

MSc Sustainable Development: International Development

Utrecht University

Master Thesis: ECTS 30

**Power, Politics & Resources: A case study of the Marae
Moana, Cook Islands**

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Date: 07-09-21

Word Count: 17,684

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Abstract

Small pacific islands are dependent on the ocean as a means of sustenance and livelihood, yet they are also at the vanguard of climate change. Growing anthropogenic pressures on the marine environment are causing environmental decay calling for new and more drastic means of environmental management and conservation. Conservation is both an ecological as well as a social process, through MPAs certain actors may face exclusion from resources while others may not, this may also result in changes of power positions amongst different members in communities. This research explores the social dynamics of the Marae Moana, the world's largest multi-purpose marine park and how access to resources and power positions have changed since the implementation of the park. Through analysing policy, news articles and stakeholder interviews the research explores the complex landscape of stakeholders partaking in maritime conservation in the Cook Islands. Before delving into the stakeholder concerns and inter stakeholder dynamics, the research provides an overview of what activities take place within the Cook Island exclusive economic zone (EEZ) and actors are involved in the different processes of management.

The research finds that small scale operators benefit from the legislation while commercial operators face restrictions through having to operate outside prescribed exclusion zones. The research also finds that the government is trying to control the narrative on seabed mining through isolating critics like the environmental NGO Te Ipukarea Society (TIS). The Marae Moana Act does however provide TIS a tool in which it can hold the government accountable. The majority of community actors are in favor of the Marae Moana act, however there are various concerns regarding the practical aspects of the legislation. These concerns stretch from lack of compliance by foreign licensed fishing vessels, illegal fishing by unlicensed foreign vessels and lack of transparency by the government. Overall, the study concludes by arguing the Marae Moana is positive legislation for maritime conservation in a complex landscape of domestic and international actors working towards conservation in the Cook Islands, however there remains room for improvement regarding transparency and law enforcement.

Introduction

The ocean covers 70% of the globe and plays a significant role in sustaining life through various ecological processes. It is the largest carbon sink, provides at least 50% of global oxygen, drives weather and climate patterns as well as contributing to the diet of 3 billion people (Ocean Conservation Trust, 2021). Anthropogenic pressures such as pollution and overfishing have been threatening ocean health and those pressures are mounting as a consequence of an increasing global population calling for better means of management.

The concept of the exclusive economic zone (EEZ) was born out of the United Nations Conference on Law of the Sea (UNCLOS) held between 1976-1982. The EEZ is a maritime border in which a state has jurisdiction over 200 nautical miles off its terrestrial borders. This conception marked a change from laissez faire exploration of the ocean to one where countries had rights and responsibilities over their maritime areas. The establishment of EEZ coincided with countries adapting marine protected areas (MPAs) to conserve their marine environments from overexploitation (Kung, et. al, 20210).

Pacific island countries (PICs) are argued to be in the vanguard of climate change due to their reliance on the ocean and rising sea levels (Connel, 2015). PICs are rich in biodiversity both in terrestrial and marine environments. Due to their small and isolated geographic global positions PICs are dependent on their natural resources as a means of subsistence and livelihood. PICs are additionally politically vulnerable as the region is underdeveloped and their respective EEZ hosts vast maritime resources such as fish and valuable minerals (ibid). Some PICs are heavily reliant on tourism, including the Cook Islands, who receive up to 60% of their GDP from tourism, making the conservation of the idyllic environment particularly important (MFEM, 2017). PIC's environments are under various national and global pressures including habitat loss, pollution, coral bleaching and overfishing.

As of 2017, the Cook Islands have converted their whole 1,9km² EEZ into a multi purpose marine park called the Marae Moana. There are still unanswered questions due to limited publications by the Cook Island government and the recent implementation of the marine reserve, such as, the degree of community engagement in creating policies, what stakeholder perceptions, concerns and responsibilities and how was the balance between customary and non customary means of conservation met. In the context of being at the forefront of climate change and hosting vast natural resources, understanding how local debates are framed and positioned in comparison to global narratives and the politics behind resource management in the Cook Islands is an area of particular relevance.

This thesis will therefore explore how the implementation of the Marae Moana marine reserve changed access to resources and power positions amongst stakeholders in the Cook Islands by means of stakeholder interviews and secondary sources. The following section will address the theoretical framework surrounding resource management strategies and social aspects of maritime conservation.

Theoretical Framework

This section will explore literature on various concepts and theories relevant to natural resource management. These include existing literature on political ecology, local processes and stakeholders in MPAs and debate on customary and non-customary means of conservation. This section concludes by looking at how global processes such as international organizations and foreign countries may influence maritime exploitation in the Pacific.

Political Ecology & MPAs

Political ecology derives from environmental studies and is centered around power relations and the coproduction of nature and society. It politicizes ecology as opposed to treating ecology as apolitical. (Bryant & Bailey, 1997) assert that there are three interlinked assumptions in political ecology. These assumptions entail that political ecologists accept that environmental change has costs and benefits that are unequally shared by actors. This implies that social inequalities are either reinforced or reduced, which leads to changes in power dynamics amongst affected actors, thereby having political repercussions. Political ecologists understand that ecological decisions are influenced by politics on different scales, local decisions are influenced by regional politics and regional politics stem from larger global political narratives. Through understanding the political systems affecting ecological processes, political ecology aims to understand causes rather than symptoms of ecological problems, thereby looking for alternatives or adaptations to mitigate existing issues (Robbins, 2011).

Being social institutions, the success of MPAs depends on the engagement and compliance of stakeholders. The matter of creating stakeholder consensus is complex, as communities are heterogeneous and different stakeholders hold conflicting interests (Himes A. H, 2007). Managers of MPAs often fail to consult

relevant stakeholder opinions in the implementation of MPAs. (Jentoft et. al., 2012) argues that it is not the MPAs promises that affect how stakeholders view them, it is the images stakeholders have of the MPAs . An image can be defined as a representation of what people believe, what they believe could happen and what they think (MPAs) should be (Jentoft et al. 2010). MPAs are not politically neutral as they affect different stakeholders in different ways. People construct their images by relating what the MPA implies for them, and conflict may arise out of different images stakeholders may have of the MPA (ibid).

(Hogg, K., et al, 2017) highlights contrasting theories on stakeholder participation. The pro participation theorists take a bottom up approach and argue that stakeholder participation brings representation of diverse views and values, provides local knowledge, solutions tailored to the local context, creates legitimacy as well as help lay the groundwork for the implementation of policies. Those who oppose extensive stakeholder participation take a top down approach and argue that excessive stakeholder participation creates fractiousness and does not adequately address the scientific ecological issues in the preservation of resources.

Stakeholder opinions are a complex matter. Not only do stakeholders' views of what constitutes a successful MPA differ across different groups, they also may differ within the same group. (Himes, A. H, 2007) argues that stakeholders should come together and construct their unique definition of success by finding consensus on economic, social, biological and managerial components. The notion of consensus amongst stakeholders, especially in the early stages of creating the MPA is also highlighted as an important factor in a study by (Abecasis, R. C., et al, 2013). The study highlighted that amongst small islands there was a strong collective cultural connection to the marine environment as it contributed towards the aesthetic, lifestyle and cultural identity of the community. In spite of collective views on the value of the marine environment, stakeholders had varied views on what the threats facing the marine environment were. Furthermore, (Abecasis, R. C., et al, 2013) study suggested that inter-stakeholder trust enhances MPA resilience, as stakeholders are more likely to comply with MPA policies. This happens in part through creating a

common understanding of the purpose of the MPA as well as creating dialogue between stakeholders on scientific explanations for policies in the MPA, such as reasons as to why fish stocks are decreasing.

Tragedy of the Commons vs. Common Pool Resources

There are clashing theories with regards to how public resources are best managed. In the seminal piece named 'Tragedy of the Commons' by (Hardin, 1968), Hardin argues that in the context of population growth and rational self interest, public resources will eventually be depleted. This inevitable conclusion arises out of resources being finite, and without limits on individual use, the resource will be overexploited and be exhausted to the point where it can no longer be used by society. In Hardin's view, the only way to counteract the consequences of people over exploiting natural resources would be by limiting population, thereby consuming at a lower rate so that resources can replenish, or, by limiting access to resources, through for example privatization. Hardin's work on the commons has been reviewed and criticized by many, most notably, Elinor Ostrom, who extensively wrote about common pool resources (CPR). Ostrom published a book named 'Governing the Commons' in which she discusses and illustrates that people can self organize and self govern in a way that does not threaten the longevity of resources for local consumption (Ostrom, 1990).

CPRs are often managed by common property protocols. Common property protocols are carefully devised rules of engagement, which includes reaching a community consensus on how much of a resource is harvested, when the resource can be harvested and with what technology the resource may be harvested (Anderson, 1999, Ostrom, 1990). CPR entails that the resources are neither free nor public goods, and include mechanisms that grant access to community insiders whilst retaining the ability to exclude outsiders. Combined, these measures prevent the overexploitation of natural resources, allowing the community for continued access and benefits from controlled exploitation.

Ostrom's work on CPR created a paradigm shift, for, it had previously been widely assumed by economists that natural resources would eventually be depleted by their users. Ostrom's work earned her many prizes, including being the first woman to receive the Nobel Prize in Economic Sciences for her economic analysis of the commons (Nobel Prize, n.d.).

In spite of Ostrom's influential contribution to the field of CPR, the application of the theory has not always been as operational as some NGOs and other organizations had believed when working on implementing CPR projects. Due to Ostrom's influential work in the field of CPR, her theory has influenced policies adopted by large organizations including the United Nations, the World Bank and the Food and Agriculture Organization in the planning or implementing CPR projects such as community based natural resource management (CBNRM) programs. Saunders highlights challenges of implementing Ostrom's CPR framework that occur through oversimplifying local contexts in which the project takes place (Saunders, 2014). When organizations enter they treat what is a heterogeneous community as autonomous rational resource consumers with fixed identities with a common purpose, when in reality these communities may be associated with various network relations, with diverse agendas, influence and responsibilities (ibid). Ostrom's theory on CPR is unclear on how to operationalize varying social contexts, thus leading to organizations ineffectively applying or misappropriating Ostrom's CPR theory. Where Ostrom's theory originates from long enduring, endogenous institutions in managing resources, organizations exogenously apply Ostrom's principles to communities where such institutional structures and common social identity are less established (ibid). CPR and CBNRM is a common theme amongst PIC where an average of 80% of land is under customary community ownership (Keppel, et al, 2012).

Western conservation strategies are continuously developing based on experiences and perceived results. The fortress conservation strategy of isolating areas from local use through mechanisms such as fines and fences have been failing conservation efforts (Brockington, 2002). The continued failure has led anthropologists, marine biologists, conservation groups and

resource managers to advocate for integration of customary management practices such as CBNRM projects that include local communities rather than exclude them (Keppel, et al, 2012) .

Customary management systems can be defined as local practices that are designed to regulate the use, access and transfer of resources (Cinner & Aswani, 2007). Customary management systems are heterogeneous and thus, depending on the socioeconomic context, some strategies may be more effective than others. Customary management systems include, but are not limited to indigenous knowledge. Customary management practices consider indigenous ecological knowledge whilst also being embedded in customary land and sea tenure institutions. Indigenous knowledge may be defined as cumulative knowledge that takes form in beliefs and practices that are passed from one generation to the next (ibid).

(Lynch, et. al, 2010) notes that customary conservation is criticized as being informal, intuitive, and accessible than western conservation. Whereas western conservation is criticized as being reductionist, ignoring social elements, longer timeframes and taking specific focus on particular elements while neglecting the complex holistic interconnectedness of the ecosystem and human-nature relationship (ibid).

There has been interest in integrating customary management systems into modern resource management systems as customary systems are considered to be cost effective, especially in areas that lack regulation and where little data on fisheries and their activities exists. Though ownership does not necessitate conservation, it has been argued that ownership incentivises sustainable use of their resources as it is in their self interest (Cinner & Aswani, 2007).

Furthermore, customary ownership of sea and land may inhibit or complicate commercial developments, and in doing so, prevent the potential exploitation of such developments. The overall complex structure has proven to prevent resource extraction programs, however in some cases, due to fear of additional compensation, re-negotiations or changing claims, companies may feel incentivised to rapidly extract resources with little regard being paid to the environment, resulting in worse than normal environmental impacts (Duncan &

Duncan, 2007). The complex structure of customary systems relates to Ostrom's concept of CPRs in that they require the collective agreements of stakeholders through agreed upon conditions to avoid harmful exploitation of natural resources, and should an actor disobey the conditions, mechanisms are available to collectively confront offenders

Hybrid Systems

Pluralistic legal systems are also present in PICs. Pluralistic legal systems occur when a single population lives under multiple legal systems, in the case of PICs, there are customary laws and governmental laws. In the PICs of Fiji, Papua New Guinea, Solomon Island, Samoa and Vanuatu customary institutions have been integrated into national law creating a hybrid system. Customary management systems are vulnerable to changing socioeconomic transformations in the region, such as increased population growth, economic development and urbanization. (Cinner & Aswani, 2007) argue that the best hope for resource conservation will be a blend between customary and western practices. Due to the heterogeneity and complexity of customary systems as well as profound differences in intent and application, such congruence of two systems has been difficult to establish.

There have however been cases in which such a hybrid system has succeeded on a local level. Examples include tourism draws through introducing snorkeling, diving and touring in customary closure areas on the Cook Islands (Tiraa, 2006). Marine protected areas (MPAs) were created in partnership with local communities in Samoa and Vanuatu. In Vanuatu the trochus, a sea snail, had been overharvested due to its commercial value as buttons, inlay for furniture and jewelry as well as being an ingredient in some paints. The Vanuatu Fishery Department started a program to create a hybrid MPA that would help restock the trochus stock. The program was so successful in replenishing stock that neighboring communities adopted similar measures, as well as

communities extending protective measures to other marine life, such as the protection of turtles (Hickey, Johannes, 2002).

If designed correctly, hybrid systems respect traditions and utilize both indigenous ecological knowledge and scientific knowledge to help conserve the environment. (Hickey, Johannes, 2002) believe the reasons for success behind the hybrid MPA in Vanuatu, a small pacific island nation, were due to two main reasons. It was argued marine resource management required strong local leadership and village cohesion for marine resource management projects to work. Secondly, the project was targeted at biota that was of great local importance, trochus are a major source of income and sea turtles were an important source of food for the local community (ibid).

A study by (Keppel, et al, 2012) assessed six successful conservation programs across different PICs and attempted to string together factors that contribute to conservation success. The study found four prevalent conditions that were present in each successful project, namely, the active engagement and participation of leadership and land owning community, the tangible benefits for the community, involving all relevant stakeholders, and external support beyond 5 years. Chances of success were again increased when the community themselves initiated the conservation effort. Tangible benefits were not cash handouts, rather they were benefits adapted to local circumstances, for example scholarship programs for youth, locally managed ecotourism activities and access to fair trade certification for local cocoa production. Stakeholders varied depending on the type of conservation program but included actors like landowners, traditional leaders, NGOs, governments in spite of corruption being a known issue on PICs, and in some cases, businesses and development aid programs.

Commercial Fishing & Regulation

Since the introduction of UNCLOS 40% of the world's oceans became enclosed within 200 mile offshore EEZs, significantly reducing the size of high seas. Since this establishment, coastal states have more jurisdiction over natural

resources within their respective EEZ. With increased jurisdiction provided by UNCLOS also came increased management responsibility over those resources (Joyner, 1998).

These responsibilities entail determining the allowable catch of living resources, ensure those resources are not endangered by overexploitation, take into account management effects on non target species, promote optimum utilization of resources, determine capacity to harvest one's own resources and give other states access to any surplus within reasonable conditions (ibid). Notions like over-exploitation, allowable catch, capacity to harvest, surplus and effects of management measures are not standardized and can thus be open for interpretation and therefore be problematic, especially as an estimated 90% of all marine resources are harvested within EEZ of coastal states (ibid). The allocation of jurisdiction and management responsibilities of marine areas coincided with the emergence of MPAs to better conserve marine resources. MPAs have proven to be an effective means of conserving biodiversity, managing fisheries and conserving marine ecosystems. MPAs can result in economic benefit to fisheries by protecting spawning points and spillover of adult populations into extractive areas (Friedlander & Gaymer, 2021).

It is estimated that most fisheries and countries in the Pacific will not meet their food security needs by 2030 due to factors including population growth, decreased productivity due to climate change, poor distribution rates and overfishing. Conservation efforts have further been challenged through illegal, unreported and unregulated (IUU) fishing (Friedlander & Gaymer, 2021, Joyner, 1998). Coastal states also have the obligation to monitor, control and conduct surveillance and law enforcement on their EEZ. Surveillance may also be conducted on a regional level if coastal states choose to cooperate. Coastal states may lack capacity to monitor or prevent illicit actions by external actors within their own EEZ (Joyner, 1998). In the case of Chile, offshore island ecosystems are under strong legal protection however those remote areas are still vulnerable to IUU, local overfishing and other challenges due to surveillance and enforcement challenges (Friedlander & Gaymer, 2021). These surveillance and enforcement challenges have however been improved through

technological advances and international agreements to help ensure sustainable use and conservation (ibid).

In the event that an infringement of fishery agreement or breach of UNCLOS is detected, international fisheries law requires evidence of the act to be secured and the flag state to be notified. The flag state then decides if it will take enforcement action itself or authorize the inspecting state to investigate, should the inspecting state investigate, findings will be passed on to the flag state. Violations of fishery agreements stem from technological or administrative incapacities to enforce compliance, or from inadvertence (Joyner, 1998).

Foreign Interests

Foreign interests can also influence the means in which natural resources are exploited. Though small in size, some PICs are well endowed with natural resources such as timber, minerals rich seabeds and large EEZs for fishing. Regulation of fisheries is not isolated from international pressures; the EU, which has one of the largest most lucrative markets of fish, is attempting to influence fishery policy in the Pacific (Miller, et. al. 2014). Being the largest global tuna market, the EU has attempted to use its market power to attach regulatory conditions to its trade agreements and conditions of market access (ibid). The Pacific is also a region of interest to China, whose interests are twofold; gaining resources for its growing economy and seeking support in its interests in multilateral institutions like the United Nations. (Wesley-Smith, 2007). China offers PICs opportunities that are otherwise not available under existing structures of power and influence through large aid projects, concessional loans and natural resource backed loans and lines of credit. (Brant, 2013). The natural resource backed loans and lines of credit is a system in which a country can attract infrastructure loans from China for better commercial terms than otherwise available from commercial banks. In some cases existing natural resources exports are used as collateral or the loan may be contingent on a Chinese company receiving preferential access to natural resources, using the proceedings to repay the loan. PICs are becoming

increasingly economically entangled with China and have increasing reasons to avoid confrontation.

This paper aims at applying the concepts of maritime resource management, hybrid systems of environmental law and marine conservation and international influences to the Marae Moana marine reserve of the Cook Islands. The aforementioned concepts will be applied through a political ecology analysis that addresses different scales of power in different places and spaces, allowing for a better understanding of how the policies and power dynamics of the reserve affect the different stakeholder groups.

Conceptual Research Design

PICs are in the vanguard of climate change, maritime resources are becoming increasingly overexploited calling for new means of management. The Cook Islands have created one of the largest marine parks in the world called the Marae Moana, but literature on the marine park is scarce. How the means of management and conservation of maritime resources are exercised are subject to local and international politics.

3.1 Research Objective

The primary objective of this research is to investigate the social and political dynamics of stakeholders partaking in the Marae Moana marine reserve. This includes but is not limited to change in stakeholder power dynamics and power positions, perceptions, concerns and inter stakeholder dynamics.

Research Questions

The main research question that this paper proposes to answer is “**How has the implementation of the Marae Moana marine reserve changed access to resources and power positions amongst stakeholders in the Cook Islands?**”

To aid the answering of the main research question, the following sub questions will also be addressed in the research, namely:

1. How has the dynamic between customary and non customary maritime conservation changed through the Marae Moana marine reserve?
2. In what ways do different stakeholders shape and maintain the reserve?
3. What are the perceived results of the Marae Moana policies amongst different stakeholder groups?
4. What are the current inter-stakeholder power dynamics within the Marae Moana marine reserve and how have they changed since the implementation of the Marae Moana marine reserve?

Methodology

The research is qualitative in nature and utilizes both primary and secondary sources. A qualitative approach was chosen because the research aims at getting an in-depth understanding of culture and customs in relation to current practices as well as understanding the intricacies of domestic politics and international influences. The research collection took place across a 7 week time period between May-July 2021. The research aimed to piece together and understand different stakeholder experiences and perspectives on maritime conservation and different debates around . A stakeholder is defined

as people or organizations that are involved or affected by an action or policy and can be directly or indirectly included in the decision making process (Vogler, et al, 2017). Additionally to semi structured interviews with relevant stakeholders and participant observations, secondary sources were also utilized.

Methods of Data Collection

Policy Analysis & Secondary sources

The research included policy analysis of the Marae Moana Act 2017 by . Secondary sources such as scholarly articles, news articles and websites were consulted to aid the understanding of the Marae Moana and the contemporary political climate surrounding the maritime politics in the Cook Islands.

Semi Structured Interviews & Emails

The experiences and perspectives of different stakeholders were mapped through conducting semi structured interviews with relevant stakeholder groups across a 7 week period. These interviews were conducted in person with the consent of the participant. The specific stakeholders included fisherman, maritime tourist operators and government officials. Groups within the stakeholders were also distinguished as to identify varying priorities within stakeholder groups. Fishermen were categorized as either subsistence, artisanal and commercial. Maritime tourist operators were divided into charter fishermen and a marine eco center that also offers lagoon tours. Interviews with fishermen were conducted at the port of Avarua in the north of Rarotonga and Muri in the east. Post interview, snowball sampling was used amongst fishermen and maritime tourist operators to identify further relevant stakeholders. For government officials and NGOs, purposive sampling was applied to specifically target relevant people of interest related to the Marae Moana, these included members of the ministry of marine resources, Cook Islands Marine Surveillance Center and the Seabed Mining Authority (SBMA).

In some cases participants agreed to the interview but wished not to be recorded. Other participants preferred to answer questions over email, therefore emails were another method of gathering primary data from relevant stakeholders. A total 42 interviews were requested of which 33 took place. Of the 33 interviews conducted, 28 were recorded, 4 were written and 1 took place over email. For an overview of the interviews conducted, refer to table 1 on the next page which shows the quantity of interviews with different stakeholders, the type of interview as well as the contents discussed in the interview. All interviews have been transcribed and thematically categorized using a qualitative data analysis software called NVivo. Interviews lasted anywhere between 3 and 45 minutes, the disparity in interview duration can partially be explained by the availability of time of the interviewee and the proximity of the interviewee to the marine reserve, the closer associated the interviewee was to the marine reserve, the more they had to say on the matter. The ports were small in size, at the time of the research, Avarua port, the main port on Rarotonga, moored 18 boats, therefore the 25 interviews conducted with small scale fishermen was considered to be an adequate representation of fishermen perspectives.

Positionality also played a role in the data collection processes. Prior to introducing the research, many fishermen believed myself, the researcher, to be working for the government and were initially reluctant to discuss politics. The ports in which the research was conducted were small in size and across the 7 week time period in which the research was conducted, fishermen became increasingly familiarized with my presence and open to discuss their personal views. This familiarization over the 7 week time period allowed for a more honest account of peoples views. In some cases interviews were turned down as the prospective interviewee did not speak english and no translator was available.

Table 1: Interview Table

	Participant #	Interview type	Topics Discussed
Fishermen			
Subsistence	1-7	In person	Politics, practices, perceived results, concerns
Artisanal	8-20	In person	Politics, practices, perceived results, concerns
Commercial	21	Email	Politics, practices, perceived results, concerns
Government			
Ministry of Marine Resources	22-24	In person	Fishing licenses, monitoring, management strategies
Maritime Surveillance Center	25-27	In person	Law Enforcement, intergovernmental dynamics
Seabed & Mining Authority	28	In person	Sustainability, licensing, prospects
NGO	29	In person	Politics, indigenous practices, mining & fishing, concerns, inter stakeholder dynamics
Tourism Operators	30-33	In person	Politics, conservation education, indigenous practices
Total	33		

Research Strategy

This research aims at understanding how the implementation of the Marae Moana marine reserve has affected different stakeholder groups.

This paper applies a political ecology approach to understand power dynamics amongst different stakeholders of the Marine Reserve. Political ecology derives from environmental studies and is centered around power relations and the coproduction of nature and society. It politicizes ecology as opposed to treating ecology as apolitical. (Bryant & Bailey, 1997) assert that there are three interlinked assumptions in political ecology. These assumptions entail that political ecologists accept that environmental change has costs and benefits that are unequally shared by actors. This implies that social inequalities are either reinforced or reduced, which leads to changes in power dynamics amongst affected actors, thereby having political repercussions. Political ecologists understand that ecological decisions are influenced by politics on different scales, local decisions are influenced by regional politics and regional politics stem from larger global political narratives. Through understanding the political systems affecting ecological processes, political ecology aims to understand causes rather than symptoms of ecological problems, thereby looking for alternatives or adaptations to mitigate existing issues (Robbins, 2011).

The research will also include a temporal element to understand how power dynamics and access to resources changed since the implementation of the marine reserve. In the process of mapping the change of dynamics, variables such as customary and non customary conservation strategies, contemporary practices, community structures and inter-stakeholder dynamics will be explored. By highlighting the context in which the marine reserve takes place based on stakeholder experiences, successes and potential improvements may be highlighted to government officials in accordance with the Cook Islands plan of revising the efficacy of marine reserve policies in 2021.

The scope of the research was limited to the Island of Rarotonga in the Cook Islands. The research took place between May-July 2021. Interviews were not

conducted on the outer islands due to complications accessing the islands, some interviewees did however comment on the conditions of the outer islands. The study attempted to include all stakeholders of the marine reserve. The study did however not manage to interview international fishing vessels operating in the Cook Islands as they were restricted from docking in the Cook Islands due to Covid-19 restrictions.

Cook Islands

Before delving into the details of the results this section will provide background information on the Cook Islands. The Cook Islands is a small country in the Pacific Ocean with a population of 17,459 inhabitants. Rarotonga is the largest and most populous of the 15 Cook Islands, hosting over 13,044 inhabitants. All 15 Cook Islands only cover a land area of 240km², however the EEZ of the Cook Islands cover 1,962,700km² making it one of the world's highest ocean to land ratio countries in the world. According to the 2016 census Aitutaki has the second largest population of 1928 people, all other 13 Cook Islands have a population ranging between 0 and 500 (MFEM, 2017).

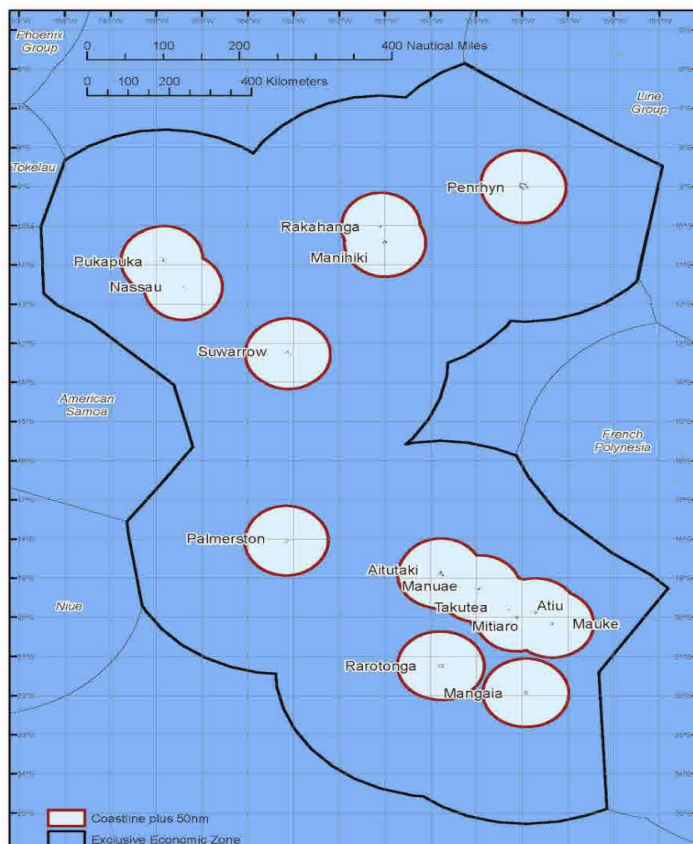
It is estimated that the first settlers arrived in the Cook Islands as early as 1000 AD (Chikamori, M, 1996). In 1888 the Cook Islands were under British protectorate until they were annexed to New Zealand in 1901. The 1915 Cook Islands Act claimed lagoon waters to be under government control, stripping formal traditional leaders rights over them. 50 years later, in 1965 the Cook Islands became politically independent and created the House of Ariki consisting of 26 members, Ariki being the term for a high chief. Later in 1972 the Cook Islands introduced the Koutu Nui, a statutory branch of 800 sub chiefs to help incorporate indigenous structures into government. The House of Ariki and the Koutu Nui had advisory roles but did not have legislative power. Western style of governance grew while traditional leaders lost their influence.

The Cook Islands were a former colony of New Zealand until independence in 1965. The two countries still have close political ties, for example New Zealand takes care of Cook Islands' defence and foreign affairs, and all Cook Islanders are New Zealand citizens. An estimated 80,000 Cook Islanders work and live in

New Zealand (New Zealand Ministry of Foreign Affairs and Trade, 2020). The Cook Island economy is heavily reliant on tourism with 60% of economic activity coming from the tourism industry (MFEM, 2017).

Historically the ocean has played a key role in sustaining life on the Cook Islands. Prior to western influence, the indigenous community on the Cook Islands had their own means of harvesting and managing marine resources. Today the marine environment still plays an important role in both nutritional sustenance and economic activity. A FAO study conducted in 2007 estimates that the average annual fish consumption in the Cook islands is 57.4kg with some outer islands consuming up to 219kg per person (FAO, 2010). In 2007 fishery exports constituted 79,4% of total exports coming from the Cook Islands (ibid). Recent studies have discovered that the Cook Islands also host vast volumes of precious mineral resources residing at its seabed across its EEZ.

Figure 1: Map of Cook Islands EEZ & Exclusion Commercial Zones



The black lines mark the boundary of the Cook Island EEZ. At the center of each red circle in figure 1 there is an island, everything within the red circle marks the island spatial plan, everything between the red circle and the EEZ marks the national spatial plan. This will be elaborated on in the following section.

Source:

https://imgs.mongabay.com/wp-content/uploads/sites/20/2019/04/30122115/3-government-announcement-50nm_Large.jpg

5.0 Results

The following section will discuss the findings of the research, starting with policy summary of the Marae Moana act and its origins, followed by indigenous means of conservation in the Cook Islands, commercial activity in maritime space as well as the political ecology surrounding the marine park. This section concludes by contextualizing Cook Islands domestic activities in more global processes.

Marae Moana Origins

The Marae Moana was a project envisioned in 2010 by a man named Kevin Iro, a former rugby player who approached the House of Ariki to find a way to better protect the ocean from environmental decay. The idea received bipartisan support in the government and began a 7 year consultation period in which different stakeholder groups were interviewed to include their considerations into the policy proposal. Former Marae Moana coordinator Jackie Evans won the Goldman Prize also dubbed as the Green Nobel prize, an esteemed environmental award for her work in setting up the Marae Moana across a 7 year period. This research period was funded by international NGOs like Oceans5 and Conservation International and who funneled funds into the Te Ipukarea Society (TIS) a local environment focused NGO in the Cook Islands. Oceans5 is an international funders collaborative in which philanthropists support ocean conservation, similarly Conservation International is a US based NGO that funds environmental conservation through scientific and policy expertise. Eventually the funding ran out and the progress made by TIS with the support of international NGOs was handed to the government who later implemented the research into policy creating the Marae Moana Act 2017.

Marae Moana Act 2017

The Marae Moana Act of 2017 lays out the various policies of the marine reserve. The act includes 7 sections covering preliminary matters, institutional structure of the reserve, policy and spatial planning of the reserve, scheduled marine-based activities, compliance with management measures, reporting, and general and miscellaneous provisions.

The purpose of the Marae Moana act is to “protect and conserve the ecological, biodiversity and heritage values of the Cook Islands marine environment” (Marae Moana, 2019a). This entails an integrated decision making framework to balance marine conservation with ecologically sustainable use of the marine environment. The latter ecological sustainable uses, refers to public enjoyment and appreciation, public education and understanding of the Marae Moana, economic recreational and cultural activities, and research relating to its natural, social, economic, and cultural systems and values. Another purpose of the Marae Moana is to assist in meeting the Cook Islands international responsibilities. These responsibilities include adhering to the Convention concerning the Protection of the World Cultural and National Heritage, the Convention on Conservation of Biological Diversity, and the UNCLOS. Protection of pelagic, benthic, coral reef, coastal and lagoon habitats are a central focal point of the Marae Moana. Thus, most large scale fishing activities are prohibited in the national spatial plan, seabed mining is also permitted under the conditions it is done in a sustainable way (ibid).

The Marae Moana act is guided by 9 overarching principles, namely:

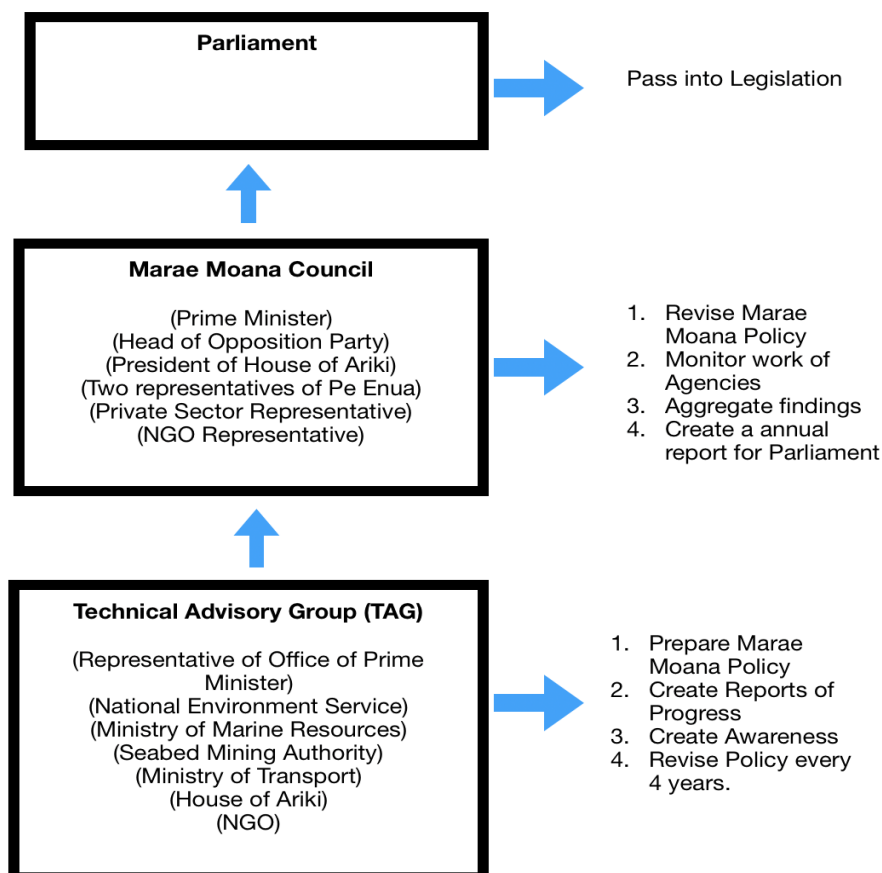
1. Principle of protection, conservation and restoration
2. Principle of sustainable use to maximise benefits
3. Precautionary principle
4. Principle of Community participation
5. Principle of transparency and accountability
6. Principle of integrated management
7. Principle of investigation and research
8. Principle of ecosystem based management

9. Principle of sustainable financing

Structure of the Marae Moana

The Marae Moana has a highly institutionalised structure where responsibilities are delegated into different groups. These groups include the Marae Moana Council, which includes the prime minister, the head of the opposition party, the president of the house of Ariki, the president of the religious advisory council, two representatives of the pe enua, a representative of the private sector and a representative of the non governmental sector. The responsibilities of this council are to revise and approve policy including the creation of spatial plans, monitor the work of agencies working within the reserve and finally, to approve an annual report that should be submitted to parliament.

Figure 2: Flow Chart of Marae Moana Structure



Additionally, as depicted in figure 2, there is a Technical Advisory Group (TAG) that consists of people appointed by the prime minister who represent different governmental bodies including the office of the prime minister, the national environment service, ministry of marine resources (MMR), seabed minerals authority, ministry of transport, House of Ariki, and non governmental bodies with expertise in environmental science, biology, ecology, oceanography or social welfare. The responsibilities of the TAG include preparing Marae Moana policy for approval by the Marae Moana council, evaluating and reviewing said policy every 4 years. Preparing and reviewing spatial plans for the various islands, comment on draft policies, raising awareness for the restrictions imposed by the spatial plans and managing measures through public education and promotional activities, preparing an annual report that records the activities and progress of the technical advisory group, as well as secure national and international sources of finance to support the purpose of the act. Discretionary functions of the TAG include educating the public within and beyond the Cook Islands to spread information on values, purposes, strategies and achievements of the reserve, invite outsiders with relevant skills, including Cook Island public organisations that are otherwise not represented by TAG to TAG meetings. Plan and undertake or support others to undertake scientific research that promotes the purpose of the act, recommend amendments to be made to any legislation or regulation to the Marae Moana council, and finally, investigate and pursue the designation of the Marae Moana reserve as a world heritage site.

Spatial Planning

The Marae Moana is divided into different zones which dictate what activities can and can not be exercised. The zones are divided into a national spatial plan and an island spatial plan. The island spatial plan extends 50 nautical miles (92,6km) radius from every Cook Island. The national spatial plan begins at the boundary of the island spatial plan, and extends to the boundaries of the exclusive economic zone (EEZ). Because protection of pelagic, benthic, coral reef, coastal and lagoon habitats are a central focal point of the Marae Moana, all extractive commercial activity is prohibited within the island spatial plan

boundaries. For an image of the different spatial divisions, refer to figure 1 on page 21. The next section will explore the different means of customary conservation in the Cook Islands.

Customary Means of Conservation

Indigenous practices are not as prevalent as they used to be, the assimilation into the globalized world through adaptation of technologies and modern ways of life have challenged customary institutions and practices. This has resulted in changes in means of fishing and the application of customary maritime conservation. This section will discuss indigenous means of maritime conservation and fishing in the Cook Islands.

Ra'ui

The customary means of maritime conservation is the Ra'ui. A Ra'ui effectively acts as a no-take zone for a designated area by declaring a resource tapu, or sacred, prohibiting all extractive activities. A Ra'ui can only be declared by a traditional leader. The application of a Ra'ui can be diverse, the Ra'ui may apply to only a specific species or all of them, it may last for a day, or last indefinitely, a Ra'ui can also be lifted for special occasions.

To date there are 4 Ra'ui around different sections of Rarotonga prohibiting all extractive activities. The Ra'ui is limited to traditional leaders' area of influence which extends until the reef. Fishermen were overall in support of the Ra'ui around Rarotonga, but were divided in their understandings of it. Some believed it was in place to support the fish stock around the island for fishing purposes. Participant 19 stated that by creating a no-take zone there is, fish don't stay within the Ra'ui, they move around and inhabit other parts of the reef and ocean where they can then be fished. Participant 15 believed the Ra'ui were in place to cater to the large hotels and resorts that could retain rich fish stocks for their clients to enjoy a better snorkeling experience. Participant 33 believed the Ra'ui was in place to prevent people from catching and eating giant

trevally which in Rarotonga have a bacteria called ciguatera, which can cause a form of food poisoning. The research found that small scale operators were in favor of the Ra'ui, but they had different understandings of it.

Elder fishermen believed that indigenous identity and values of Rarotongans have decreased over the years with less people interested in indigenous customs and practices. They also argued that the indigenous association still reigns stronger on other Cook Islands where government institutions are weaker and traditional leaders still hold more authority and influence. Participant 19 said that because outer islands were so remote, imported food prices were higher and that they were more dependent on local fish stock as a means of nutrition, and were therefore more motivated to keep their fish stocks high by applying Ra'ui (Participant 8). For example, on the island of Mangaia, there were multiple fixed Ra'ui in place around the island's waters, and several annually rotating Ra'ui, these would be lifted once a year for an annual fishing competition that lasts two days. The differences in cultural identity and the contemporary state of Ra'ui in Rarotonga compared to outer islands can also better be understood in the politics surrounding indigenous authority. Because Indigenous leaders lost authority through events like the 1915 Cook Islands Act, they hold less influence than they did before.

Although traditional leaders are incorporated in the Marae Moana policy, such as the leader of the house of Ariki being on the Marae Moana council and the House of Ariki being in the TAG, customary means of maritime conservation are not present in the Marae Moana. Traditional leaders do however have strong conservation-based opinions on the Marae Moana, one Ariki leader stated "we'd rather keep our fish for our people than sell it" (Marae Moana, 2019b). They also protested the renewed licensing of purse seiners in 2015-16, and advocated for larger exclusion zones around the Cook Islands. The Koutu Nui wanted an exclusion zone of 100 nautical miles, but eventually settled for 50. While one of the core principles of the Marae Moana reserve is conservation of marine resources, there is some concern whether seabed mining, purse seining and conservation can coexist. In Maori, the language of indigenous people in the Cook Islands, Marae Moana translates to sacred ocean. In spite of

compromising on their demands on the reserve, the Marae Moana is considered a good thing amongst local leaders as it can be seen as a modern equivalent of a Ra'ui, rooted in similar values as of the traditional system that strive for conservation and sustainable use (ibid). While traditional leaders do not have direct legislative powers and traditional means of conservation are not present in the Marae Moana, they continue to use the power that is given to them by the government to advocate for traditional values of conservation through formal channels like the Marae Moana Council and the TAG.

Customary means of Fishing

Customary means of fishing have been used for centuries but are now transitioning to more modern methods of fishing. There are many different means of customary fishing in the Cook Islands, the type of method used depends on what the target fish species is. Within the reef, methods such as gillnetting, cast nets, gleaning and a method using a baited handline called tiritiri are used. Outside the reef customary fishing practices include spear fishing, a method called titomo which entails using a baited hook on a line while diving and placing the bait nearby the target fish, and l'i which is a method of stone fishing which entails a hand line that, at the end has a baited hook tied around a rock and is dropped to the desired depth. Customary means of fishing are considered sustainable, in part due to the Cook Islands small population and due to the targeted method of fishing. Flying fish are considered a delicacy and are caught at night using a headlamp to attract the fish to the surface and then catching them with a scoop net. The materials used for fishing have also changed, traditional methods used fishing lines made out of vines and coconut fibre and hooks made out of strong wood, whereas today's fishing lines are made out of monofilament and fishing hooks are made out of stainless steel (Participant 31). The next section will discuss the contemporary state of fishing in Rarotonga and the Cook Island EEZ.

Fishing & Mining in the Marae Moana

The following section explains the two main forms of extractive commercial activity in the Marae Moana, fishing and mining. This section begins by introducing small scale operators before continuing onto larger commercial operators. Commercial activities such as fishing and deep sea mining within the national spatial plan boundaries are only granted after careful vetting by the Cook Islands government. This next section explains commercial fishing and mining in processes in detail and explores how the Cook Island government manages their maritime resources through licensing and enforcement.

Small Scale operators

Small scale fishing by local subsistence fishermen, artisanal fishermen and tourist fishing charters is permitted within the exclusion zone without any license. This is because the actions of small scale operators are considered to be within sustainable levels. As the laws of the Marae Moana do not directly apply to them, they are less informed about the reserve and its policies. Besides not fishing for sharks or turtles there are no restrictions on small scale operators. Although small scale operators argue that there are more fish the further out to the ocean you go, they do not leave the exclusion zone as their boats are too small and cost of fuel is too high. The main fish caught by small scale operators are mahi mahi, marlin, wahoo and tuna. The catch may depend on the season, mahi mahi and tuna can be caught around the year, while marlin are usually found from november to march, and wahoo are usually found between may and september.

There are different motivations to fish amongst small scale operators. Subsistence fishermen don't sell their catch, they keep it for themselves, and the excess is shared amongst family and friends. Subsistence fishermen have smaller boats than artisanal fishermen and also tend to go for smaller fish like mackerel and flying fish at night time, a Cook Island delacy. Unlike artisanal fishers, subsistence fishermen that don't own a boat may be fishing from the harbour using a cast net. Artisanal fishermen either have their own small shop in which they sell their catch, or they sell their catch directly to the tourism

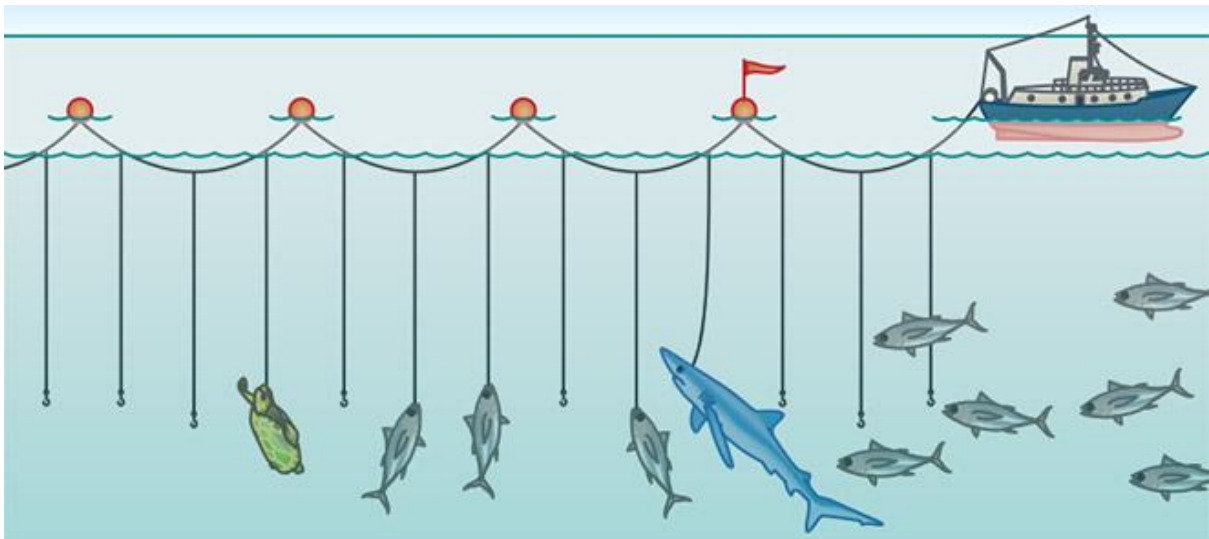
industry like hotels and restaurants . Fish is also quickly sold at the harbour by the kilogram, people frequent the harbour to see if there is any fresh fish for sale, and depending on the fisherman it may already be pre sold to hotels and restaurants. Similarly, fishing charters that take tourists out for a fishing trip split their catch between the tourist and the operating company, the company then sells their share of the fish at the harbour to recover operating costs like fuel and bait.

There is general consensus amongst small scale operators that fish stock has been decreasing. Participant 12 argued that fish stock have consistently decreased over the last decades, while participant 33 argued that overall the fish stock have been decreasing but since the implementation of the marine reserve fish stocks have started to recuperate a little bit. Participant 20 stated “I went out 4 times last week, but I only caught two fish, and with all the fuel costs, it is not worth it.” Small scale operators stated that Rarotonga was currently undergoing fish shortages, unable to provide restaurants and hotels local fish. This resulted in lower incomes for fishermen and hotels and restaurants not being able to cater certain seafood to tourists that would otherwise be available. With regards to the fishing storages, a representative of the local fishing club claimed that they had never experienced a similar situation (Fotheringham, 2021). Some believed this was a consequence of failed management by the government issuing too many fishing licenses to foreign vessels. Some fishermen are less worried about current shortages and argue that some years there is good fishing and others years it is not so good and that you just have to take them when they are there (Participant 11).

Commercial Fishing practices

Long line fishing entails setting a main line which has smaller lines with baited hooks attached to them as depicted below in figure 1. The lines can be set either at the surface or at the seabed, depending on which kind of species of fish is targeted. In the Cook Islands tuna, which originate close to the surface of the water is one of the main catches. There are no limits to the amount of hooks or to the length of the lines, resulting in commercial lines extending up to several kilometers.

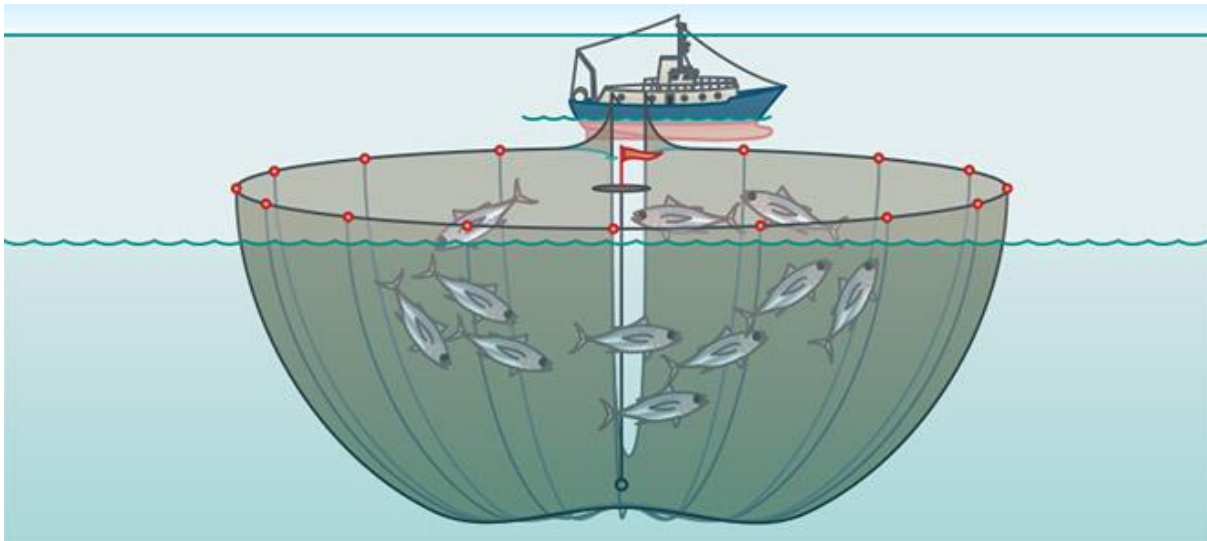
Figure 3: Long Line fishing



Source:

<https://worldoceanreview.com/en/wor-2/fisheries-policy/mangement/different-fishing-techniques-and-their-impacts-on-the-environment/>

Figure 4: Purse Seine fishing



Source:
<https://worldoceanreview.com/en/wor-2/fisheries-policy/mangement/different-fishing-techniques-and-their-impacts-on-the-environment/>

Purse seine fishing is when a boat casts out a large circular net with weights attached to the bottom and a buoyed top, catching all fish within the area as depicted above in figure 2. When spotting a school of fish, purse seine fishing has low levels of by-catch, however when used alongside fish aggregation devices (FADs), by-catch rates are a lot higher. Due to the efficacy of FADs, they are commonly used in combination with purse seine fishing. FADs are designed to attract pelagic fish, and there are different types of FADs, some are static and others drift. FADs also have varying levels of sophistication, they can be remotely accessed and can be equipped with sonar technology that allows for a better understanding of the groups of fish within the vicinity of the FAD. This technology allows boats to set FADs and chase whichever FAD gives the most promising readings for maximum catch.

Commercial Fishing Licensing

All commercial fishing is prohibited within the 50 nautical miles around all Cook Islands. Fishing licenses only began to be issued in the early 2000's and have since developed separate licensing for long lining and purse seining. The quantity of issued licenses peaked in 2012 and have since decreased. Between 2017-18 the Cook islands transitioned from having limits on the quantity of long line commercial fishing vessels licensed to a quota system that aims to keep fish stocks healthy by not extracting more fish than the quota permits. The government takes a precautionary approach by setting the annual quota limit lower than what the government deems is a sustainable rate of extraction. The main target species of commercial fishing in the Cook islands are predominantly albacore tuna, skipjack tuna, bigeye tuna and yellowfin tuna. Unlike long line fishing licenses, purse seine fishing are licensed per day. The Cook Islands have an annual limit of 1250 purse seine fishing days per year that can be purchased by clients. In 2020 the Cook Islands had 102 licensed commercial fishing vessels in its EEZ, down from 120 the previous year. The aggregated licenses earned the Cook Islands NZD \$8.6million, down from NZD\$13.5million the previous year (Samoglou, 2021).

Attaining a commercial fishing license to fish within the national spatial plan requires the prospective client to apply for a license with the MMR. The process to attain a license then involves the prospective client to create a proposal in which entails what fishing vessel they will use, what type of fishing they want to conduct, long lining or purse seining. The MMR then conducts background checks into the prospective client to see what their history is and to see if they are a reputable organization. If they get the green light from the MMR, the minister of fisheries then decides whether to take the client up on becoming a stakeholder in the Cook Islands waters or not. If granted permission, the client pays for the license they applied for. Additional protocols are in place to ensure conservation means, these measures include reporting catch and by-catch, adhering to other marine laws such as not catching sharks and turtles, not using

illicit methods such as tracewire, mounting a gps tracker to the vessel and occasionally having marine observers on board to oversee that laws are being adhered to. Due to covid restrictions preventing ships from docking, there are currently no port inspections nor marine observers on licensed fishing vessels. This lack of supervision and enforcement due to covid makes it easier for commercial fishing vessels to potentially break the law. Long line fishing licenses are valid for one year and clients must annually reapply to maintain their rights to fish. There are no limits as to how many licenses can be issued, the only limitations in place are via the quota system. The quota system on longlining and the limit on quantity of days for purse seining were in place prior to the implementation of the Marae Moana, the only thing that has changed is that commercial operators are now required to operate outside the exclusion zone.

Commercial fishing activity in the Cook Islands is strongly impacted by climate change, as tuna are migratory species, they move around the pacific ocean depending on temperatures and currents. Migratory behaviour of tuna in the pacific can be predicted by the El nino and la nina cycle. On La Nina years, fish are out further towards the west around the Solomon Islands and Papua New Guinea, while on El Nino years fish are out further to the east, around the Cook Islands. The cycle alternates roughly every four years, with the Cook Islands receiving more requests for fishing licenses during El Nino years. Due to the current La Nina conditions, tuna populations are westwards, resulting in lower requests for purse seining fishing licenses in the Cook Islands (Participant 22).

Cook Island Commercial Operator

The Cook Islands has one commercial fishing company called OceanFresh. OceanFresh sells their fish to both local markets and foriegn markets like Japan and the US. Since the implementation of the Marae Moana and its restrictions on commercial activity, OceanFresh has had to change how they operate. Prior to the Marae Moana, the exclusion zone for commercial activity was 24 nautical

miles. Now being 50 nautical miles the same means of long lining are not feasible anymore. Prior to the implementation of the Marae Moana, upon returning to Rarotonga from a fishing trip, OceanFresh would set their lines 24 miles offshore, return to land, refuel, restock, offload and return to their nets. Now having to commute an extra 25 nautical miles each way, the fish are on the line for too long in 26-28 degree waters making the catch go off by the time the crew arrives. The consequence of that is that OceanFresh now loses one day of fishing a week resulting in lower catch and must commute longer distances having an estimated annual loss of \$900,000 NZD. The company has unsuccessfully lobbied for exemptions to fish within the exclusion zone (Participant 21).

Commercial Fishing Regulation

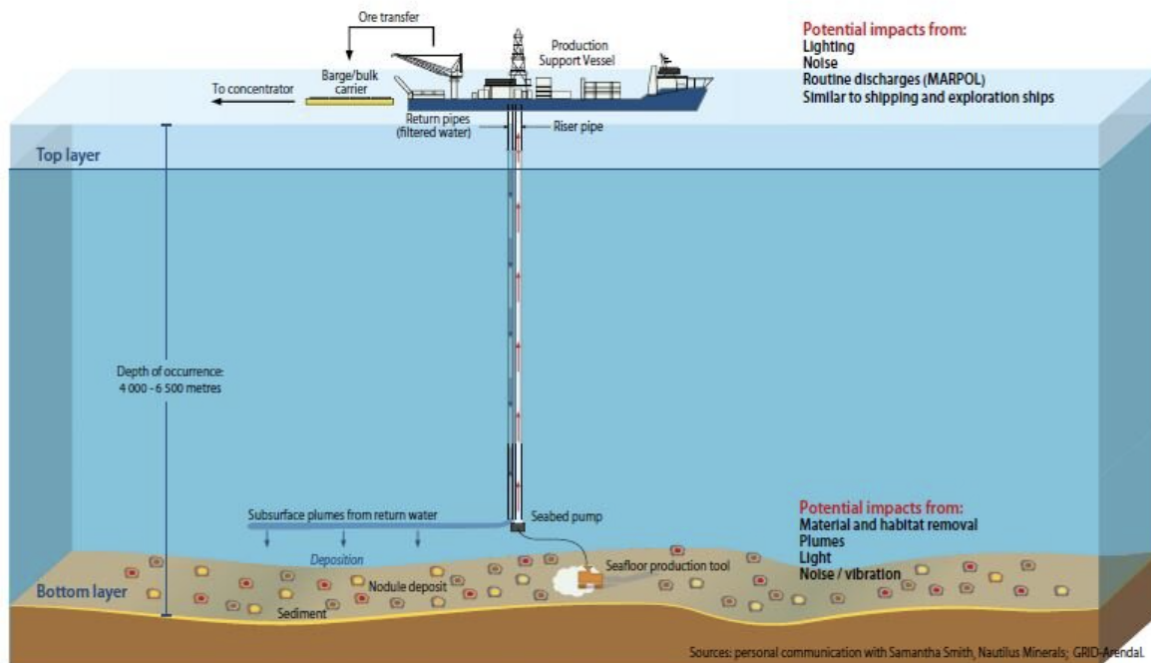
The MMR regulates commercial fishing through a marine control and surveillance system (MCS). All licensed vessels are equipped with gps trackers meaning their locations are recorded and can be traced ensuring vessels do not enter the exclusion zone. Boats are occasionally also manned by marine observers who are employed to ensure the fishing vessel is adhering to the terms and conditions of the license, such as declaring the correct catch and by-catch data. Then there are port controls where boats may be selected to see if the registered catch matched the catch on board. On occasion, there are arial controls conducted by New Zealand, Australia and the USA that may report unregistered boats in the Cook Island EEZ. The Cook Islands also have a maritime surveillance center which works with the MMR. If the MMR picks up suspicious activities on their trackers, they pass on the information to the surveillance center who may then send out a police boat to investigate the suspicious activity. If illegal activity is detected licenses are not necessarily revoked, evidence is submitted to the commission who then decides whether to prosecute or not. The minimum fine is \$100,000 NZD, and if multiple infractions occur the fines may be raised to \$250,000 up to \$1,000,000 NZD. If fines are not settled by the end of the year the boat becomes blacklisted, preventing it from fishing not just in the Cook Islands but also amongst regional partners (Participant 22). In 2017 the Cook Island government fined a Chinese flagged

fishing vessel \$140,000 NZD for illegally fishing in the Cook Island EEZ (Cook Islands News, 2017). The government has however not always enforced its own laws. In 2014 a Chinese vessel was caught with shark fins on board after a port inspection, and for an undisclosed reason the Cook Island government opted to talk with Chinese authorities instead of fining the vessel, this caused Cook Islanders to be upset as there was a clear breach of the law but no accountability (RNZ, 2014). The following section will explore the other significant but controversial maritime resource the Cook Islands hosts in its EEZ, precious metals in the form of manganese nodules.

Deep Sea mining in the Marae Moana

Deep sea mining is the extraction of minerals from the abyssal plain, the seabed that lies between 4,5-6,5km deep in the ocean. The seabed in the CI can extend up to 6,5km under sea level making it a complicated process to extract. The prime target of the seabed mining are accessing the manganese nodules that contain various minerals including cobalt, nickel and and copper. The Cook Islands is a unique case for deep sea mining as it hosts one of richest concentrations of cobalt in its manganese nodules globally (Kingan, 1998). Cobalt is an important element in the production of batteries, making it a metal of particular importance as electric vehicles become more prominent. Simplified, the process of extracting manganese nodules entails pumping seafloor sediment which includes the manganese nodules into a ship where they are then extracted, the residual sediment is returned to the ocean bed via a second pipe as depicted on the next page in figure 6.

Figure 6: Process of Deep sea manganese nodule extraction



Source: <https://www.sbma.gov.ck/phases-of-sbm-activity>

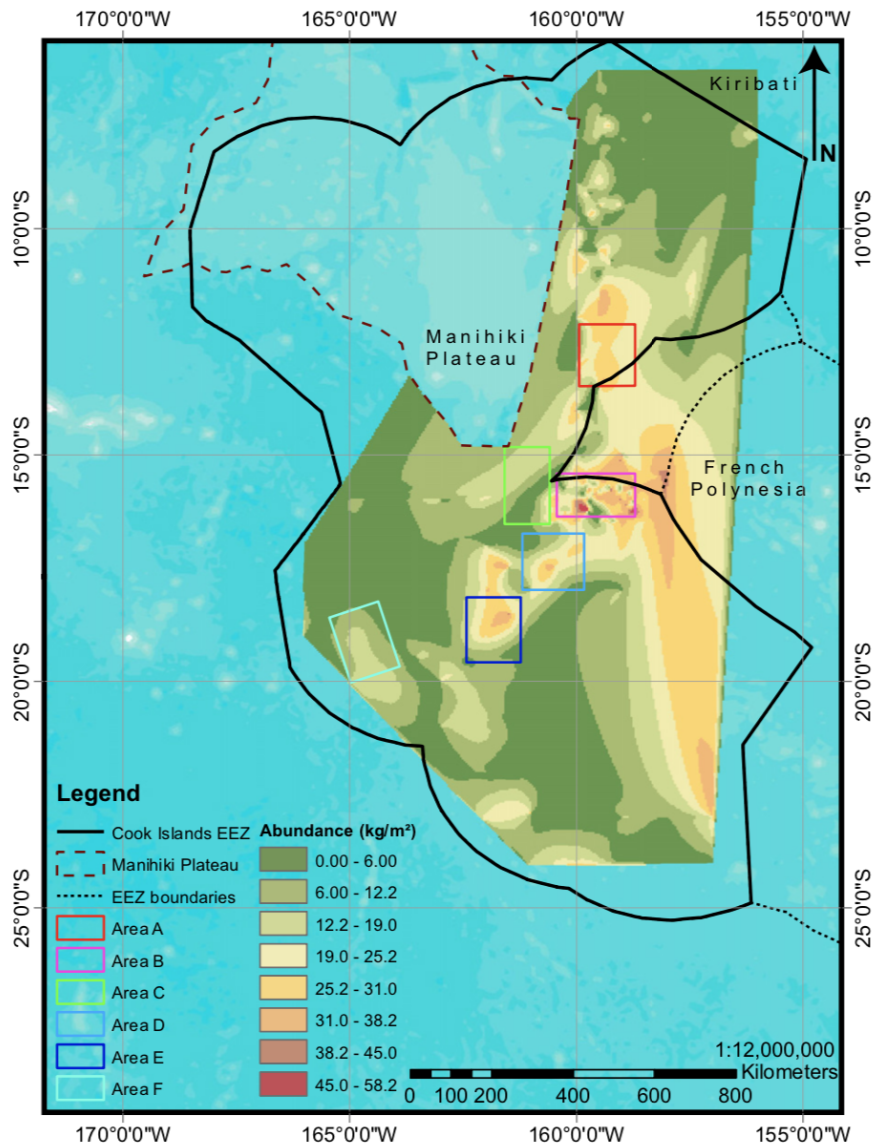
Under the Marae Moana act, deep sea mining is permitted in the national spatial plan under the right conditions. The government has a branch called the Seabed Mining Authority (SBMA) that is responsible for the issuing of licences and that the extraction of minerals happens in a sustainable manner. The Cook Islands is the first country in the world to regulate seabed mining in its EEZ (Participant 28). Deep sea mining in the CI is still in a prospective state, in October 2020 the government announced a competitive tender to let prospective companies compete for a contract. The license entails measures that once the license is issued, continued environmental monitoring is held, both during and after the extraction period. It is additionally important to note that deep sea mining is controversial as large scale deep sea mining operations have not been conducted and that the environmental repercussions are

therefore still not fully known. There are however projected impacts due to noise and vibration, light, plumes caused by discharge and removal of habitats.

Seabed mining outside the island spatial plan is permitted but to date has not been exercised. The potential economic value of deep sea minerals within the Cook Island EEZ makes it a lucrative business that the government wants to capitalize on. One study by (Pettersen & Tawake, 2019) estimates the total theoretical value of minerals within the Cook Island EEZ to be around \$12 Trillion USD with one ton of nodule being valued at \$1111 USD. The value is however only theoretical to the extent that commodity prices fluctuate. This large figure is due to the high concentrations of cobalt, nickel, titanium and other rare earth metals including molybdenum, niobium, vanadium, tungsten, and zirconium in the manganese nodules. Exploratory licenses to better understand metal concentrations of manganese nodules and their respective seabed have been issued. It is estimated that the Cook Islands host 10 billion tonnes of manganese nodules (ibid).

The government believes that seabed mining has the potential to contribute to social, environmental and economic well being whilst achieving the United Nations Sustainable Development Goals (SDGs). Although the Cook Islands does not have one of the largest areas in which manganese nodules can be found, it has one of the highest concentrations of nodules. This means that mining operations would cover less area than they would elsewhere in the world.

Figure 7: Manganese Nodule distribution in the Cook Island EEZ



The study by (Hein, et al., 2015) traced 6 areas of high manganese nodule concentrations. These are marked as 'Area A - Area F' on figure 7. Lower densities of manganese nodules can also be found and commercially mined outside the areas demarcated by Hein et al.

On a national scale, the extraction of sea bed minerals would bring job opportunities to Cook Islanders and would help diversify the Cook Island

economy, reducing its dependency on tourism. The study by (Petterson & Tawake, 2019) estimated that one mining operation that lasts 20 years could create 147 jobs for Cook Islanders, \$2.4 million going to local workers and up to 43.2M to the government annually, equating to a 15% increase in GDP. It is estimated that the Cook Islands could host up to 18-46 of these operations just within the high concentration areas marked as Area A - Area F in the previous figure. However to not over supply the market and minimize environmental and social damage, the government would limit its mining operations. At a rate of having one active 20 year mining operation within the high concentration areas A-F alone, mining operations could last between 360-920 years.

On a global scale, the extraction of precious metals such as cobalt, would contribute to the global energy transition towards renewable energy sources. The metals are also not single use, once extracted and manufactured into products, some of the metals can be reclaimed through recycling. The government is trying to educate the public on the benefits of seabed mining through hosting events, and distributing pamphlets. The government's agenda was made clear when attending one of their events, posters and pamphlets only highlighted positive things about mining with no attention to potential consequences. There are concerns of consequences, globally and nationally, TIS supports a 10 year moratorium on mining to better understand what is going on before commercial extraction takes place, these concerns will be elaborated on in the following section.

The government, alongside consultation of the public, decides if the mining is permitted or not. Before the mining proceeds, it will have to be proven that the mining will not affect the physical, chemical or biological integrity of the ocean (Marae Moana, 2019c). The process to attain a license for seabed mining is more complex than attaining a commercial fishing license. Simplified, the process entails the prospective partner must submit their application to the SBMA who then undergoes due diligence on the applicant. If the applicant passes this phase, the SBMA passes on the application and consults other relevant government agencies including the national environmental service and the Marae Moana council. After this phase, a licensing panel which entails a group of independent experts review the application and report to the minister of

SBMA and cabinet, either recommending going through with the licence or recommending to decline the license. The minister and cabinet then have the final say.

The Canadian start-up Deep Green is the main actor involved in obtaining rights to mine in the Cook Island EEZ. They have since merged with Sustainable Opportunities Acquisition Corporation and renamed themselves to The Metals Company. In a statement The Metals Company stated that mining on land nor in water is not sustainable, but the path to sustainable metals is acquiring enough metal stock in order to recycle rather than mine (Woody, 2021). The Mining Company downplays impacts of deep sea mining by saying the abyssal plain is a marine desert and one of the least inhabited places on earth and its mining operations would be “the lightest planetary touch” (ibid). While The Mining Company wants to appear as having environmental interests in mind, big NGOs like Greenpeace are sceptical of DeepGreen stating “They’ve (DeepGreen) thrown on a green cape and say all the right words, but their sole intention is to make money” (ibid). The next section will continue with looking into the political ecology of the Marae Moana.

Political Ecology of the Marae Moana

This section explores the complex landscape of stakeholders involved in the Marae Moana. It discusses perceived results, change in power dynamics, access to resources and concerns of parties involved. The section concludes by discussing inter stakeholder dynamics and how power relations have changed as a result of the implementation of the Marae Moana.

Perceived Results Amongst Small Scale operators

While small scale operators are aware of the Marae Moana, they are not too informed on its implications as the laws do not affect them directly. Those that are aware of the policies of the Marae Moana welcome the changes brought by the Marae Moana, they benefit from the policy as they no longer have to compete in the same spaces as commercial actors who use large nets to catch their fish. There are however still concerns amongst small scale operators in regards to overfishing by commercial actors, safety of marine observers and illicit fishing. Small scale operators believe the government issues too many fishing licenses for too cheap of a price, resulting in lower fish stock.

Participants 12 and 15 said after paying the licence fee of \$100,000 NZD foreign boats get tuna at \$0.16 NZD a kilo while in store the tuna costs \$20 NZD a kilo. There is also concern that too much fish is leaving the Cook Islands, the fish caught in the EEZ by foreign boats are destined to foreign markets not having any benefit for Cook Islanders. There is also concern of having to indirectly compete with commercial vessels. In spite of commercial vessels now having to fish outside the exclusion zone, the fish have migratory behaviour depending on water temperatures and currents, so even if commercial operators fish outside the exclusion zones, they effectively intercept the fish from entering the exclusion zones.

Furthermore, small scale operators also have concerns regarding the regulation and enforcement of the Marae Moana policies, Participants 3, 16 and 17 said they know somebody who lives on one of the outer islands who witnessed large commercial fishing vessels fishing within the exclusion zone. They believe commercial vessels turn off their GPS trackers, enter restricted fishing areas and then turn the trackers back on once they exit the exclusion zone. There is also concern amongst small scale operators that if commercial operators are caught breaking the rules of their license, the government does not follow through on the prosecution. Participant 3 stated: "There is so much stuff going on in the shadows, it's hard to know what's going on. Sometimes things are just swept under the rug, or they claim prosecution has occurred, but they can't make the details of the prosecution available to the public, they can't tell you

how much we fined them or why we didn't take the shark fins off their vessel.” Another argued that the reason behind the low number of prosecutions of illicit fishing activity was that China receives special treatment as they provide aid to the Cook Islands. Small scale operators also floated their concerns of corruption within government departments, they could not prove these allegations but it still presented distrust some fishermen had towards the government. Though they could not prove current corruptive activities their distrust is rooted in past events. In 2016 Teina Bishop, a former MP and minister of marine resources was caught accepting bribes from a Honk Kong based company in exchange for 18 fishing licenses (Cook Island News, 2016).

Another criticism of maritime enforcement were the conditions of marine observers. Marine observers are occasionally placed on international fishing vessels to make sure the laws are adhered to. Participant 16 claimed that they have a friend who is a marine observer, and that once on the ship, they feel a lot of pressure from the crew and sometimes even fear for their own lives resulting in them not reporting illicit activity. The fear of marine observers are not unfounded, since 2010, 10 fishery observers in the pacific have died on duty, the majority of cases were considered as being suspicious circumstances (Hawkins, 2020). Small scale operators also stated that there are foreign fishing vessels without a license that hover close to the Cook Island EEZ and illegally enter and fish before leaving again.

Small scale operators had divided responses regarding seabed mining, the majority of which were uninformed and did not have an opinion. Participant 12 stated “I don't really know much about the seabed mining in all honesty, I think it should just be left the way it is, we don't really know what the effect it will have. But if we're in debt and then, we can give them a bit and tell them to get out” Some participants were in favor, with participant 11 stating “if it's done in a sort of environmentally friendly way, it could be a good thing for us”. Participants were largely uninformed as there were limited resources available to them to learn more, this resulted in participants having fragmented opinions on the matter.

Commercial Operators

OceanFresh Cook Islands' only commercial fishing company shares many concerns of small scale operators. OceanFresh was not consulted prior to the implementation of the Marae Moana and bears the brunt of the marine reserve's policies. They had stark objections towards the Marae Moana claiming nothing good had come out of the implementation of the marine park. Beside monetary loss for their business, due to less time fishing and longer commutes, they also claim that their crew are experiencing more fatigue from having to work longer to reach the exclusion zone. Like small scale operators, they claim that in spite of the exclusion zones being created, the fish stocks are still decreasing due to the increase in international fishing licenses issued by the Cook Island government. Like small scale operators, OceanFresh believes that existing regulation of commercial activity is insufficient as they too believe foreign boats are engaging in illicit practices like fishing within exclusion zones. Like small scale operators, OceanFresh believes that the licenses are being sold for too cheap, bringing little benefit for Cook islanders. Furthermore, OceanFresh argues that the Marae Moana is commercially ineffective for Cook islanders as locals do not receive any of the fish that is harvested by foreign boats, sometimes resulting in fish shortages on Rarotonga. Due to the aforementioned reasons OceanFresh have been spending years lobbying national and different island governments for a dispensation for the Marae Moana restrictions. These efforts have however been unsuccessful.

NGO

The Cook islands have one local NGO advocating for environmental rights called the Te Ipukarea Society (TIS). TIS was arguably the founder of the Marae Moana reserve itself, in 2015, because at the time, the donor NGO, Oceans5, was unable to give money to the Cook Island government, TIS was able to receive the funding to put the project into action. Eventually however, the money ran out and the project was then transferred to the office of the prime minister. TIS argued that this was somewhat inevitable as they themselves had no

legislative powers to implement their proposed policies. Overall TIS is satisfied with the Marae Moana as the prime objective of the reserve is conservation. In spite of TIS having an overall positive stance towards the Marae Moana, they still have some concerns.

TIS has been advocating for the implementation of video cameras on commercial fishing vessels in the Cook Island EEZ. They argue that video surveillance would be an additional layer of security, making sure fishing vessels are not engaged in illicit activity, but also for the safety of marine observers on board. Foreign fishing companies have however opposed this idea. In regards to fishing TIS has been advocating against the use of FADs in combination with purse seining. Purse seining usually targets a school of one type of fish, but in combination with FADs, there are now many schools of fish resulting in higher rates of unwanted bycatch. Because the FADs are equipped with fish finders, commercial fishing vessels can remotely check FADs and follow the FADs that give the most promising readings. The damage is amplified when FADs are dispatched in large numbers. “What made it unsustainable was the combination as it attracts fish to the fads. Fishing without FADs you might find one school of fish, but with FADs you get all those species and you catch all of them. We don’t have a problem with local FADs ... they (commercial vessels) drop up to 100 FAD out and track them, some FADs might get lost and they might lose 600 dollar FAD, but they may also get a 200,000 dollar school of fish here” (Participant 29).

TIS also has concerns in regards to seabed mining. TIS called for a moratorium on seabed mining until the consequences are better understood. Because manganese nodules only grow at 1cm every million years, any mining thereof would be difficult to do at a sustainable rate. TIS believes that although the Marae Moana officially stands for conservation with sustainable use, the government is making sustainable use the main thing. “They don’t know much about conservation because they haven’t done the work to know what the impacts are going to be. They’re not cautious, they’re not using the precautionary principle. They’re saying we reckon we can do the seabed mining with minimal impact on the environment, we think we can still use drifting FADs

with minimal impact on the environment. But I don't think they have the research to be sure” (Participant 29). And due to these reasons TIS fears that the government might go as far as amending the Marae Moana act to have its way for seabed mining.

Government

The government prides itself for the Marae Moana, not only did the Marine Park showcase the Cook Islands on the international stage, it is also considered one of the largest commitments by a single country to ocean conservation (SPREP, 2018). Conservation and sustainable use is at the heart of the Marae Moana act, the former Marae Moana Coordinator, Jackie Evans, stated: “For us this is a long term investment for our people, we know it is bigger than us, it’s about leaving a legacy in place that will help us all in the long run, and if we want to do it well, we must do it right” (ibid).

The government believes the Marae Moana is a good thing as it is a step towards better managing their marine resources . Though the government has not conducted an environmental impact assessment on the commercial fishing in their EEZ, they work with an intergovernmental organization called the Pacific Community (SPC). The SPC is an intergovernmental organization involving 26 predominantly PIC governments and focuses on providing technical and scientific advice, SPC also acts as a conduit for development projects from other nations (SPC, 2015). The SPC covers a whole range of topics ranging from social issues like education, health and human rights to environmental issues like agriculture, fisheries and climate change. The SPC has been recording data including marine observer data and catch data provided to them by different Pacific governments. According to the MMR, the West Pacific fisheries are one of the best managed fisheries in the world (Participant 22). Tuna stocks are in reasonably healthy condition and the Cook Islands charge a relatively high price of 0.16 NZD a kilo for their tuna, allegedly more compared to their Pacific neighbours. The SPC records annual catch rates and monitors the health of tuna across the Pacific since 1960, the latest 2019 publication indicates that

albacore, bigeye, skipjack and yellowfin are all in healthy condition. The SPC report shows that the total tuna caught by commercial fisheries in the western and central pacific has been steadily increasing from 265,249 metric tons in 1960 to 2,997,309 metric tons in 2019 with the purse seine fishing being the most popular means of fishing, accounting for 70% of all catch in 2019 (Hare, et. al., 2020). The MMR also noted that the current shortage of fish stock in its EEZ is not due to overfishing, but rather due to environmental factors like fish migratory patterns. The MMR shares some concern with small scale operators that illicit fishing occurs in their waters. The MMR believes that some unregistered boats linger on the periphery of the Cook Island EEZ, sometimes entering to fish before exiting to the high seas, outside Cook Island jurisdiction (Participant 22).

The government is also strongly in favor of seabed mining. It argues that the pacific region is at the forefront of developing a sustainable deep sea mineral mining based on the precautionary principle and good governance. The benefits thereof being not just for Cook Islanders, but also for the global energy transition towards greener technology (SBMA, 2020). The government continues to advocate the overall benefits of seabed mining through hosting events to local and international audiences.

Inter-Stakeholder Dynamics

Inter-stakeholder dynamics of the Marae Moana are multifaceted and complex. The relationship between TIS and the government has always been complicated. TIS handed the Marae Moana project over to the government once it ran out of funding to continue the project. TIS has however stayed a very active partner in the dealings of the marine park. TIS has always been advocating for the conservation of natural resources on the Cook Islands, this at times entailed taking the government to court on issues in which TIS believed the government was falling short of its legal responsibilities of upholding the

Marae Moana legislation. For example TIS took the government to court due to damage related to expansion of the fisheries and the use of FADs, though the government won the first case TIS appealed and won the appeal. TIS effectively holds the government accountable to its pledge of sustainable use and conservation it pledged in the Marae Moana act. Therefore the Marae Moana Act provides TIS with a powerful tool to hold the government accountable to its own promises of protecting its marine resources.

TISs relationship with the government has also faded since the implementation of the Marae Moana. TIS played an active role in the implementation of the Marae Moana as well as in its early stages, having meetings and consultations with the government. Today TIS finds itself increasingly isolated from government affairs, meetings are less frequent and at times is not being invited to certain meetings and events. TIS believes the changes happened after the now former Marae Moana coordinator, Jackie Evans, stepped down. Jackie Evans bridged relationships between the government, not just with TIS but also other enterprises like an eco & wildlife center educating people about the customary practices, value of the ocean as a resource and the importance of conservation. These relationships fell apart when Jackie Evans was fired from her position and replaced by Maria Tuoro. Jackie Evans was fired from her position due to her support for a 10-year moratorium on seabed mining. Another factor that separates TIS from the government is that TIS advocated for a moratorium on seabed mining, something the government is trying strongly to push forward due to its lucrative economic prospects. Due to their differences in views and TIS decreasingly being invited to public Marae Moana events, TIS has started their own events in which they aim to educate people of all demographics on ocean health, including the potential consequences of seabed mining.

OceanFresh operates entirely independently from all other major Marae Moana stakeholders, they do not communicate with small scale operators nor are they a part of government consultations. They unsuccessfully lobbied Island governments for an exemption to fish within the exclusion zone. Since the

increased restrictions placed onto OceanFresh, they now have a lower supply of fish and thus provide less to restaurants, hotels and locals. This shortage is somewhat filled by small scale operators who now claim a larger market share. Small scale operators have their own agreements with different hotels and restaurants. Fish is in high demand in the Cook Islands, people frequent the harbour and try to buy fish from small scale operators, however often fish is already pre sold to restaurants and hotels.

Inter-governmental institutions work together to shape and maintain the marine park. Not only do different ministries work together to issue licenses and regulate the marine park, they also record and submit annual data in a report to the Marae Moana Council, who then aggregates all findings into one report destined for the parliament. In spite of submitting its data to the Marae Moana council, the MMR claims it does not work more closely with other government agencies since the implementation of the reserve.

Different parties within the government have however not always been cohesive in their views. Former Marae Moana coordinator Jackie Evans won the Goldman Prize also dubbed as the Green Nobel prize, an esteemed environmental award for her work in setting up the Marae Moana across a 7 year period. Jackie Evans was removed from her position shortly after she supported a 10 year moratorium on seabed mining. The head of the opposition party in the Cook Islands also sits on the Marae Moana council, and although the party initially supported a 10 year moratorium on seabed mining, they have since changed their stance in support of it, the reasons behind why they changed their position are unknown, but welcomed by the governing party.

Cook Islands & International Affairs

Being a small PIC with a population less than 20,000, the Cook Islands are constrained by limited capacity to fund their own operations, consequently relying on the international community for support. The most notable donors to the Cook Islands are New Zealand and China. The Cook Islands are heavily reliant on tourism, and over 61% of tourists are from New Zealand. New Zealand provides an estimated 66% of Cook Islands development assistance, focused predominantly on building capacity in public health, education and tourism (New Zealand Ministry of Foreign Affairs and Trade, 2020 & RNZ, 2019a).

The Cook Islands does not have its own military, it did however receive a marine surveillance vessel alongside a marine surveillance center from Australia in 1989. Australia donated 23 vessels to its pacific neighbors for them to conduct surveillance in their own EEZ. In 2022 it will return the vessel to Australia in exchange for a newer one that allows for longer trips, making its surveillance of the Cook Island EEZ more effective. This vessel is the only police vessel available to the Cook Islands and is in charge of patrolling the 1.9 million km² EEZ. Because the Cook Islands does not have a military, the Australian government also deploys an officer to oversee the surveillance operations. The reason behind the donation is that Australia can look out for its own interests, intercepting suspicious maritime activity such as trafficking and illicit fishing.

China has provided concessional loans and different infrastructure projects to the Cook Islands. In 2020 it received \$20 million USD from the China backed AIIB development bank after a lone request from another development bank fell short (Barrett & Menon, 2021). Chinese aid has however not come without controversy. In 2017, China promised to upgrade the Cook Islands water infrastructure, it was the largest infrastructure plan the Cook Islands has received in decades. After it's completion by Chinese contractors, the Cook Island government deemed it to be sub standard resulting in 17km of pipeline having to be replaced and a legal dispute between both parties (RNZ, 2019b).

Chinese government linked organizations also own one third of Cook Islands NZ\$215 million external debt (Barrett & Menon, 2021).

Through the implementation of the Marae Moana, the Cook Islands is also looking to do its part in meeting its international responsibilities. For example, under the Convention of Biological Diversity, member states are committed to protecting 10% of coastal and marine areas by 2020, and with the exclusion zones of each Cook island 16% of the Cook Islands EEZ is protected. It is furthermore adhering to the laws outlined by UNCLOS to create a framework to manage its EEZ. This framework entails the UNCLOS listed criteria of having allowable catch, ensuring resources are not endangered by overexploitation, adequately monitoring and managing non target species, promoting optimum utilization of resources as well as determining its own capacity to harvest its own resources and sharing access to surplus resources with other states through the issuing of foreign fishing licenses. Furthermore, the SBMA is framing seabed mining ambition in the context of SDGs that contribute to the global narrative of development, framing the mining to be a positive progression for domestic development and international development towards a carbon free society.

Discussion

Marae Moana translates to sacred ocean and the Marae Moana Act 2017 was created to help protect the ocean from environmental decay. The actors involved in the 7 year implementation period were TIS and the government, with TIS receiving funding and advice from international NGOs like Oceans5 and Conservation International. In the implementation phase TIS consulted different members of the public to include their interests in the policy proposal. The research found that fishermen both artisanal and commercial were not a part of this consultation, thereby excluding their potential contributions. This is reflected in the Marae Moana Act which does not directly involve small-scale fishermen

and restricts the operations of OceanFresh and other commercial actors. It is difficult to gauge the degree of participation in the implementation of the program as there may have been other parties that were consulted that the research did not identify. However it can be said that more fishermen should have played a larger role in the pre implementation consultation as they are direct stakeholders of the reserve and hold relevant knowledge that could aid in efforts to conserve marine resources. The consultation of OceanFresh could have additionally been important as they also play a role in shaping and maintaining the reserve through compliance to its policies.

The main research question of the thesis was how has the implementation of the Marae Moana marine reserve changed access to resources and power positions amongst stakeholders in the Cook Islands. In the process, customary and non-customary means of conservation, contemporary practices, stakeholder perceptions and inter stakeholder dynamics were explored. The results indicate that commercial activity, specifically that of OceanFresh, experienced the largest change in access to resources, through the restricted access due to the implementation of the new exclusion zones. OceanFresh bears more operational costs in longer commutes and working hours resulting in less fishing. The implementation of the marine park has offset some of the pressure on small scale operators making it a progressive policy. Although they face pressure from commercial fishing vessels, they now do not compete for fish in the same spaces as commercial operators. In spite of these changes, small scale operators are still concerned about decreasing catches. The government however argues that fish stocks are healthy and contemporary shortages are due to environmental factors. Since the 1915 Cook Island Act indigenous leaders have lost legal authority of the lagoon surrounding Rarotonga, proving a power shift from indigenous authorities towards formal governmental authorities. Indigenous leaders retain some power by being included in formal governmental processes such as the Marae Moana council and the TAG. Though indigenous leaders are still represented in the government through the House of Ariki and the Koutu Nui, indigenous means of conservation were not present in the Marae Moana, but were approved by indigenous leaders as it shares the same philosophy embodied in indigenous

practices, conservation and sustainable use. The power dynamics between TIS and the government have also changed since the implementation of the Marae Moana. Although the TIS and the government have a history of quarreling over environmental issues, TIS is finding itself increasingly isolated from positions of influence. This is largely due to their objection against deep sea mining and change in position of the Marae Moana coordinator.

The isolation of TIS can be interpreted as a political power play by the government to aim to control the narrative on issues like deep sea mining so they can follow through with their agenda with public support. Deep sea mining offers vast economic potential for the Cook Islands, and because it is a new means of resource extraction, the consequences thereof are not fully known. However due to lucrative prospects of deep sea mining and the touting of its benefits to local and global audiences it can also be derived that the Cook Islands is looking to go through with issuing a mining license once the adequate research has been completed.

The findings showed some inconsistencies with the guiding principles listed in the Marae Moana Act. The results show a pattern of concern regarding fish stock amongst small scale and commercial operators. The government has not conducted their own environmental impact assessment, but based on intergovernmental organizations like the SPC who collect regional data and monitor fish stock, tuna populations are in healthy condition. This however does not address what the fish stock of marlin, mahi mahi and wahoo are like, all target catch species of small scale operators. This lack of overview also extends to enforcement issues. There is shared concern by TIS, OceanFresh and small scale operators that international fishing vessels operating in the EEZ are not complying to the Marae Moana laws. This is however hard to prove or disprove, especially during the period in which the research took place, covid-19 restrictions prevented certain enforcement protocols to take place like having on board marine observers and having port inspections of goods. Regardless of covid-19 restrictions, there is room for improvement regarding the principle of transparency and accountability. Transparency and trust could in part be achieved through new technology. TIS has been advocating for the implementation of video surveillance on commercial operators however those

ideas have been rejected for undisclosed reasons. Having on board camera surveillance deter illicit behavior, add a layer of security to marine observers and provide evidence to improve transparency and accountability.

There are different discourses on the issue of deep sea mining. Due to the novelty of seabed mining, TIS supports a 10 year moratorium so the environmental impacts can be better understood. The government claims it is taking caution by having an extensive licensing system and claiming it would only proceed if mining will not affect the physical, chemical or biological integrity of the ocean. The government is increasingly controlling the narrative by decreasingly inviting TIS to public events and excluding potential consequences of mining at these events, focusing rather on the prospective opportunities it would provide. It is clear the Cook Islands can economically benefit from allowing deep sea mining to take place, however there are still unanswered questions of how the benefits of the mining would be redistributed beyond on site employment.

The hypothesis was that the reserve was a CBNRM program that restricts commercial exploitation through a combination of customary and non customary means of conservation. The research proved that although commercial activity has been restricted through exclusion zones, the Marae Moana is more government orchestrated than community driven. The community did however benefit in that civil society organisations like the NGO TIS now have a legal framework on which they can challenge the government if they believe their actions breach the boundaries of sustainable use. Furthermore indigenous values regarding conservation are present, but indigenous means of conservation are not. As a whole, although tools of accountability have been added through the legislation, the Marae Moana proved to be more of a non-customary and top-down governed project than hypothesized.

Due to the infancy of the project and the remoteness of the Cook Islands research on the Marae Moana is limited. The research provides new insights into the social and internal dynamics of the Marae Moana on a national and international scale. The research shows how Cook Island government

approaches its management of natural resources through its different ministries as well as some community perceptions and politics surrounding those management systems. In spite of challenges identified throughout the research, the Marae Moana is a significant move towards sustainable management of maritime resources. Being legally bound to the goal of conservation and sustainable use, the government created a framework for limiting commercial activity to levels that do not impede on the needs of future generations.

The findings share similarities and differences with existing literature. The Marae Moana is not considered to be a CPR due to its top down means of management. However the legal pluralism of the Ra'ui system shares resemblances to CPR in that although the Ra'ui is not legally binding from a government perspective, people still view it as a positive thing for the maritime management in the Cook Islands and therefore abide by its restrictions. (Cinner & Aswani, 2007) recognizes hybrid systems of customary and non customary of conservation are effective tools for resource management and Customary means of conservation are vulnerable to economic growth and urbanization. This corresponded to the research as people on Rarotonga had fragmented understandings of the Ra'ui as customary means of conservation faded due to growing government influence, yet due to their different positive perceptions of it they chose to abide by its restrictions even though they are not legally binding.

The research is different from other studies in that restricted activities only apply to commercial actors in a space that is not physically accessible by the community. Yet the activity within these inaccessible spaces have spill over effects on the community, on the livelihood of local commercial fishermen, artisanal fishermen and tourism industry like fishing charters and restaurants and hotels through limited fish availability.

As Jentoft correctly identifies in his research, MPAs are not politically neutral. Because the Marae Moana does not restrict the activity of small scale operators, they are not well informed on the other policies of the act. This plays into Jentoft's notion of stakeholders images of MPAs as Jentoft argues stakeholder perceptions of MPAs depend on what the reserve implies for them.

Because commercial operators are directly affected they have a different image of what the Marae Moana is and what it should be. These differences in images of the Marae Moana are also present with regard to TIS and the government. Where the government has its own framework of defining what is sustainable and what is not through quota systems and consulting experts, TIS has different views by advocating against FADs used by purse seiners and calling for a moratorium on seabed mining. In line with Jentofts research, these differences in stakeholder images of what the MPA should be, lead to conflict, in the case of TIS and the government a legal dispute.

(Himes, 2007) and (Abecasis et., al, 2013) highlight the importance of stakeholder consensus in MPAs, particularly during the early stages in creating an MPA. None of the fishermen interviewed in this study were a part of the Marae Moana consultations and their understanding of the Marae Moana was limited. Of what knowledge small scale operators did have, the Marae Moana was viewed as a positive legislation towards conserving the environment. (Abecasis et. al, 2013) added that stakeholder may have differing opinions with regard to what the threats to the environment are and elaborates on the notion of trust in MPAs by stating that inter stakeholder trust enhances MPA resilience through better interstakeholder communication and understanding scientific reasoning of policies leading to better compliance. The results showed that there was clear inter stakeholder consensus amongst small scale fishing operators, commercial fishermen and TIS with regard to the threat of the environment, namely overfishing and non compliance by international fishing vessels.

According to (Abecasis et al, 2013) inter stakeholder trust could be improved by providing scientific explanations behind policy. The results suggested that communication between government and small scale operators was limited and not rooted in scientific reasoning. For example, in response to concern of small scale operators in regards to low fish stock, the government responded it was due to 'environmental factors' instead of explaining how la nina and el nino cycles affect fish migratory patterns in the pacific. Trust could additionally be created by implementing camera surveillance on board of licensed fishing

vessels to create another layer of security. This would both further incentivise vessels to comply with prescribed laws and give the Cook Island government an additional tool to improve law enforcement.

The research found that there were different perceived threats at different scales. On a local scale fishermen perceived threats caused by overfishing and IUU fishing on local fish stock. These findings were aligned with the findings of (Friedlander & Gaymer, 2021) and (Joyner, 1998). These perceived threats were however not shared at a national level, as the MMR argued that fish stocks, particularly tuna stocks were in healthy condition and that law enforcement within its EEZ is in a good state. The research differs from other studies in that licensed vessels are a perceived threat to local fish stock through non compliance to prescribed laws. This finding is however in line with Friedland & Gaymers finding that remote areas of a state's EEZ are particularly vulnerable to IUU fishing due to complexities regarding surveillance. Surveillance issues in the Cook Islands are amplified through having one of the highest ocean to land ratios in the world, with one policing vessel to patrol the 1.96million km² EEZ. These surveillance challenges are being combatted through regional alliances who help patrolling the Cook Island EEZ and technology such as GPS tracking.

Prior to 1989, when Australia gifted the patrol vessel and the Marine Surveillance Center to Cook Islands, there was no means of conducting surveillance of the Cook Island EEZ. Today the Cook Islands works with other regional powers to enforce national and regional interests in the Pacific. It's maritime policy is also nested in international treaties like UNCLOS and Convention of Biological Diversity. The Cook Islands are a small resource rich country that in many ways depend on larger powers. It received surveillance support from Australia as well as New Zealand and USA who occasionally provide aerial monitoring. It receives management advice from intergovernmental organizations like the SPC and NGOs like Oceans5 and Conservation International. It also receives loans and infrastructure aid from foreign countries like China.

It is beyond the scope of the research to address the contemporary state of fishing on islands other than Rarotonga. Furthermore, due to covid restrictions there were no international fishing vessels docking in the Cook Islands therefore they could not be interviewed. The research could have further benefited from having a more in depth governmental perspective beyond the positions of different governmental ministries. There was an attempt to interview the current Marae Moana coordinator, but the request was turned down. On paper the Marae Moana Act 2017 appears to be a progressive legislation that benefits small scale operators and restricts commercial exploitation. Due to the novelty of the Marae Moana Act and the lack of available data, it is too soon to comment on if the legislation is effective at sustainable managing its maritime resources. There are still knowledge gaps that remain to be explored, these include the status of fish other than tuna, a deeper understanding of customary perspectives, the distribution of benefits from potential seabed mining and a better understanding of the positions of international fishing vessels operating in the Cook Island EEZ. A better understanding of the aforementioned factors would provide an even more holistic understanding of the social dynamics and effects of the Marae Moana.

Conclusion

The ocean plays a crucial role in sustaining life on our planet, and is especially significant to PICs like the Cook Islands who depend on the ocean as a means of substance and livelihood. PICs are at the vanguard of climate change and with growing anthropogenic pressures on the maritime environment new and more drastic means of management are required. Though conservation is targeted at ecological processes, it has political implications as it affects different stakeholders in different ways. Through qualitative analysis of policy, news articles and stakeholder interviews the paper aimed to research the change in power positions and access to resources as a consequence of the Marae Moana Act. The research uncovered the complex landscape of domestic and international stakeholders involved in maritime management in the Cook

Islands. The research found that all parties except for the commercial operator OceanFresh were in favor of the legislation as they were restricted from operating within the 50 nautical mile exclusion zone. In spite of nearly all parties being in favor of the legislation, there were various concerns surrounding the practical aspects. Small scale operators and OceanFresh shared concern of IUU fishing, non compliance of foreign licensed fishing vessels and lack of enforcement and transparency by the government to hold perpetrators accountable. With regards to power positions, OceanFresh and foreign commercial fishing vessels have lost power through the implementation of exclusion zones and small scale operators have gained power by not directly competing in the same spaces as commercial actors. The research also found that seabed mining hosts a promising economic opportunity to diversify the Cook Island away from its tourism driven economy, however given the novelty of the industry there remains uncertainty surrounding its environmental impact. Due to supporting a moratorium on seabed mining TIS have lost power through finding itself increasingly isolated from governmental processes and thereby playing a smaller role in contributing to the narrative regarding conservation. The Marae Moana Act does however benefit TIS power position by providing a legal foundation in which it can challenge the government if it believes the government is falling short on its legal duty of protecting the environment as prescribed in the act. How the Cook Islands navigates the uncharted waters of seabed mining and where it draws the line between sustainable use versus conservation remains to be seen.

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