

# PESTLE ANALYSIS OF THE MĀORI MARINE ECONOMY TO IDENTIFY TRENDS AND RESEARCH THEMES



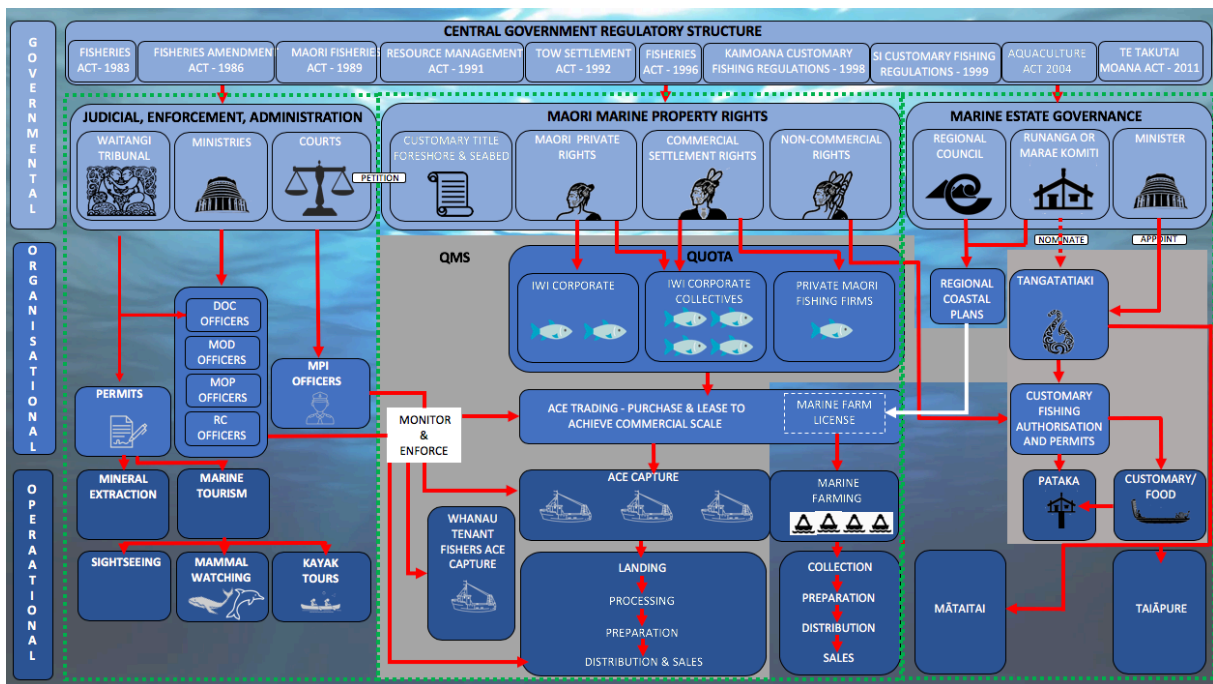
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# Introduction

The first section of this report examines the political, economic, social, technological, legal and environmental (PESTLE) factors across the Māori marine economy (MME). Data for this analysis was accessed through literature review, desktop analysis, and interviews with key stakeholders. The PESTLE analysis established a foundation for the second section of this report, which identifies the trends, issues, and possible research opportunities concerning the MME. The purpose of this analysis is to assist the Sustainable Seas National Science Challenge in prioritizing areas for research concerning the MME.

Map of Māori marine economy:



# SECTION ONE – PESTLE ANALYSIS

## Executive Summary

### Political

- Māori operate in a complex political environment that is a legacy of colonization and Treaty of Waitangi settlement processes.
- Māori are politically engaged at multiple scales including pan-iwi, iwi, hapū, marae komiti, and whānau.
- Unique and dynamic structures have been developed to manage political tensions and interests across these scales to support: economic development; the protection of property rights; governance; and management in the marine estate.
- Māori view the current national political environment as too centralized and overly compartmentalized (but well-functioning within many components).
- A national blue economy strategy and framework for marine governance and management are needed to guide local action.
- Māori are concerned that new governance, conservation, and management regimes may abrogate their Treaty rights.

### Economic

- Māori are significant participants in New Zealand's (NZ) marine economy with interests in wild fisheries, aquaculture, marine tourism, and non-market customary harvest.
- Māori marine economy (MME) focused in wild fisheries. Māori have 35% interest in the seafood industry by value, and have doubled their economic interests since Settlement.
- 45% of this value is in four species, three of which are highly vulnerable climate change.
- Economic engagement - 45% of iwi have developed joint ventures with other iwi to create economies of scale. 8% of iwi are fishing their own quota, 10% are processing their own fish, 10% are self-branding, and 8% are exporting, of which most are exporting under their own brand
- Aquaculture - Around 13% of Māori entities have licenses to marine farm, while 8% are marine farming (mussels and paua).
- Tourism - Ngāi Tahu and Ngāti Awa are successfully operating marine tourism initiatives.
- Growth from value-adding – There is little room for volume growth in wild fisheries, instead growth must come from improvements and innovations that add value.
- Aquaculture potential – There is significant potential to expand aquaculture; although there are limitations in terms know-how and long-term research investments associated with new species.
- Economic planning – Māori are seeking to develop economic initiatives that create multipliers such as community employment.
- Premium markets – there are consumers that are willing to pay more for products produced according to Māori values.

### Sociocultural Factors

- Capability development – young, competent Māori should be supported to build experience and capabilities in overseas settings in order to bring new ideas and technologies back home.
- Enforcement and management – Māori coastal communities are well-placed to support local governance and management of coastal marine areas.

- Matauranga Māori has a significant role to play in the governance and management of the marine estate including:
  - Establishing legal personalities for ecosystems and species;
  - Mauri-centred monitoring and reporting frameworks; and
  - Marae-centred protocols and Māori decentralized governing models that offer unique insights and opportunities in the development EBM and other resource management processes.

## Technology

- Technological improvements in the MME have primarily occurred in fishing and supply chain operations, and to a much lesser extent tourism.
- Generally-speaking, uptake and development of blue technology in the MME has been initiated by smaller agile fishing companies.
- Improvements have occurred through the adoption of sustainability fishing technologies, tracing systems, provenance, indigenous-centred marketing, and environmental packaging.
- Innovations have occurred through the development of: new harvesting technologies; new aquaculture species; seaweed production; and marine mammal locating techniques.
- There are significant opportunities in the land-sea interface including: Māori landowners developing alternative biodegradable fibre options (e.g. nets and packaging); and growing and developing aquaculture feed.
- Developing multi-trophic aquaculture to take pressure off wild fisheries.

## Legal

- The marine legislative and regulatory framework Māori operate in is highly complex, Māori marine rights are contingent on ongoing Crown support.
- There are tensions between individual iwi and pan-Māori rights, and between commercial and customary rights.
- Commercial rights issues – iwi forced to form non-traditional corporate structures to get quota; Settlement quota cannot be sold and can only be traded amongst iwi, devaluing it. Settlement quota often uneconomic to fish at an iwi level.
- Customary rights issues – Māori cannot sell fish caught under these rights; creating customary management areas & acquiring customary rights is difficult, requiring social/financial capital; Maori commercial fishers often supply iwi with customary harvest, which is a complex, contentious process; customary areas create tensions with some recreational fishers.
- Opportunities – fragmented quota has forced iwi to innovate at governance/management level; TOKM is advocating for a number of changes to QMS that would strengthen Māori marine rights; customary management areas and rights provide strategic space to help repopulate fish stocks/areas for marine tourism.

## Environmental

- Mātauranga Māori (Māori knowledge) provides a holistic and centuries deep repository of environmental information about marine species and ecosystems that complements scientific information. However, scientific community not always positive about mātauranga Māori.
- Māori have a whole of ecosystem approach that matches ecosystem-based management.
- This approach is also focused on both land and sea, and could help overcome the current divisions between the management of these two estates in NZ.
- Mātauranga Māori and Māori resource management operate at local scales. Fisheries management and information gathering should utilise this localised knowledge and capacity.

- Most Māori fishing companies have kaitiakitanga at core of governance & operations and go above and beyond environmental regulatory requirements. This needs to be emphasised more in marketing. Kaitiakitanga drives much of the innovation in the sector.

## Political Factors

### Historical Overview

The traditional political unit for Māori was the hapū (clan).<sup>i</sup> Hapū were governed by a combination of hereditary authority and deliberative marae-centred protocol. Prior to colonization hapū had jurisdiction over particular marine territories and protected these areas from encroachment or exploitation.<sup>ii</sup> Hapū confederations, referred to as iwi, established alliances to repel territorial invasions from neighbouring iwi. Hapū possessed and managed their own marine property right systems and resource management methods.<sup>iii</sup> These systems were eroded through colonization; however, marine property rights were never purchased from Māori. Constitutionally this meant that tino rangatiratanga (self-governance) and aboriginal property rights over the marine estate remained in place according to Te Tiriti o Waitangi.<sup>iv</sup>

This constitutional situation surfaced in the 1980s when the Crown attempted to introduce the Quota Management System (QMS) and Individual Transferable Quota (ITQ).<sup>v</sup> A High Court decision determined that without having purchased marine property rights the Crown could not distribute and administer rights that still belonged to hapū.<sup>vi</sup> A Settlement process followed where Māori were offered compensatory property rights and assets for support in the introduction of the QMS.<sup>vii</sup> The Crown demanded that the Settlement negotiation be conducted with 'large natural groupings' of iwi, rather than the traditional hapū property right holders.<sup>viii</sup> The QMS was only implemented once legal action by Maori was lifted. It is therefore the only system endorsed by Māori for the management of fisheries within Aotearoa.<sup>ix</sup>

The Fisheries Settlement process provided quota and a 50% share in the company Sealord to Māori. However, Māori were required to establish the formula for the distribution of Settlement assets across iwi. A formula was developed based upon population size and coastal territory.<sup>x</sup> Quota property rights and assets were vested within iwi elected authorities and placed in holdings corporations to manage assets for a Return on Investment (ROI).<sup>xi</sup> This is known as the corporate-beneficiary model. A new class of non-market customary rights were also established to enable the utilization of marine resources to maintain customs.<sup>xii</sup>

### Intra-Iwi Politics and Organizational Responses

The intra-iwi political situation today is a legacy of colonization and Treaty Settlement processes. There are commonly centre-periphery tensions between iwi authorities and hapū communities.<sup>xiii</sup> Traditionalists view iwi political bodies and asset holding corporations as imposed structures that remove the authority and property rights of hapū and constituent whānau. There are demands and pressure for the decentralization of fisheries assets and the establishment of employment-rich economic opportunities in coastal communities. Tensions between tribal corporations and their iwi owners are common. In particular, internal communications issues have been highlighted as problematic.

Ngāi Tahu has experimented with the development of decentralized business models to support whānau-scale business to address the centre-periphery challenge.<sup>xiv</sup> While iwi such as Ngāti Porou and Kahungunu are investing in initiatives to create more local employment opportunities. Iwi have also built novel decentralized political processes for responding to coastal resource management consultation requirements and customary harvesting initiatives.<sup>xv</sup> Regional Councils are required to consult with iwi in the development of coastal management plans according to the Resource Management Act 1991. Iwi respond through the development of Iwi Management Plans. Drawing on tikanga Māori, many iwi have developed their own internal bottom-up, cultural protocols for developing plans through defining hapū territorial boundaries and harnessing the mātauranga, experience, and insights, of coastal marae-centred communities. Similarly, iwi have developed processes for the appointment of community-centred Tāngatatiaki (customary management area authorities/guardians), that are authorized to issue customary fishing permits.<sup>xvi</sup>

### Inter-iwi politics

The fisheries Settlement formula generated a number of territorial boundary disputes between iwi that have now been mostly resolved.<sup>xvii</sup> However, such disputes have longer histories that relate to precolonial conflict and tensions that can still make their way into contemporary inter-iwi politics.

The distribution of fisheries assets amongst 57 iwi also produced the effect of fragmenting quota ownership.<sup>xviii</sup> This means that few iwi have enough quota of particular species to operate economically efficient fishing operations, so must trade their annual catch entitlements, or establish joint ventures with other fishing companies.

Te Ohu Kaimoana (TOKM) claimed in its 2017 review that the fragmented iwi-Government relationships allow Government to adopt divide and conquer tactics in the development of marine, fisheries and environmental policy.<sup>xix</sup>

The need for economic cooperation has driven political collaboration between iwi and the development of innovative pan-iwi governing structures to oversee commercial operations. The prime example of this is the Iwi Collective Partnership. (ICP).

## Pan-iwi

The Māori Fisheries Act 1989 also resulted in the creation of Te Ohu Kaimoana (TOKM), a statutory organisation, to govern collectively held Māori fisheries assets, and to play a governance and advocacy role for Māori fisheries.<sup>xx</sup> TOKM was allocated the commercial assets – Settlement quota, income shares in Aotearoa Fisheries Limited (now Moana New Zealand) and cash – to iwi as prescribed by the allocation model outlined in the 2004 Māori Fisheries Act. TOKM holds the control shares of all the Settlement assets to ensure that the interests of all iwi are advanced.<sup>xxi</sup> TOKM was also tasked with transferring fisheries assets and funds from the Settlement to iwi organisations.<sup>xxii</sup> The 2004 Māori Fisheries Act restructured TOKM, splitting it up into a set of companies and trusts.

In the mid-2010s TOKM faced challenges from iwi and Māori regarding its role and structure, with a review conducted that sought to determine whether it should continue and if it was to continue whether it should be restructured.<sup>xxiii</sup> Ultimately, it was decided that TOKM would continue its role and functions, but in a restructured form.<sup>xxiv</sup>

TOKM has also issued a number of reports outlining the current situation in the Māori fisheries sector. In its 2017 report TOKM stated that “[m]ost iwi are passive quota owners and not deeply engaged in the active fishing industry or well represented in the key decision-making structures within the wider fishing sector. This places most iwi at a distance from the actual business of fishing and fisheries management”.<sup>xxv</sup> The report also warns “the collective Māori focus on maintenance of rights [has] diminished from that of previous years”.<sup>xxvi</sup> The report also outlined that:

“From a position of strength in 1992, Māori now face a situation where Deed of Settlement rights are under increasing threat of unilateral extinguishment by Government emboldened by Māori complacency regarding fisheries rights protection. Government confidence has also been emboldened by increasing diversity of iwi views on the relative importance of commercial fisheries compared to iwi environmental perspectives and individual political positioning. From a position of general unity in 1992 regarding Treaty rights, iwi are now more diverse in their views regarding how fisheries rights should be balanced and exercised. This lack of unity creates risk when dealing with a Treaty Partner who is highly selective in its approach to dealing with Māori issues”.<sup>xxvii</sup>

TOKM characterised the period following the 2004 Act as one of fragmentation amongst iwi and resulting weakness. TOKM concluded that iwi need to be “working collectively to develop national and regional fisheries policy which protects and advances the full range of Māori traditional fisheries rights guaranteed under the Deed of Settlement”.<sup>xxviii</sup>

## The National Marine Economy through a Māori lens

The general view of Māori is that the national politics regarding the marine economy is characterized by centralization, competition, compartmentalization and fragmentation. In particular the following features were identified<sup>xxix</sup>:

- There is no overarching strategy that ensures that policies and regulations regarding the marine economy are working in synergy.



- Although Crown entities are considered effective and competent they are deemed to work in silos from one another and have different and competing agendas.
- Forums do not exist for getting all political players in a room, with all of the evidence available, to form a comprehensive overarching economic strategy. It was noted that New Zealand was too small, from an international perspective, not to have such a strategy in place.
- The Ministry of Primary Industries (MPI) carries a significant amount of power within the marine economy relative to other Crown entities.
- There is a need for more decentralization and local empowerment to ensure effective coastal resource management
- The need for the development of collaborative planning approaches centred at local scales but within a national framework was highlighted.
- The need for broad collaboration across industry, science, and community through transdisciplinary processes was noted.
- Some iwi are locked into orthodox practices in part due to a range of internal and external political, legal and institutional constraints.
- Positively, Māori generally viewed Aotearoa New Zealand as leading in indigenous models and collaboration.
- Māori need to work together across the 57 iwi and TOKM to both protect their current rights and to collectively increase the value of these rights through integrated supply chains.

## Māori as Multiple Stakeholders

Māori have political interests across multiple stakeholder spheres in the marine economy including: commercial; customary; recreational; and conservation. The tensions between these different spheres are managed internally through traditional decision-making processes and structures to arrive at local, iwi, and national political positions on different issues. These structures and processes could be adapted and applied nationally outside of the Māori sphere to support greater collaboration, transdisciplinary process, and multi-stakeholder decision-making.

## Relevance of the Treaty of Waitangi

Apprehension was expressed over the potential abrogation of Treaty rights through various plans and initiatives in the marine estate. The development of large marine reserves in areas where Māori possess Treaty rights was deemed a potential Treaty violation. One interviewee commented: *'we were dispossessed by a sovereign government now we are being dispossessed by conservationists'*.<sup>xxx</sup>

The proposed introduction of ecosystem-based management (EBM) is being approached with caution for a number of reasons.<sup>xxxii</sup> Māori are deeply concerned about being relegated to a stakeholder role within EBM processes, which could undermine their current Treaty-based property and governing rights. Crown-iwi co-governing institutions would likely need to be developed to sit over EBM processes if EBM were to be accepted by Māori. It was suggested that the Treaty of Waitangi could be used as the basis for marine governance, and in particular the way in which it might be given effect at local scales

Concern was expressed regarding climate change and the impact on quota.<sup>xxxiii</sup> Declining abundance levels of particular species will require MPI to reduce Total Allowable Catches (TAC) in particular Quota Management Areas (QMAs), which will impact the value of quota held by various iwi. There are questions how this will be managed within the Treaty Settlement and compensation framework. Furthermore, the same principle applies with over allocations, whereby quota may need to be reduced.

## Innovation Inertia

The Treaty Settlement process and subsequent fragmentation of quota as well as the creation of the iwi corporation and the formation of pan-iwi authorities have all demanded the development of comprehensive Māori institutional structures. The process has taken many years and demanded that many iwi focus on practical governance, legal, and management issues which has in some circumstances reduced focus on innovation.<sup>xxxiii</sup>

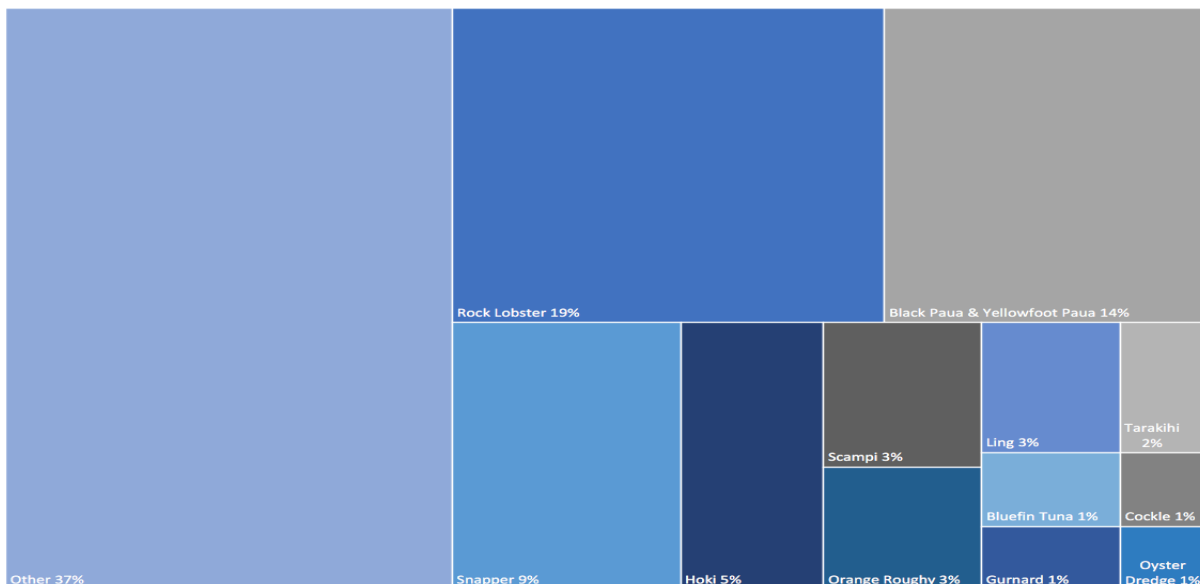
## Economic Factors

Māori are significant participants in New Zealand’s marine economy with interests in wild fisheries, aquaculture, marine tourism, and non-market customary harvest. Māori do not appear to be involved in mineral extraction, or the marine transport sector.<sup>xxxiv</sup>

### Wild Fisheries

Ownership of wild fisheries across New Zealand have become consolidated within 10 companies that own 80% of the quota by volume. Iwi own roughly 20% of wild fisheries quota by value and 33% by volume. Around 61% of iwi have purchased quota since Settlement to supplement the fragmented Settlement (SET) quota, in total Māori have acquired \$321 million in quota assets in addition to the \$314 million in their original SET quota. Quota and the ACE it generates is the core asset of the Fisheries Settlement.<sup>xxxv</sup>

New Zealand seafood industry has a value of \$1.8 billion (2017 total export earning) per annum.<sup>xxxvi</sup> The Māori Marine Economy is roughly a third of this value, with a value of \$635 million (2018 total export earning).<sup>xxxvii</sup> Around 47% of total MME value comes from 4 species: lobster, paua, snapper and hoki (the value of different quota species can be seen in the graph below, source Reid, Rout and Mika 2019).<sup>xxxviii</sup> This reliance on such a small set of valuable species is a risk to the MME.<sup>xxxix</sup>



Analysis shows that 45% of iwi have gone into joint-venture partnerships with other iwi and non-Māori fishing companies to fish their quota, 8% are fishing their own quota, 10% are processing their own fish, 10% are self-branding, and 8% are exporting, of which 90% are exporting under their own brand.

### Aquaculture

Around 13% of Māori entities have licenses to marine farm, while 8% are marine farming.<sup>xl</sup>

Māori commercial aquaculture is focused on green-lipped mussels and paua; however, experiments are under development in other species including scampi.

## Marine Tourism

Two iwi have developed marine-related tourism ventures: Ngāi Tahu and Kaikoura whānau have developed Whale Watch Kaikoura; while Ngāti Awa has purchased, and is developing, White Island Tours.

## Non-Market Customary Economic Activity

In regard to non-market customary economic activity there is little data available. A desktop scan determined that 13% of iwi were involved in non-market customary fishing initiatives, 9% were utilising the pātaka system (allows commercial vessels to harvest customary fish), and 14% have established taiāpure and mātaītai to ensure ongoing sustainable supply of taonga species.<sup>xli</sup> Concerns were raised regarding excessive permitting and exploitation of the customary system.<sup>xlii</sup>

## Economic Development

Using current practice there are limits to development of the MME across wild fisheries, aquaculture, marine tourism, customary harvest and resource management.

Wild fisheries are the most profitable, but are restricted by quota with the export volume only increasing by 0.2% per annum.<sup>xliii</sup> There is little room for volume growth, instead growth must come from improvements and innovations that add value. The wild fisheries are dominated by a few large players. General comments from Māori leadership was that the businesses were generally operating in the volume and commodity space following low-cost strategies rather than high-value and differentiation.<sup>xliiv</sup> There is a trend of moving from species to species as stock levels drop. There are, however, attempts to move into the value-add area through sustainability branding, provenance, indigenous story-telling (to be discussed in marketing section). However, there is a lot of wastage

There is significant potential to expand aquaculture. However, it is expensive to set up, knowledge intensive, can take decades to develop, and is relatively risky.<sup>xliiv</sup> The wider aquaculture sector has also failed to understand the market properly, following a development first, then to market approach.<sup>xlivi</sup> With limited access to the required capabilities and development capital Māori tend to partner with more experienced partners and investors – sticking to proven species and methods. There are opportunities to farm new species; however, there are risks involved that will be discussed in the technology section. Regarding mussel farming, one interviewee explained that there has been little drive to increase value to date, explaining that this was partly because selling to China is currently the easiest channel but this has not encouraged innovation or connecting with the consumer.<sup>xlvii</sup> Māori need to look at the value added proposition of aquaculture products and the various levels of the value chain that can be leveraged to enhance the marketability of our exports.

There is potential for the expansion of marine tourism. Currently, Māori lead two of the largest and most successful marine tourism initiatives. However there have also been a series of start-up failures.<sup>xlviii</sup> Generally speaking, successful enterprises require an original idea, strong investment, and governing capacity.<sup>xlix</sup> A significant risk to marine tourism is the carbon footprint of tourism given Aotearoa New Zealand's distance to markets.

Customary non-market activity is small. There is room for development, however, with tools and processes for customary harvest developed, such as permitting processes and pātaka (food storage) systems established by iwi such as Ngāi Tahu, becoming expanded. Furthermore, the potential to expand customary harvest to meet the needs of Māori with food security and nutrition issues is an area for exploration.

Iwi, and Māori generally, are interested in strategic economic planning regionally and nationally to generate economic multipliers (e.g. employment and wellbeing) for Māori communities. Excessive focus on business development, at the expense of more fundamental strategic economic development and planning, is unlikely to generate the blue economy outcomes Māori are seeking.

TOKM has noted that Māori commercial seafood companies continue to compete with one another to sell their products to predominantly the same customers.<sup>i</sup> This was also noted by an interviewee, who said ‘*Competition is dumb in a small economy – we need to measure our levels of cooperation for success*’.<sup>li</sup>

## Markets

Analysis demonstrates that Māori ethical orientations and concepts underpinning resource management, service delivery, food harvesting, processing and production resonate strongly with a range of high value niche markets.<sup>lii</sup> Efforts are being made to communicate the attributes of Māori products through story-telling of history and local cultural context; however better informed agile marketing is needed to resonate and target specific markets with different cultural orientations.

Asia and Middle Eastern markets share similar concepts to Māori in regards to manaakitanga (hospitality) and whanaungatanga (relationships development) and are willing to pay more for, and engage in long-term relationships built upon, these ethics.<sup>liii</sup> Key Māori values such as mauri (healthful life energy) are shared across Asia and India.<sup>liv</sup> The expressions of self-sufficiency and independence that underpin mahinga kai are also strong drivers in the popular hunting movements in Western states across Europe and America.<sup>lv</sup> A range of international food movements, primarily paleo and integrated health, demonstrate strong resonance with indigenous hunting and gathering culture.<sup>lvi</sup> The ethic of kaitiakitanga resonates strongly with a variety of environmentally conscious consumers seeking to support socioecological sustainability.<sup>lvii</sup> There are indigenous markets in other Anglo settler states that have potential.<sup>lviii</sup>

## Social/Cultural Factors

### Capability

Internationally there are multiple governments, organizations and industries developing and applying innovative technologies and approaches to building blue economies. The need to bring these ideas and technologies to Māori businesses and governing bodies was highlighted.<sup>lix</sup> In particular, it was suggested that young, competent Māori should be supported to build experience and capabilities in overseas settings in order to bring ideas back home.

Furthermore, it was noted that Māori, and Kiwis in general, are very innovative but their ‘do it yourself’ mentality means that they try to reinvent everything themselves and do not readily adopt tested technologies and ideas readily from overseas.<sup>lx</sup> Training in the utilization and adaption of existing approaches was recommended.

One interviewee noted that it was important to engage local Māori communities in enforcement as they are well situated and motivated.<sup>lxi</sup>

Shared tikanga, mātauranga, values and world view form a strong basis for wider collaboration across the MME.<sup>lxii</sup>

TOKM has noted that there is a general lack of Māori expertise in the fisheries sector and associated QMS.<sup>lxiii</sup>

### Crisis Driving Change

The pace of change within the MME is not rapid, and the approach to economic development has been mostly conservative. There are fears that adaptation and innovation will only be driven in response to a crisis, or a ‘tipping point’ as opposed to risk anticipation (e.g. climate change).<sup>lxiv</sup> This slow rate of innovation has also been hampered by the relative ease of the status quo, particularly market access to China.<sup>lxv</sup>

## The Role of Mātauranga Māori

In the terrestrial estate Māori have established legal personalities for non-human entities such as rivers and national parks. The same approach may be applied to the marine estate where ecosystems and species could have legal personalities formed and kaitiaki trusts, across and between rohe (tribal areas), established to govern the ongoing maintenance of their mauri/health and welfare.<sup>lxvi</sup>

Mauri indicator approaches have emerged out of Māori ontology and epistemology and provide effective science-grounded models for determining the health and abundance of ecosystems, and their constituent human and non-human communities.<sup>lxvii</sup> Mauri indicators offer a transdisciplinary approaches that allow different disciplines to talk to one another when measuring and determining socioecological wellbeing.

Marae-centred protocols and Māori decentralized governing models offer unique insights and opportunities in the development EBM and other resource management processes.

Mātauranga Māori is also offering unique technical insights into applied methods and techniques to understanding a range of key issues including: ecosystem processes and harvesting technologies. This will be discussed further in the next section.<sup>lxviii</sup>

## Technology

### Context

The technological improvements in the MME have primarily occurred in fishing and supply chain operations, and to a much lesser extent tourism.

Generally-speaking, uptake and development of blue technology in the MME has been initiated by the smaller Māori fishing companies that are more agile. Three of note are Okains Bay Seafood, Waikawa Fishing Company, and Kono (a Wakatu Incorporation business). More recently, the larger companies are following, led by Moana NZ.

Smaller Māori fishing companies, that are dependent on purchasing ACE to make their operations economic, fear the larger companies and claim are they are driving up the price of ACE beyond true market value to squeeze out competitors and create high barriers to market entry.<sup>lxix</sup>

### Improvement and Innovation

The development and adoption of blue technologies across the MME is occurring in two forms: improvement and innovation. Each are these are discussed below.

Improvement involves the adoption of best practice. Māori businesses have been adopting best practice in the following areas:

- The use of longlines to reduce bycatch.
- The use of QR codes to trace provenance from sea to plate
- The adoption of ecosystem services accounting to measure business performance against social and ecological factors.
- Achieving Aquaculture Stewardship Council (ASC) certification.
- The development of indigenous kaitiaki (stewardship)-centred marketing.
- The establishment of best practice governance across various Māori authorities.

In contrast to improvement, innovation involves new thinking that results in a new product, practice, or process. Our scan shows that Māori business have been innovating in the following areas:

- The development of scampi potting technologies based on mātauranga Māori and science.
- The exploration for future development of scampi aquaculture.
- The development of precision harvesting technologies to reduce or eliminate bycatch based on mātauranga Māori and science.

- The development of organic alternatives to polystyrene boxes for fish transport.
- The exploration and testing of seaweed harvesting and production.
- The development of marine mammal locating technology for tourism and research.
- The development of mobile phone apps enable customary kaitiaki to both authorise and monitor the gathering of kaimoana via smartphone.<sup>lxx</sup>

## Risks and Opportunities

Live transport to markets is a major risk to the MME, particularly in regard to the carbon emissions associated with this transport. The MME is particularly vulnerable in this regard due to heavy investment in koura and paua – both of which are live export species. Alternative low-carbon technologies for live transport are needed.

Much of the fishing sector utilizes non-biodegradable plastics throughout supply chain operations – from nets through to packaging for distribution. There are significant opportunities for Māori land-based industries, such as forestry and wool, to be developing alternative biodegradable fibre options for the NZ fishing industry and abroad.

Little emphasis is placed on opportunities at the land-sea interface. In particular there is opportunity for sustainable on-land feed production on Māori land to supply coastal and offshore fish farms.

There is significant potential for the expansion of aquaculture both in scale, species, and methods (e.g. multi-trophic) to take pressure off wild fisheries. As noted in the economic section, the wild fisheries cannot grow other than through adding value and gaining premium market access. However, barriers to expansion were outlined by Māori leaders. First, the development of new aquaculture species in New Zealand involves a significant R&D effort and takes approximately 20 years to reach commercial viability.<sup>lxxi</sup> Research funding timeframes are too short (maximum funding length is usually about 8 years) to encourage the type of research needed and attract the co-investment from industry required.

There exists significant potential to bring Māori scientists and industry together across sectors to explore novel and promising research options.

Although Māori own 33% of the quota by volume, they only own 20% by value. This is because Māori own high volumes of low value quota. There is significant potential in exploring the technological development and operations needed to bring new species to market.<sup>lxxii</sup>

## Legal Factors

### Context

The introduction of the QMS in the early 1980s marked the beginning of a litigious period for Māori over their marine rights.<sup>lxxiii</sup> The contemporary legal framework is a result of this successful litigation and resultant negotiation. In particular, the Settlement quota received by Māori, the mandated iwi organization iwi formed to receive the quota, the pan-iwi group TOKM that holds some quota and the Settlement assets and advocates on behalf of Maori, and the laws surrounding customary harvest, management and rights.

The MME is governed by a number of key pieces of legislation, including: The 1983 Fisheries Act and 1986 Amendment; the 1989 Māori Fisheries Act; the 1992 ‘Sealords’ Treaty of Waitangi Settlement Act; the 1996 Fisheries Act; Customary Fishing Regulations of 1998/1999; the 2004 Māori Fisheries Act; the 2004 Maori Commercial Aquaculture Claims Settlement; and the Marine and Coastal Area (Takutai Moana) Act.<sup>lxxiv</sup>

### Problems

New Zealand’s marine legislative and regulatory framework is highly complex, with numerous overlapping laws and responsible organizations. In particular, Māori have to deal with a wide range of different laws, some specific to their rights and others general to the wider marine economy.<sup>lxxv</sup> This was noted by an interviewee, who

commented on the compartmentalization and fragmentation of the legal framework, and resulting organizations, that govern and manage the marine estate, and the Māori component of that estate.<sup>lxxvi</sup>

The delineation between individual iwi rights and collective pan-Māori rights remains unclear. TOKM noted in its 2017 report that the development of a Māori fisheries strategy to guide future Māori fisheries development requires understanding where the commonality of Māori rights ends and the diversity of iwi rights begins.<sup>lxxvii</sup> TOKM believes that it is clear that a Māori fisheries strategy should not be concerned with fishing but with the maintenance and advancement of collective Māori fishing rights guaranteed under the Deed of Settlement.<sup>lxxviii</sup>

The MME faces ongoing threats from regulatory changes that would impact the full and final nature of the Fisheries Settlement and the financial value of the Settlement. For example, the Kermadec Ocean Sanctuary Bill was viewed as compromising the rights that iwi were guaranteed by the Deed of Settlement.<sup>lxxix</sup> While unified action by TOKM and iwi saw this Bill effectively delayed indefinitely TOKM are concerned that Fisheries New Zealand's recent proposals on the review of sustainability measures for the 2019/20 fishing year are not consistent with the Māori Fisheries Deed of Settlement.<sup>lxxx</sup> TOKM explain that the 1996 Fisheries Act requires those performing functions under it to act consistently with the Māori Fisheries Settlement and then more specifically that the Minister must ensure the integrity of Māori fishing rights is maintained when adjusting the total allowable catch or TAC.<sup>lxxxi</sup> It is TOKM's position that the proportion of the total allowable commercial catch that makes up the TAC should not be reduced (but can be increased) by reallocations to the recreational sector as any reallocation to the recreational sector will reduce the overall value of Māori Fisheries Settlement quota.<sup>lxxxii</sup>

The division between commercial and customary rights continues to create problems. Māori commercial fisheries are conceived of as 'non-customary' while customary fisheries are identified as 'non-commercial'.<sup>lxxxiii</sup> However, people do not naturally operate in this distinct binary form, Māori non-commercial' fishers produce fish, distribute catch to family and community members, and exchange fish for other things, including cash, and Māori 'commercial' fishers at times fish for customary occasions.<sup>lxxxiv</sup>

## Commercial

To receive their quota Māori were required to form mandated iwi organizations (MIO) that met certain structural requirements that blend a corporate structure with a charitable trust fund complex.<sup>lxxxv</sup> These structures and the distance they create between governance/ownership and the active usage of the resource have been the source of the ongoing tensions within iwi discussed in the political section. Furthermore, the large number of MIO creates cost duplication and constraints on social/human/financial capital.<sup>lxxxvi</sup>

Another issue is that Māori have different rules applied to their Settlement quota. Specifically, they are not able to sell it on the open market, which has devalued the quota, but can only trade it 'in-kind' with other iwi.<sup>lxxxvii</sup> It has been estimated that up to 30% of the Settlement value is lost as iwi are restricted to trading quota amongst themselves.<sup>lxxxviii</sup> To date, this form of quota trading has yet to occur.<sup>lxxxix</sup>

The rules governing the division of Māori-owned quota poses challenges for smaller iwi and those with limited coastlines and the smaller quota packages held by these groups are generally 'uneconomical' as the quota share cannot obtain a market price that covers fishing costs.<sup>xc</sup>

Larger iwi, with fewer 'uneconomical' shares, are under pressure to mitigate fisher exclusion from ITQ system implementation, while simultaneously maintaining the broader and long-term benefits of the quota asset for non-fishers and future generations. This means iwi quota managers must work against the effects of two policies in New Zealand's ITQ system that – unintentionally – maintain processor control: the creation of Annual Catch Entitlement and the Licensed Fisher Receiver certification regulations. The government designed these policies to promote ITQ system monitoring. However, they also limit the extent to which iwi quota re-allocation initiatives can promote small-scale fishers' economic development.<sup>xcii</sup>

The QMS slows down development of new aquaculture species.<sup>xciii</sup>

Increasing demands from recreational fishing lobby groups who want a greater allocation of fish and a consequent reduction in the total allowable commercial catch (TACC) will come into conflict with the rights of commercial quota owners – including Māori – requiring greater dialogue and leadership from iwi and TOKM.<sup>xciiii</sup>

## Customary

The division between commercial and customary rights was based on the assumption that traditional Māori fishing activity was limited to subsistence use and the laws regarding customary fishing prohibit any fish from being exchanged for pecuniary benefit.<sup>xciv</sup> There have been several Court cases which have debated whether the sale of fish caught under customary licence and traded under a koha system fell within the definition of ‘sale’.<sup>xcv</sup>

While Māori were given the right to harvest fish for their own use under the customary regulations, the main purpose of these regulations is conservation rather than subsistence use and this has created an ongoing tension within the customary sphere.<sup>xcvi</sup>

These customary rights have also created tensions with recreational fishers, labelled as ‘bureaucratic racism’ by some opponents.<sup>xcvii</sup>

Restrictions on fish take under customary authorisations limit the realisation of the customary rights, as without the ability to sell their fish, those who might otherwise be customary fishers cannot afford to buy boats, fuel or gear in order to physically access the fishery.<sup>xcviii</sup>

Often iwi or hapū get members who are commercial fishers to obtain customary harvest while at work. This exposes the commercial operator to additional government oversight, and possible fines and creates potential negativity towards Māori fishers working as deck-hands on non-Māori owned boats.<sup>xcix</sup>

Exercising their rights can be difficult in the customary area. According to the relevant legislation, Māori are able to create two different forms of management area – taiapure or mataitai – and they are able to apply for two forms of customary rights – protected customary rights and customary marine title. Applying for any of these customary areas or rights is complex and requires a high degree of social and financial capital. While these vary in their legal power, the customary marine title provides Māori with the most entrenched and wide ranging authority. The thresholds a group needs to pass to be granted this title are difficult to meet and some applicants have experienced issues gaining recognition.<sup>c</sup> It is also the most difficult to get, with no applications granted to date.<sup>ci</sup> All of these customary areas and rights are contingent on the Crown’s decision, reducing Māori authority.

## Opportunities

Many iwi have overcome the fragmented quota by developing joint ventures (JVs) that have not only allowed them to harness the value of the quota but to also develop their own internal capacity. As these JVs progress more iwi will be able to actively fish their quota rather than leasing out the ACE.

TOKM has published a number of priorities for 2017-2020 that provide opportunities for the legal framework to be improved:

- Develop and promote options to improve marine management while recognising Maori fisheries rights, including those expressed through the QMS and the Aquaculture Settlements.
- Strengthen the QMS to ensure all sectors have an Incentive to take responsibility for their share of the Total Allowable Catch.
- Ensure policies on marine protection distinguish sustainability from preservation (which treats non-use as a form of utilisation).
- Ensure that where fishing is prohibited for reasons other than sustainability, Maori rights are protected or amended only by agreement.
- Ensure the customary fisheries framework is working for Iwi, hapu and whanau, consistent with the Deed of Settlement.<sup>cii</sup>

The creation of Fisheries New Zealand (FNZ) as a standalone directorate within MPI in 2018 marks a significant change in the regulatory environment. TOKM noted in their 2017/2018 annual report that:

“The establishment of FNZ was seen as a positive step for improving fisheries management and Te Ohu Kaimoana staff have undertaken regular engagement with our Crown counterparts. In line with the Māori Fisheries Strategy we have advocated for co-development of future fisheries policy in the spirit of partnership underpinning Te Tiriti o Waitangi. While FNZ has sought a more constructive relationship



with Te Ohu Kaimoana than existed previously, a full partnership and Te Tiriti-based co-development approach to fisheries policy still remains some way off at this time”.<sup>ciii</sup>

The 2004 Aquaculture Settlement means that iwi with a coastal rohe (area) would be entitled 20% of all new space.<sup>civ</sup> This represents a significant opportunity for these iwi, though the issues regarding setting up an aquaculture operation have been outlined above.

The importance of involving Māori at local levels was stressed by the interviewees and the greater empowerment of these communities would not only deliver improved environmental outcomes but also has a resonance with traditional Māori rights structures outlined above.<sup>cv</sup>

One major opportunity in the customary space is for iwi to use them as breeding grounds for commercial fisheries, using mātauranga and science to identify areas which would provide the best strategic outcome for wider fish stocks and seeking to place these in management areas or customary rights regimes. The success of Goat Island Marine Reserve, providing 11% of juvenile snapper in a 200 square kilometre area or 10 times as much as its size would otherwise deliver, shows how effective this method of repopulation could be.<sup>cvi</sup> Furthermore, the creation of these spaces could also be used to enhance marine tourism.

## Environmental

### Context

Mātauranga Māori provides a holistic and centuries deep repository of environmental information about marine species and ecosystems.<sup>cvii</sup> Much of this information lies outside the scientific paradigm and can complement this data.<sup>cviii</sup>

Māori typically follow a whole of ecosystem approach to environmental management encapsulated by the notion of ‘Ki uta ki tai’, or ‘Mountains to the sea’.<sup>cix</sup> It is clear that the way the land is used, and associated impacts (e.g. erosion and nutrient runoff), impacts what happens at the coast and at sea. Consequently, Māori place strong emphasis on understanding the land-sea interface and the interactions between them to identify optimal strategies for maintaining the mauri (health) of both systems.

Hāpua, or lagoon/estuarine environments are food baskets for Māori and offer many of the taonga species that underpin Māori stories, history and culture. These sit at the land sea interface and provide the recruitment grounds for many other marine coastal species. They are also locations for coastal Settlements, which bring unique sets of environmental pressures. Maintaining the mauri of hāpua through better understanding the land-sea interface is needed, in particular the management of farming (nutrients and erosion) and forestry (slash and erosion) practices.

### Problems

Criticism of the single species management approach used in the QMS is common among Māori operating in the MME. They argue that better understanding of the interactions between species (for example the predator-prey relationship between koura and rig), and optimal ways to manage species for abundance based on their interactions.<sup>cx</sup> However, such a change in regime would require modifications to the QMS and adjustments in allocations that do not disadvantage iwi or abrogate their Treaty rights.

In its 2019 report TOKM noted that Fisheries New Zealand made an independent call on the stocks to be reviewed and, as a result, some stocks have been included unnecessarily, while several others should have been included.<sup>cxii</sup>

As noted in the political section, while ecosystem-based management (EBM) has a number of similarities with the way Māori understand ecosystems in a holistic manner, EBM is also a management structure and there are concerns that the implementation of an EBM in New Zealand would see Māori lose some of the political gains made since the 1980s.<sup>cxiii</sup> The issue is that while most of the discussion around EBM is focused on the similarities in how ecosystems are viewed, there has been little work to date in examining and explaining what the management structures would look like. Environmentalism precedes political realities.

While mātauranga Māori can supplement scientific information about the environment it is not always viewed positively by the scientific community and some of this knowledge is being lost as generations die.

It was also noted by an interviewee that while Māori are actively including environmental concerns at the core of their operations many of the bigger fishing companies that dominate the wild catch sector do not operate in the same way and that this means it is not a 'level playing field'.<sup>cxiii</sup> This concern is magnified by the usage of Māori values in marketing by some non-Māori fishing companies.<sup>cxiv</sup>

## Opportunities

Virtually every Māori fishing company, from small fishers like Waikawa Fishing Company and Okains Bay Seafood through to big businesses like Ngāi Tahu Seafood and Moana have the value of kaitiakitanga at the core of their governance and operations.<sup>cxv</sup> Many of the improvements and innovations in the MME are driven by environmental concerns including the use of longlines and the development of Precision Seafood Harvesting, which both reduce bycatch. The majority of Māori fishing companies also operate above and beyond the current legislated environmental standards.<sup>cxvi</sup> There are also ad hoc, informal networks between actors in the MME, and often in specific quota management areas that engage in discussion about fish stocks.

Māori fishing companies need to put their resource management processes and high environmental outcomes at the forefront of their marketing. One interviewee noted the potential for aquaculture and restorative practices, noting that salmon farms in the Cook Strait add a lot of feed/nutrients into the ecosystem and this should be complemented by adding other restorative aspects, such as kelp, to utilize these extra nutrients and then using this in marketing to create a point of difference.<sup>cxvii</sup>

As outlined in previous sections, Māori highlight the need for decentralization of marine governance and management as a means of improving environmental outcomes. This includes areas such as data gathering, monitoring, reporting, and enforcement. This would allow the remaining mātauranga Māori knowledge about local ecosystems to be gathered and integrated into wider scientific datasets. Furthermore, local governance should include rural communities further up-catchment where land practice impacts ecological functioning in the coastal and estuarine environments.

## Climate Change

Climate change (CC) presents a significant threat to the MME generally speaking, with largely negative impacts predicted for many of the main commercial species.<sup>cxviii</sup> Of the top four species in the MME, koura, paua, snapper and hoki, which make up almost 50% of the total value, all but snapper are expected to be negatively impacted by CC.<sup>cxix</sup> In particular, koura and paua, which together equated to about a third of the total value, are both predicted to highly sensitive to both warming water temperatures and increasing ocean acidification, which will see habitats shrink and population numbers dwindle. There is a potential for snapper numbers to increase.

CC also presents a risk for coastal Māori communities, who are most likely to be impacted by rising waters and severe weather events and are often some of the poorest.

## SECTION TWO: KEY TRENDS, ISSUES, AND RESEARCH THEMES REGARDING THE MĀORI MARINE ECONOMY

Based upon the PESTLE analysis above 12 trends and corresponding issues for Māori operating in the marine economy have been identified and are summarised in Table 2 below. The analysis also reveals five research themes and corresponding research questions that are explained and summarised Table 3.

<b>Table 2. Key Trends and Issues in the Māori Marine Economy</b>	
<b>Trend</b>	<b>Issue</b>
<b>Kaitiaki Business Practice – Wild Fisheries</b>	
Māori are leading the movement toward sustainable fishing practices based on kaitiaki values in wild fisheries. However, sustainability is yet to be achieved.	Mātauranga Māori-informed pathways (the introduction and development of new technologies) are needed to support full transitions to carbon-neutral zero-waste (fully recyclable and biodegradable materials) fishing fleets, processing and packaging facilities, and distribution networks.
<b>Paths to Market – Wild Fisheries</b>	
Māori are leading the development of tracing technologies to provenance their product and communicate to their values to market. However, there is a reliance on orthodox supply chains.	Innovative market scoping is needed to identify alternative supply chain options and markets/communities willing to pay more for indigenous goods produced according to Māori values, worldview, and ethics.
<b>Property right enforcement – Wild Fisheries</b>	
Māori coastal communities play a significant role in monitoring and enforcing recreational, customary, and commercial property rights (i.e. identifying, reporting, and confronting illegal harvesting). This activity could be better harnessed and improved.	The development of online technologies (e.g. applications) to support the gathering and organization of information for use in enforcement and prosecutions would have strong local appeal and potential international value and relevance
<b>Alternative Species – Wild Fisheries</b>	
Māori own 30% of species in the ITQ by volume and 20% by value. This highlights that Māori own a number of species that are not currently commercially viable, but could be potentially.	Research is needed to develop technologies and approaches to commercialise currently economically unviable species.
<b>Multipliers – Economic Development</b>	
In the last three decades Māori, predominantly iwi, have focussed on building efficient and profitable corporations in the marine economy to provide dividends to their owners. However, whānau and hapū communities typically feel alienated from these entities. They are seeking tangible investments in	Indigenous development processes and structures are needed to bridge the corporation-community divide and encourage economic planning and investment with a focus on multipliers - in addition to the current focus on return on investment. In addition, research suggests that much innovation and development within the Māori marine economy is being driven by smaller private Māori companies,

their communities to generate employment, career opportunities, and other multipliers.	who feel they are competing with their iwi counterparts. Reducing this competition and generating mutually beneficial partnerships through new business models would also bring multipliers to Māori communities.
<b>Non- market Customary Economy – Economic Development</b>	
Some iwi have developed processes, technologies, and structures for facilitating the efficient and effective operation of customary fishing activity and economy. However, these innovations are occurring in isolation.	There is significant room to scope these innovations and extend them more broadly to other iwi, hapū, and marae komitis.
<b>Legal Personalities – Economic Development</b>	
Māori in the terrestrial estate have led the development of legal personalities for ecosystems and rivers based on whakapapa. Such legal structures provide the basis for alternative property right systems and markets focused on maintaining the mauri (health) of ecosystems. This indigenous concept could be extended to marine species and ecosystems and provide a basis for alternative property right structures and markets.	Research is needed to explore the development of property right systems and, in turn, economies based on legal personalities. Such design would give effect to indigenous worldviews and economic approaches.
<b>Mauri monitoring in Environmental Social and Governance (ESG) Accounting – Economic Development</b>	
Many businesses in marine economy are moving toward ESG accounting to report on the environmental and social impacts of their business activities. Māori have developed internationally unique and innovative approaches to environmental monitoring and accounting using Māori concepts such as mauri (life generating capacity).	There is potential to undertake research to expand and develop these initiatives for broader uptake within Māori businesses operating in the marine estate, and businesses in general.
<b>Investment Pathways – Economic Development</b>	
Māori entities are primarily invested in conventional assets within the Marine economy including wild fisheries; aquaculture with proven species; and marine tourism. Encouraging investment into areas outside of these proven asset classes into experimental areas entails significant risk. This risk needs to be reduced to encourage transitions to a blue economy.	Research investment with 20-year horizons is needed to understand and reduce technological, economic, social, and cultural risks.
<b>Governance Uncertainty – Economic Development</b>	
Blue economy transitions will likely require changes in the underlying property right and governance structures of the marine estate – for example the expansion of conservation areas and development of Ecosystem Based Management (EBM). These changes will impact on Māori property rights and jurisdictional issues, which is viewed by iwi and hapū as threats to their treaty rights and economic self-determination.	Any changes to current property rights and governance regimes must be cognizant of treaty rights and build treaty principles into their design.

Investment Transitions – Climate Change	
Māori are heavily invested in wild fisheries highly vulnerable to climate change. The impacts of these changes will be unevenly shared across Māoridom with some communities gaining and others losing.	Detailed research is required to inform the current investment decisions of Māori and to plan for future investment and cross-iwi/hapū asset distribution scenarios.
Land-sea Interface – Economic Development	
Māori have significant assets on both the land and sea. There are potential synergies between land-based activity and sea-based activity. These include the growing of seaweed for stock feed to reduce stock carbon emissions; the development of fibre-based packaging and biodegradable fishing gear; and the growing of feed for aquaculture.	Research is needed to identify opportunities in the land-sea interface between Māori land and sea based activities.

## Māori Research Themes

The analysis above reveals various areas where there are pressing research needs and opportunities regarding the MME. These include: the implementation of kaitiaki business practices; establishing paths to new markets; enforcing property rights; economically developing uncommercial quota species; establishing new economic and business models to encourage economic multipliers; developing and extending technologies for non-commercial customary fishing; the development of new property rights and markets based on legal personalities for ecosystems; the use of mauri-based ESG monitoring for business accounting and reporting; de-risking investment pathways for Māori entities to enter blue economy business opportunities; enabling climate change investment transitions; and exploring opportunities between land and sea production systems. These research needs and opportunities are interconnected and are grouped below under five research themes.

**Kaitiaki Business Practices** - The development of businesses models that fully embrace kaitiakitanga involves a full transition to carbon neutrality and zero waste. Such initiatives combine well with marketing, branding, and tracing initiatives, that aim to communicate key values such as kaitiakitanga and manaakitanga to markets willing to pay more such products. Furthermore, the ESG monitoring and reporting approaches provide means to authenticate business practices and provide market assurance to premium consumers.

**Community Tools** - The development of community-based property right enforcement mechanisms and the technologies and processes needed to support non-market customary economic activity.

**Transitioning and De-risking** - The development of economic multipliers through whanau and community-centred economic investments need to be developed and considered alongside Māori investments that will allow transitions from conventional to blue economy initiatives that are climate change resilience. In short, pathways need to be established that will give Māori confidence to invest in their whanau, hapū, and communities encompassed within unconventional and novel blue economy initiatives.

**Alternative Property Rights and Governance** - The fears Māori have concerning the impact of new governing and property right regimes on their economic autonomy and treaty rights fits with discussion concerning the development of legal personalities for ecosystems. Both of these issues are concerned with alternative governance and property right models in the marine estate.

**Research and Development** - The commercialization of uneconomic quota species involves research development processes that would be similar to the research development processes needed to develop products and technologies for land-sea production systems.

In the Table 3 below each theme is outlined along with the research questions associated with each theme.

<b>Table 3. Research Themes and Questions MME</b>	
<b>Theme</b>	<b>Research Questions</b>
<b>Kaitiaki Business Practice</b>	
The development of kaitiaki and manaaki centred business, marketing, branding, tracing, authentication, monitoring and reporting models.	<p>What technologies and processes are needed to support a full transition to carbon neutrality and zero waste across supply chains?</p> <p>What markets are seeking and willing to pay premiums for products from kaitiaki and manaaki centred businesses?</p> <p>What tracing, monitoring, reporting, and authentication systems can best communicate kaitiaki and manaaki centred values to market, and how might Māori concepts such as mauri underpin this process?</p>
<b>Community Tools</b>	
Developing practical tools to support Māori in the operation of customary economies and the protection and enforcement of commercial, customary, and recreational marine property rights.	<p>What technologies and processes can support coastal Māori communities in monitoring and enforcing marine property rights? How might they be developed?</p> <p>How might technologies and processes developed to support non-commercial customary harvest be improved and extended across iwi, hapū, and marae?</p>
<b>Transitioning and De-risking</b>	
Developing pathways to de-risk Māori investment transitions from conventional sectors into blue-economy and climate change resilient areas that capitalise on unrealized Māori assets and generate whanau, hapū, and community-centred opportunities.	<p>What risks and uncertainties preclude Māori investors from moving into unconventional blue economy initiatives? What information is needed to reduce uncertainty and encourage investment?</p> <p>What information is needed to support Māori entities to make current and future investment decisions regarding quota species vulnerable to climate change?</p> <p>What investment strategies produce optimal whanau, hapū, and community-centred economic opportunities?</p>
<b>Alternative Property Rights and Governance</b>	
Developing alternative property right and governing regimes that embrace Māori worldviews and approaches while maintaining treaty rights and obligations.	<p>What do alternative marine property right, governing, and management regimes look like that embrace Māori worldviews and approaches.</p> <p>In what ways do alternative regimes impact upon Māori treaty rights and economic autonomy?</p>
<b>Product Research and Development</b>	

Creating pathways for the commercialization of uneconomic quota species and the development products and technologies for land-sea production systems.

What uneconomic quota species Māori own have potential to be developed into commercial species. What is the pathway for their commercial development?

What are the opportunities in the development of land-sea production systems across Māori sectors? What is the pathway for their commercial development?

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