of Southern Bluefin tuna quota with Stehr Group [74]. The business plans to launch a new brand based on the joint venture that highlights the model of inclusive and active Traditional Owner participation in the Southern Bluefin Tuna industry.

A partnership between Wanna Mar Stehr Pty Ltd and other Indigenous seafood business enterprises in the region will enable Indigenous Sea Country people to develop careers in the industry through training experience across multiple roles [73,75]. The long-term aspirations of the joint venture is to ensure Indigenous employment and management at every stage of the Bluefin Tuna production systems [73]. The joint venture illustrates a partnership model that enables Traditional Owners to develop skills that align with customary economies, that express their long-term aspiration for self-determination and be on Country undertaking a variety of roles and continuous negotiation of roles and outcomes throughout the joint venture. The case is an exemplar of Indigenous and non-Indigenous partnership based on historical and customary connections to place, Indigenous and non-Indigenous innovations to create a mutually beneficial business model that includes capacity building to establish an Indigenous driven seafood production line and the strategic mobilisation of Indigenous networks to secure capital for the joint venture. The joint venture enables skill and capacity development in a variety of roles for the Indigenous groups in the region that is central to mobilising the cultural drivers for the Traditional Owners to set their direction for economic development.

South Australia is also home to another positive example of how powerfully Aboriginal and Torres Strait Islanders can contribute to and benefit from involvement in aquaculture. The Narungga Nation Aboriginal Corporation (NNAC) is the first entity to receive a marine algae aquaculture lease and license in South Australia (Table 2), marking the emergence of a new South Australia aquaculture industry [76]. NNAC was granted two production leases and licences for 10 and 30 ha within inter-tidal aquaculture zones. The lease and licence were negotiated under the Buthera Agreement (2018) [77] with the State of South Australia to deliver economic, social and cultural outcomes for the NNAC members. The Buthera Agreement was part of a process designed by the South Australia Government to establish a Treaty with NNAC. Outcomes established in the Buthera Agreement include [77]:

- Narungga People participation in the aquaculture industry.
- Narungga Nation capacity building through creation of economic opportunities.
- Narungga community development that includes employment and capacity building.
- Narungga participation in fisheries management to secure ecological sustainable development.
- Career pathways for Narungga People in the aquaculture and fisheries sector.

NNAC signed a partnership agreement with CH4 Global, an international company that farms seaweed to reduce greenhouse emission in the livestock industry, to cultivate seaweed in the NNAC marine leases [78]. CH4 Global purchased a licence for the patent of the commercial production of the red seaweed *Asparagopsis*, which it will grow with NNAC. The project is in testing phase and is designed to establish a commercial supply production of seaweed to sell in Australia [79].

Two other important collaborative arrangements, co-management and government tenure (see Table 1 above) were negotiated under the Buthera Agreement. The Buthera Agreement includes co-management of

Table 2

The relationship of leverages (L), challenges (C) and opportunities (O) described for Australia (Wanna Mar and NNAC case studies, through media sources), New Zealand (Whakatohea/O'po'tiki in the Eastern Bay of Plenty [80]) and Canada (west coast aquaculture development) to the Wyatt [43] path elements for obtaining SLO.

Path elements	Economic partnership: Leverages, challenges and opportunities		
	Australia	New Zealand	Canada
Impacts on socio-economic infrastructure	Formal agreements with partners, including private sector and government that incorporates investment in infrastructure, industry expertise, and capacity building in all phases from decision-making, testing, production, catching, processing, marketing and established supply chains[78,79]. (L) Innovative partnerships that utilise government support, industry expertise, Indigenous leadership and formal tenure/property rights including quotas, marine lease and licence to establish commercial ventures[73]. (L) Formal training through industry specific micro-credentials designed by broader community and partnerships to create careers for Indigenous Peoples [73]. (L) Employment opportunities for Indigenous Peoples from the region in all aspects of the value and supply chain in the Indigenous-owned facilities and by Indigenous businesses (CH4 2020, Spence 2020, Neindorf 2021). (O) Common vision among partners of a renewal of the industry, joint branding and Indigenous-led economic and social development[76–78]. (O)	Securing enough investment (government and private) in a timely manner to enact sustainable and researched development opportunities[80]. (C)	There is direct competition for space and resources between aquaculture development, and commercial and subsistence harvesting by First Nations[81–83]. (C) Risks associated with cultural heritage exit as reduced access to wild fishing reduces opportunities to share this cultural practice with successive generations[84]. (C) There is tension between collective ownership, valued by First Nations, and private ownership associated with aquaculture leases[85]. (C) Consolidation of licences by private companies restricts economic opportunities available to First Nations, with negative consequences for community wellbeing[84]. (C) Economic benefits can be realised if aquaculture ownership and decision making is retained within the community[81]. (L)
Impacts on biophysical infrastructure	No mention of industry impacts on the immediate biophysical environment other than the potential impacts of climate change on the blue fin tuna industry's future practices and fisheries management in the sector for sustainable ecological development (Government of South Australia 2018, Spence 2020, Neindorf 2021). (O) Positive impact of algae aquaculture on climate change emissions in agriculture (Norwood 2021) (O) Aspirations to invest in ranger programs as one of multiple careers paths for the youth[73,74]. (O)	The enhancement of an ecosystem resulting from the introduction of additional marine life (oysters, seaweed, sponges, surf clams, fish stocks and new species). This can cultivate vertical integration of complementary businesses and opportunities[80]. (O)	There is direct competition between aquaculture sites and critical fish habitat[85]. (C) Depending on the type of aquaculture development, water quality could improve (shellfish)[85] or decline (salmon) [85]. (O/C) Possible loss of genetic diversity, disease, parasites, impacts of exotic species, impacts on co-habiting species and localised sediment impacts could occur[81,85]. (C) Biophysical risks can be mitigated by siting development in locations set by First Nations[81] and by directly engaging First Nations in their monitoring and management. (L)
Effective engagement processes	Long-term negotiations and relationship building by all partners, including capital raising (funds, leases, licenses, patents) to establish joint agreements[73,74]. (L)	Legislation and policies that purport a one-size- fits-all approach for pre- and post-treaty settlement entities at the same time responding to the needs of commercial and recreational users while balancing competing priorities and the economy[80]. (C)	Poor engagement generates a significant risk to business development[86,87], especially lack of engagement at an early stage[84]. (C) Meaningful engagement processes from the outset can support relationship building, facilitating the protection of Indigenous rights and the process of self-determination [84]. (O) Participatory processes that recognise local values and enable local decision-making can facilitate aquaculture activities that complement, rather than conflict with, wild harvesting[82]. (O)
Relationship building	Partnerships based on long-term negotiations and creation of common vision that include social, cultural and economic transformation[88]. (L) Traditional Owners have a key role in developing the future of the industry through business partnerships and aligned training and education programs[73,75]. (O)	Understanding how others are doing things and how this feeds into what is happening in Whakatohea/O'po'tiki e.g., who owns the genetics of species/ marine stocks as Ma'ori were guaranteed te tino rangatiratanga or undisturbed right to their lands, villages and all property that Ma'ori treasured according to Te Tiriti o Waitangi[80]. (C)	Government policies have historically led to a loss of access to resources and, consequently, generalised distrust of government among First Nations[85], impeding relationship-building. (C) Partnership, direct negotiation and a willingness to shift existing power balances (for example, around where development is sited and how monitoring is conducted) can build trust between First Nations and other groups [32]. (O) The existence of direct agreements between First Nations and aquaculture firms from the outset of any future development can help to build relationships and move towards Indigenous centred SLO. (O)
Respecting, protecting and exercising rights	Common vision of transformation of an industry with social, economic and cultural outcomes based on meaningful participation of Traditional Owners and Indigenous Peoples in the region and for current and future generations[74]. (L) Agreement-making with Traditional Owners is critical to the joint ventures (for example, The Buthera Agreement 2018 for NNAC). (L) Indigenous partners negotiations centred on established 'community' aspirations and exercise of customary rights (CH4 2020, Spence 2020, Norwood 2021. (L)	Development of an iwi coastal strategy inclusive of kawa, tikanga and traditional/ customary practices to sustain a marine ecosystem above and below the sea[80]. (L)	Risks to culture and territorial sovereignty, particularly in the context of unresolved land claims, are among the primary objections to aquaculture development[82]. (C) First Nations are concerned that their right to access marine resources is curtailed by aquaculture development [84], especially so in instances where leases for aquaculture are transferred outside of the community[82]. (C) There are opportunities to uphold indigenous rights at all stages of the process, from the planning process through to exit from the industry – including decisions around whether to develop, where to develop and how to monitor, mitigate and manage the impacts of development[82,87]. (O)

Innes National Park, re-named Dhillba Guuranda-Innes National Park under a co-management agreement in 2020, and the second is the participation of Narungga People in Fisheries management. The Narungga Nation Traditional Fishing Agreement established in February 2021, formalises the inclusion of Aboriginal knowledge in the management of fisheries in Narungga traditional waters. This business partnership between NNAC and CH4 sits within a larger goal of sustainable futures for Narungga People on their ancestral lands that includes their involvement in natural resource management decision-making.

The NNAC and CH4 partnership presents a unique opportunity in an emerging aquaculture sector where each partner is contributing a different type of capital, where the NNAC Peoples are involved from testing through to scaling up of production processes. The opportunities for capacity building and developing a practice with a non-Indigenous business within an emerging industry can be significant and pioneering for Indigenous business partnerships in Australia.

4.2. New Zealand

Indigenous social licence in Aotearoa New Zealand has its roots in the 1840 Treaty of Waitangi [7], which recognised Māori land rights and included fisheries. The development of subsequent legislation that has enabled Māori rights and claims in the marine space, particularly in relation to the aquaculture and renewable energy elements of New Zealand's Blue Economy, is summarised in Fig. 1. Recognition of Indigenous ownership and sovereignty interests stemming from the Treaty of Waitangi and enacted through more recent legislation is associated with an expectation of meaningful contribution to legal and ongoing operational processes [7], including long-term co-management and performance monitoring. Ruckstuhl, Thompson-Fawcett and Rae [7] indicate that this differs from the impacts and benefits agreements that have been negotiated elsewhere – particularly in Canada and Australia – between extractive companies and Indigenous groups to facilitate community development [89]. Although the latter are usually negotiated without a government presence, in New Zealand, the Treaty foundation for any negotiation is predicated on partnership with government (the Crown).

Māori have a significant presence in the New Zealand aquaculture industry, and this is anticipated to increase in the future as the requirements to allocate aquaculture space through the Māori Commercial Aquaculture Claims Settlement Act 2004 (Fig. 1) are met (at the time of writing one of the largest proposed offshore aquaculture initiatives in the very south of New Zealand is *iwi*). This Act obliged the Crown to provide *iwi* (confederation of tribes), before 2014, with the equivalent of 20% of existing aquaculture space (called "pre-commencement space") created between 1992 and 2004. That equivalent could take the form of a percentage of new aquaculture space, marine farming permits purchased by the Crown for the purpose, or the financial equivalent value. In 2008, *iwi* Māori and the Crown reached an early agreement on the third of these options, with a settlement of \$97 million made to Māori [90]. The 2004 Settlement Act also provides *iwi* with 20% of all new aquaculture space created from 1 January 2005.

In 2019, the New Zealand Government released a strategy for developing aquaculture in New Zealand, which recognises the importance of partnering with *iwi* to ensure their values and aspiration – commercially, culturally and as *kaitiaki* (guardians) – are provided for [91]. This means going beyond legislative obligations and embracing true partnership. Despite some ongoing controversy over aquaculture expansion and *iwi* interest in some regions (such as in the Marlborough Sounds), the New Zealand experience underscores the interdependency between growing a sustainable aquaculture industry and the need to recognise and accommodate existing Indigenous rights and interests in the coastal zone. This has involved political compromise to integrate and harmonise goals for aquaculture reform and expansion with the broader objective of forging a durable and certain accommodation of Māori

interests in the coastal zone.

An illustrative example of an aquaculture enterprise centred on partnership in New Zealand, is from the Eastern Bay of Plenty [80], focused on the rohe (*iwi* territory) of Whakatōhea/O^hpo^htiki. Eastern Sea Farms holds consent for a 3800 hectare marine farm located 8.5 kilometres offshore from Ōpōtiki township. Commercial mussel farming by Whakatōhea Mussels (Ōpōtiki) Limited and four other companies began in October 2014. There are lines in the water for spat catching and on-growing to harvestable mussels. The consent also allows other species to be farmed. To facilitate onshore servicing and seafood processing facilities in Ōpōtiki, the Opoitiki Harbour Development Project is currently underway, supported by local council and *iwi*.

The entities considered by Wiremu [80] in their analysis of partnership activities related to aquaculture in this region are:

- The Whakatōhea Māori Trust Board and Whakatōhea Aquaculture (Ōpōtiki) Limited (both shareholders of Eastern Sea Farms Limited);
- Whakatōhea Mussels (Ōpōtiki) Limited (80% lessee of the study area);
- The Whakatōhea Fisheries Trust;
- Whakatōhea Fisheries Asset Holding Company Limited; and
- Pakihi Trading Company Limited (PT).

Wiremu [80] describes the ownership relationships amongst these entities, together with policy and legislation that have enabled the development of a Māori marine economy in this region, and the challenges, leverages and opportunities that have arisen through the course of this development. These findings are summarised in Table 2 in the context of the Wyatt [43] pathways to obtaining SLO.

4.3. Canada

The Constitution Act, 1982 (Section 35) lays the legal groundwork for Indigenous social licence in Canada. The Act recognizes and affirms existing Aboriginal and treaty rights, including those associated with existing land claims agreements (which may pertain to marine as well as terrestrial space), and those that may be so acquired. In recent decades, legal interpretations provided by Canada's Supreme Court have clarified the rights of Aboriginal Peoples in Canada (First Nations, Inuit and Métis) – particularly relating to 'the duty to consult and accommodate' stipulated in the Act [43]. This means that the government (federal and provincial) has a duty to consult Indigenous Peoples for any activity that may adversely affect these rights, and take steps to avoid or mitigate impacts in order to accommodate the concerns of Indigenous Peoples. However, many treaty negotiations are ongoing and while the duty to consult is readily activated, there is no requirement for Indigenous Peoples in Canada to consent before development proceeds if their title rights are not enshrined in law [43]. Despite this, there is increasing momentum for change, and willingness to co-manage and form government-to-government relationships that go beyond the requirements outlined in the Act. One of the most recent developments is the 2021 United Nations Declaration on the Rights of Indigenous Peoples Act, which enshrines UNDRIP in Law in Canada [92]. In practice, the responsibility of the government to consult is often delegated to others, including to industry groups and consultancies, who may or may not have strong relationships with Indigenous Peoples. The depth and extent to which Indigenous Peoples are meaningfully engaged with during development – whether through co-management, consultation, business agreements or otherwise – is highly variable and there is significant scope for this process to improve [43]. Here we draw on insights from Canadian case studies relevant to the Blue Economy and highlight challenges and opportunities around ensuring Indigenous centred social licence to operate in Canada.

While Canada's share of the global aquaculture market is small (0.2%, [93]), the country is a major producer of farmed salmon [86,94] and the production of shellfish mariculture is growing [82,94]. The

majority of this activity is concentrated on the west coast, in British Columbia [95], though aquaculture also takes place on the east coast, including in Nova Scotia [96], New Brunswick [97,98], Newfoundland and Labrador [99], and Prince Edward Island [100]. Provincial and federal policies relating to aquaculture highlight the economic opportunities associated with growth in the sector and, largely, set targets for increased production [86]. However, such plans frequently face opposition at the local level, among the remote and rural communities directly affected by development, emphasising the need for social licence to operate in this industry. Public perception and awareness of aquaculture varies depending on the species produced, with salmon production facing fierce opposition from many groups and shellfish production generally being viewed positively, or being less well-known [86]. Perceptions of the risks and benefits of these aquaculture activities in an Indigenous context are described in the case studies below.

The majority of Canadian salmon production occurs in British Columbia (BC) [95] where its development has been a longstanding source of controversy [101]. Historically, the engagement of First Nations in aquaculture development in BC has been lacking. This has generated significant concern among First Nations, particularly in remote communities [95] who are often most affected by this activity owing to the siting of aquaculture developments.

BC's salmon aquaculture industry started in the 1970 s, when many operations were small-scale and centred on farming of local species [87]. Over time, production shifted to Atlantic salmon and ownership of aquaculture sites were increasingly consolidated (from around 100 to less than 20 companies over the period 1988–1996) [87,95]. In response to increasing concern, particularly from First Nations regarding the waste generated by open-net salmon pens, the BC provincial government placed a moratorium on new licenses to allow for a review of the social and environmental impacts of salmon aquaculture to be undertaken [86,87]. The review recommended the development of performance-based waste management standards, later formalised in the Finfish Aquaculture Waste Control Regulation [87]. The review also highlighted salmon farming as being a safe and environmentally responsible industry [86] and, following the introduction of the Finfish Aquaculture Waste Control Regulation, the moratorium was lifted.

The salmon farming industry in BC has since seen multiple moratoria,¹ each followed by an impact assessment (social and/or environmental) and change to the way the industry is regulated, each time regulations being more stringent. At the time of writing, open-net pen salmon aquaculture is being phased out in the province, given the concerns and risks associated with this form of aquaculture, its impact on First Nations, on wild salmon and the wider ecosystem. In this case, Indigenous centred SLO was not sought at the outset of development, nor the decades that followed. However, recent partnerships between Indigenous rights holders and a broad set of stakeholders in industry and government has led to an Indigenous-led phase out of salmon farming in areas such as the Broughton Archipelago. The leverages, challenges and opportunities relating to SLO for salmon aquaculture are highlighted in Table 2.

The shellfish industry in British Columbia (BC), Canada, presents a case study of a transition from a primarily common property wild fishery to a tenure-based system for aquaculture [85] (Table 2). Debates over private property rights and their implications are relevant beyond aquaculture – and can be applied to broad sectors of the Blue Economy. Here we draw on learnings from shellfish aquaculture around the coasts of Vancouver Island, where the industry is concentrated in the province.

First Nations have managed and harvested shellfish since time immemorial [102] and the wild harvest of intertidal shellfish remains an important part of Indigenous culture and food security. In 1998, the BC Provincial Government launched the Shellfish Development Initiative,

stimulating growth in aquaculture tenures and highlighting opportunities to increase the value of Canada's shellfish aquaculture sector [83, 103]. First Nations engagement was not undertaken at the start of the process [103], meaning free, prior and informed consent for the Shellfish Development Initiative could not be attained. However, First Nations were later identified as key beneficiaries of the Shellfish Development Initiative [103], leading to deeper engagement. Throughout the late 1990 s and early 2000 s, the BC Provincial Government offered at least 20 First Nations funding and priority access to marine tenure leases through treaty negotiation-related Memoranda of Understanding [83].

First Nations have the potential to be key beneficiaries of the expanding shellfish aquaculture sector [83], provided development confers benefits to rights holders, rather than infringing upon them. The leverages, challenges and opportunities relating to SLO are highlighted in Table 2 and the policies that are particularly relevant to this case are summarised in Fig. 1.

5. Discussion and conclusions

The variation of development of the Blue Economy sector across New Zealand, Australia and Canada was apparent from the review and it remains an emerging sector of economic opportunity for Indigenous Peoples. The case studies selected for this review reflect variable scales of operations, profitability and feasibility horizons, proximity to Indigenous communities, legislative contexts that enable the exercise of Indigenous rights, corporate structures, impact considerations to the environment and cultural heritage, and time and market constraints. They also reflect a variety of human and financial resources at the disposal of Indigenous Peoples, government administrative and policy settings and arrangements as well as colonial histories and cultural contexts and practices. The fact that few examples of successful undertakings are documented in the literature illustrates both the nascency of large Blue Economy sector partnerships with Indigenous Peoples and the continued learning necessary to generate more mutually beneficial partnerships from aquaculture and renewable energy projects.

The cases illustrate the dynamic interaction of legal regimes and mechanisms, natural resource and business context and the agency of Indigenous actors to mobilise their political and cultural resources to leverage existing relationships and policy mechanisms to create economic opportunities. The Canadian and Australian case studies demonstrate innovations by Indigenous Peoples to leverage access and use of property rights to establish Blue Economy opportunities. In Australia, Traditional Owners entered into shared decision-making arrangements with external parties through trusted relationships nurtured over time and by utilising Western legal mechanisms to access resources as capital holdings and decision-making business partners. The Australian case studies demonstrate that while legal mechanisms are important they are one of multiple factors that initiate and sustain business partnerships [28]. SLO is developed through innovations in the use of property rights in each business model. The business partnerships demonstrate the result of long-term agreement-making between Indigenous corporations and industry as partners, and government in supporting the capital mechanisms and enabling policy context [30].

In Australia and Canada, Indigenous Peoples have created their own 'transformative praxis' [Coulthard 2007, in 7] where they have deployed their cultural resources and institutions as partners. Each of the case studies demonstrate the central role of Indigenous actors, who mobilised their ancestral rights and authority through the endorsement of the collective group and Indigenous governance, and the support of industry and government, to reclaim their resources to initiate Blue Economy business opportunities. Business development goals were situated within broader aspirations and obligations of stewardship of the environment, cultural responsibilities and capacity building for current and future generations [7,46]. The Australian case studies demonstrate the beginning of new partnership arrangements between Aboriginal

¹ These moratoria along with other regulatory changes and changes in salmon aquaculture development strategy in BC are summarised in Fig. 1.

businesses and communities with the commercial aquaculture industry that are transparent regarding Aboriginal groups' long-term interests and business values. They also demonstrate the networks that industry and Aboriginal businesses are initiating to create capacity development pathways across Aboriginal communities. Indigenous centred SLO places Indigenous Peoples in control of determining Indigenous development and sustainable development, a crucial element in strengthening equitable outcomes in the Blue Economy [46]. Notably, questions around how Indigenous centred SLO intersects with and relates to non-Indigenous SLO – while beyond the scope of this paper – represent a valuable and important line of enquiry that should be addressed in future work.

The case examples demonstrate that SLO relies on Indigenous Peoples being partners, and a partnership model that strengthens their unique place-based cultures and resources, particularly where these are part of the business product. The enterprises are intimately linked to the renewal and exercise of rights in economic partnerships. For example, in Australia, Wanna Mar CEO mentioned Traditional Owners continuing to exercise their rights to fishing on their Sea Country through their aquaculture business partnership. Responsibilities to younger and future generations are included in the business plans to build capacity across the business supply chain, in decision-making roles, and in stewardship programs such as environmental monitoring. Indigenous centred SLO exists where these aspirations are supported by and through the business partnership. A significant foundation of the partnerships is that non-Indigenous partners' business agendas appear to align with the type of relationship building their Indigenous business partners seek [45]. The Australian case studies illustrate a partnership where Indigenous Peoples rights, interests and perspectives are an asset in the business model and a key condition for the sustainability of the two Blue Economy industries.

The Australian, New Zealand and Canadian examples demonstrate that processes for deeper and meaningful First Nations engagement with FPIC can be enabled within regulatory changes. Retention of benefits and economic opportunities within communities as well as decision-making rights at all stages of aquaculture development are critical considerations in upholding Indigenous rights and enabling FPIC. The examples demonstrate that agreement-making with First Nations Peoples from the outset of aquaculture projects have to be inclusive of processes that enable FPIC at each stage and across generations where new social and cultural risks and opportunities emerge over time and through development activities. Indigenous-centred SLO situates empowerment in Indigenous-led decision-making processes in determining and managing the risks and benefits delivered through economic opportunities and capacity building with rights holders as well as the community at-large. Mobilisation of FPIC as a procedural quality of agreement making sets the conditions to negotiate and uphold equity for and with Indigenous Peoples in the Blue Economy.

While significant advances have been made in inclusion and recognition of Indigenous Peoples as rights holders in Blue Economy activities in some respects, more can be done and would benefit from enabling Indigenous innovation in SLO. Key insights from our review are:

- 1) Indigenous centred SLO is based on building the capacity of existing institutions where operations are understood and can be adapted for expanding business processes that attend to place-based relationships [46]. In successful case examples, strengthening and building of Indigenous institutions began well before business operations and work with Indigenous institutions is driven by their priorities and visions for their future.
- 2) Indigenous Peoples prioritised their place-based projects and proceed to negotiate through Indigenous leadership and institutions.
- 3) Indigenous centred SLO is enabled when development proponents and government engage in long-term deliberations and negotiations with Indigenous Peoples that builds on existing institutions [7].
- 4) Institutions participating in Indigenous centred SLO fit within social-ecological systems of the associated resource-based enterprise in a way that connects relationships to place across regional, national and international actors [48].
- 5) Partnerships between an Indigenous partner and Industry can facilitate innovative Indigenous enterprise opportunities that deliver community-wide social and economic opportunities (across youth, different genders, and elders) [104].
- 6) Indigenous centred SLO mobilises resources and networks at multiple scales to negotiate place-based and local outcomes and to mitigate risk concerns [48].
- 7) Conditions for consent are re-negotiated within and across generations based on cultural and social risk perspectives, benefits and opportunities and changing capacities in the reassertion of cultural authority as decision-making partners (not as stakeholders or interest groups).

The Blue Economy refers to new practices and ways of organising to enable equitable social, cultural, economic and environmental outcomes from marine economies. We suggest that securing equity in the Blue Economy calls for a shift in practice of SLO such that embedded consent processes are based on Indigenous perspectives of SLO at all stages of the project life-cycle. Long-term relationship building and on-going negotiations with continuous learning are central if Blue Economy partnerships are to genuinely value and embed Indigenous perspectives within their business models and visions for success. A shift in practice across the Blue Economy requires consideration of multiple collaborative arrangements and agreement-making across scales, sectors and generations to deliver the diverse social, cultural, environmental, economic benefits sought by Indigenous Peoples.

Declarations of interest

None

Data Availability

No data was used for the research described in the article.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.marpol.2022.105384](https://doi.org/10.1016/j.marpol.2022.105384).

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