Image courtesy of Open Ocean - Whakatōhea Mussels Ōpōtiki Ltd

The contribution of Kānoa-administered government funding to Aotearoa New Zealand's Aquaculture Industry

ALLEN + CLARKE

Document status:	FINAL
Version and date:	V.6; 22/11/23
Author(s):	Marie Nissanka, Brendan Stevenson
Peer / technical review:	Robyn Bailey, Ned Hardie-Boys
Verification QA changes made:	Marnie Carter
Proof read:	Carly Cummins, Marie Nissanka
Final QA check & approved release:	Marnie Carter, Project Sponsor

TABLE OF CONTENTS

Table of Tables

Table of Figures

1.0 EXECUTIVE SUMMARY

This report documents the contribution of Kānoa-administered government funding for a selected sample of funded projects in the aquaculture industry from 2019-2022.[1] This mixed-methods study incorporated qualitative interviews, a survey, a document analysis, and focus groups (both online and through an in-person wānanga). Contribution Analysis is used as a theoretical framework to determine the contribution of the funding from the qualitative data. Below is a summary of the key findings related to the contribution of the Kānoa-administered government funding scheme to Aotearoa New Zealand's aquaculture industry. This report is organised according to the following questions:

1. What outcomes were realised?
2. When were the outcomes realised?
3. Were there unintended consequences?
4. Which projects benefited the most and least?
5. What investments were most effective for Māori?
6. What implementation practices were most effective for Māori?
7. Has the Kānoa-administered government funding improved the aquaculture industry?
8. What could be improved to ensure sustainable growth?

1. What outcomes were realised?

The Kānoa-administered government funding yielded the following attributable outcomes:

I. **Increased employment**: The Kānoa-administered government funding significantly boosted employment in the aquaculture sector. The Cawthron Institute's National Algae Centre, backed by a $2 million grant, created jobs focusing on high-value algae compounds for various applications. Whakatōhea Mussels in Ōpōtiki experienced rapid growth, employing 181 people by July 2022, and Te Whānau-ā-Apanui received a $6 million grant, creating 17 jobs for a mussel hatchery and research hub. Refer to 5.1.1.

II. **Effective training and development:** In Ōpōtiki, workforce programs were integrated into the harbour development project, addressing skills gaps and ensuring locals were qualified for aquaculture jobs. Whakatōhea Mussels invested in training, offering programs like the Tūāpapa Foundation Course and seafood processing

[1] The sample was selected in consultation with MBIE and refined based on the consent obtained from project organisations.

apprenticeships. They partnered with the New Zealand Academic and Learning Institute (NZALI) for literacy and numeracy training and enrolled crew members in the Toi Ohomai Institute's Advanced Deckhand Qualification. However, these initiatives faced challenges due to the COVID-19 pandemic's disruptions. Refer to 5.1.2.

III. **Promoted innovation and secured intellectual property:** Whakatōhea Mussels is pioneering open-ocean mussel farming with innovative strategies. They exceeded greenweight tonnage expectations despite fewer mussel lines and expedited facility commissioning. Environment Southland focuses on sustainable aquaculture practices, improving salmon feed and supporting eco-friendly initiatives, enhancing industry sustainability. CH4 Global tackles livestock methane emissions using Asparagopsis seaweed, aiming to reduce emissions significantly. Their funding support aids research and development, fostering innovative methane reduction with collaboration across communities and institutions for maximum impact. These initiatives contribute to environmental goals and economic benefits. Refer to 5.1.3.

1.1 Challenges

However, there have been some challenges with achieving these positive outcomes. These include:

- High staff turnover within Kānoa leading meant that some research participants found communication disjointed.
- Capacity issues affecting iwi project management and incurring additional time spent on project management.
- Community-driven projects finding resource consent costs high.
- Some found the management of public opposition to projects laborious.
- Perceived short-term government funding cycles sometimes hampering long-term planning by councils and non-government organisations.
- Insufficient resources hindering workforce development at Ōpōtiki District Council.
- Aquaculture-sector-specific issues, such as:
    I. shortages in juvenile salmon
    II. transitioning to hatchery technology
    III. bridging the gap between research and commercialisation
    IV. enabling polyculture research

Notwithstanding these challenges, the funded projects in this report displayed resilience and continued their progress. Refer to 5.1.4.

2. When were the outcomes realised?

The outcomes of Kānoa-administered government funding have been realised at various stages of the funding life cycle, which was dependent on project maturity and complexity. The main points are summarised below:

- The funding during the pre-investment phase facilitated resource allocation for business planning and project management.
- Infrastructure project funding, particularly in 'shovel-ready' initiatives, contributed to employment, labour, and material demand, benefiting regional economies.
- More research focussed projects, such as those led by the Cawthron Institute who host the National Algae Research and Development Centre, benefit regional economies in multiple ways and at different time-points.
- Growing expertise and experience that is shared with or informs other regionally-based aquaculture projects at the design and implementation stages.
- Growing an international reputation that may have a positive influence on the success of aquaculture projects as they seek external funding or develop new markets.

Over time, the impact of government funding administered by Kānoa evolved in various ways. As projects mature, they give rise to a cascade of effects, including the dissemination of research findings and processes, the development of innovative technologies, shifts in employment demands, and the subsequent positive outcomes for both downstream and upstream activities. This encompasses areas such as distribution, raw material supply, external investment, and the opening of new markets, all of which benefit from the initial injection of funding. Refer to 5.2.

3. Were there unintended consequences?

The research team did not identify any aquaculture-related unintended consequences.

4. Which projects benefited the most and least?

The evidence from this study indicates that smaller, iwi or community-based organisations like Whakatōhea Mussels Ōpōtiki Ltd have benefited the most in terms of improving economic and social outcomes. The same holds true for organisations in regions with pre-existing and comprehensive regional and project-specific plans. An example of how iwi organisations benefited can be seen in how Whakatōhea Mussels possesses a competitive advantage as the sole operator in the region. Whakatōhea's early investment in a mussel processing facility positions the company well for further sea farm development and production growth, with anticipated higher farming yields and profitability. They also have the resources and capabilities for effective management and expansion.

In a broader sense, the comprehensive planning that was undertaken for the harbour and mussel industry in Ōpōtiki had positive ripple effects on various projects within the township. This included initiatives such as the library and digital hub, which were able to advance in terms of construction, commissioning, and utilisation quickly and efficiently.

Conversely, Te Whānau-ā-Apanui, is at an earlier stage of development compared to Whakatōhea Mussels. The outcomes of Kānoa-administered government funding in Te Whānau-ā-Apanui projects, including the Te Huata mussel spat hatchery and water infrastructure projects, are yet to be realised. However, these endeavours hold potential for job creation and diversification into aquaculture-related ventures.

Meanwhile, Environment Southland (the brand name of the Southland Regional Council), CH4 Global (a climate tech startup founded in 2018), and the Cawthron Institute's National Algae Research and Development Centre directed their Kānoa-administered government funding toward innovative research in aquaculture, focusing on sustainable practices and technology. There were modest direct benefits to regional economies from these investments, however, the technologies, techniques, and processes developed through Kānoa-administered government funding contributions benefited other aquaculture projects located across Aotearoa, contributing indirectly to economic growth in the regions. Similarly, investments in ports and harbour development projects aimed to indirectly support aquaculture growth and job creation.

Those projects that face complex regulatory or consenting environments have a greater risk of not proceeding to construction or delivery. The West Coast whitebait farm's failure to proceed to construction underscores the challenges that complex ventures can face, despite significant government investment and stakeholder support. The inability to secure private equity, exacerbated by COVID-19 restrictions, environmental scrutiny, operational complexity, and community expectations, led to it not proceeding. Similarly, the rejection of Ngāi Tahu Seafood's open ocean salmon farm proposal off Stewart Island/Rakiura, despite its potential benefits, was attributed to concerns about the project's scale and environmental impact. Refer to 5.4.

5. **What investments were most effective for Māori?**

It is important to address Māori customary fishing rights with the sustainable management of aquaculture to ensure that Māori can participate fully in the industry. The government has several policies and programmes in place to support Māori involvement in the aquaculture industry, such as The government has policies and programmes in place to support Māori involvement in the aquaculture industry, as articulated in **The 2021 Aquaculture Implementation Plan** and **The Government's Aquaculture Strategy to 2025**. One of the goals in the Plan: 'Outcome 4 - Partnering with Māori and communities on opportunities to realise meaningful jobs, wellbeing, and prosperity' in the aquaculture industry (pp.14-15). These policies and programmes are helping to create jobs and economic opportunities for Māori, as does the Kānoa-administered government funding scheme. Refer to 5.5.

6. **What project implementation practices were most effective for Māori?**

Effective implementation practices in Māori aquaculture prioritise collaboration with iwi, as seen in the success of Whakatōhea Mussels, a community-driven and majority Māori-owned company committed to building local partnerships. Harbour development projects also engaged with iwi but faced some challenges due to their large-scale commercial nature. Challenges include resource-intensive processes, financial obstacles, and governance issues.

Collaborative models, like Whakatōhea Mussels, demonstrated resilience and adaptability, emphasising sustainability, community well-being, and economic benefits in the face of challenges like COVID-19. Refer to 5.6.

7. **Has the Kānoa-administered government funding improved the aquaculture industry?**

Kānoa-administered government funding played a vital role in advancing improvements and efficiencies in the aquaculture industry. Overall, in 2021, the aquaculture sector generated $1.8 billion in export revenue and provided employment for over 6,000 individuals, underscoring the positive impact of these investments (Ministry of Primary Industries, 2023). Refer to 5.7. While the exact extent of the contribution of the Kānoa-administered government funding alongside other investments is challenging to calculate, the funding spurred significant improvements in the sector. Notable examples include:

- Environment Southland developing sustainable salmon feed formulations improving salmon growth and reduced the harmful impact on the environment.
- Eco-friendly practices like closed-loop mussel farming, further reducing the industry's ecological footprint. Disease control methods, like sea lice management, received support, resulting in decreased reliance on, and use of, harmful chemicals.
- Whakatōhea Mussels producing a 63% higher mussel tonnage through innovation and continuous improvement through research and development.
- National Algae Centre project and CH4 Global expanding their production sites, contributing to business growth while mitigating climate change through sustainable practices.

8. **What could be improved to ensure sustainable growth?**

To ensure the sustainable growth of aquaculture, there are several recommendations for enhancing government funding administered by Kānoa. These include:

- Assisting applicants by connecting them with existing MBIE business advisory and support services.
- Offering access to consenting and regulatory information and including specific fields in the application process to enhance applicants' understanding of the required permits and of regional/national aquaculture strategic documents.
- Providing additional support for smaller organisations and Māori applicants.
- Ensuring there are consistent points of contact for those applying.
- Integrating risk assessments into large-scale projects.
- Choosing meaningful, long-term outcome measures for investments.

These improvements aim to balance the interests of various stakeholders, enhance equity, and align projects with sustainability goals while fostering economic growth and resilience in the aquaculture sector. Refer to 5.8.

2.0 INTRODUCTION

This report documents the contribution of the Kānoa-administered government funding scheme for the achievement of economic and social outcomes in the aquaculture industry for a selected sample of funded projects from 2019 to 2022.

This section introduces the overall Kānoa-administered funding scheme, the context of the Aotearoa aquaculture industry and the methodology used for the study. This chapter also provides an outline of the funded projects which were researched for this study to answer the evaluation questions.

2.1 Context

Kānoa – Regional Economic Development & Investment Unit (RDU) was established in 2018 within the Ministry of Business, Innovation and Employment (MBIE) to support the delivery of government funding to enhance economic development opportunities in regional New Zealand. When this research took place, the Kānoa-administered government funding scheme was comprised of several funding streams totalling around $4.3 billion in approved funding. The most significant funds were:

1. The Provincial Growth Fund (PGF)
2. COVID-19 Response and Recovery Fund - Infrastructure Reference Group
3. Regional Investment Opportunities (NZ Upgrade Programme)
4. Strategic Tourism Assets Protection Programme (STAPP)
5. COVID-19 Response - Worker Redeployment Package

Kānoa also leads the Sector Workforce Engagement Programme (SWEP), which is not a fund but a co-ordinator of government support to sector labour markets and has administered other funds that now held by the Ministry of Social Development (MSD), including: He Poutama Rangatahi – Youth Employment Pathways, and the Māori Trades and Training Fund.

Overall, the Kānoa-administered government funding had a positive impact, creating jobs, boosting economic activity, and improving infrastructure. The PGF invested over $3 billion in regional Aotearoa New Zealand. It helped create over 12,000 jobs through boosting productivity by an estimated 1.5% and overall economic activity by $1.5 billion (**Allen + Clarke**, 2021). The PGF also helped to build capacity in regional communities by providing training and support to businesses and organisations. It has also been particularly successful in supporting Māori and Pasifika communities, with 40% of PGF projects benefiting these communities (**Allen + Clarke**, 2021).

Kānoa invested over $38 million in aquaculture, supporting the growth of the industry. This funding largely focused on research and development, infrastructure, and marketing, creating new jobs in the sector and making operations more efficient and cost-effective.

According to the project business cases, applicants for Kānoa-administered government funding must demonstrate how their projects aligned with one or more of the six key outcome areas of the scheme:

1. Enhance economic development opportunities: this includes supporting projects that create jobs, attract investment, and grow businesses.

2. Create sustainable jobs: this includes supporting projects that create jobs that are long-term, well-paying, and environmentally sustainable.

3. Enable Māori to reach their full potential: this includes supporting projects that help Māori to achieve their economic, social, and cultural goals.

4. Boost social inclusion and participation: this includes supporting projects that help to reduce inequality and promote social cohesion.

5. Build resilient communities: this includes supporting projects that help communities to withstand shocks and stresses, such as natural disasters or economic downturns.

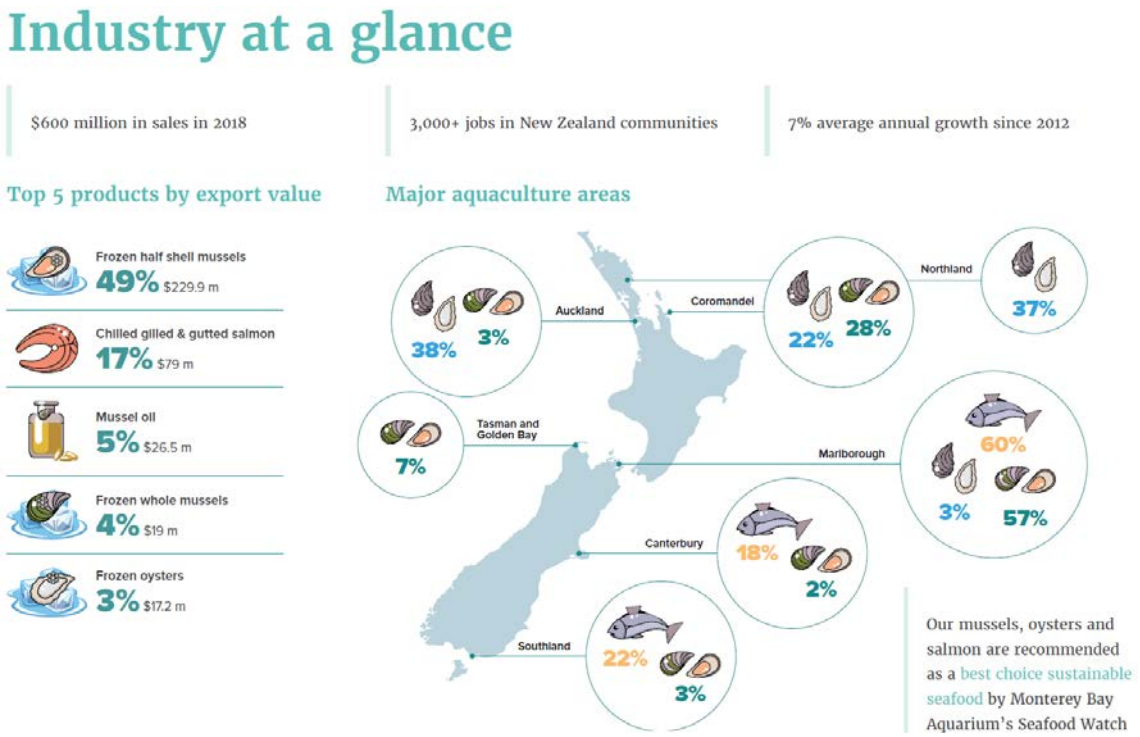
6. Help meet Aotearoa New Zealand's climate change targets: this includes supporting projects that reduce greenhouse gas emissions and help the nation to transition to a low-carbon economy.

The Kānoa-administered government funding is allocated to projects that are considered to have the greatest potential to achieve these outcomes. This report focuses on the economic and social contribution of the funding to the aquaculture industry from 2019 to 2022.

2.1.1 Background to Aotearoa New Zealand's aquaculture industry

Aquaculture is the farming of aquatic organisms such as fish, shellfish, algae, and other organisms and includes the controlled cultivation of aquatic organisms in all types of water environments, including oceans, lakes, rivers, and ponds. Aquaculture can be contrasted with commercial fishing, which is the harvesting of wild fish (Aquaculture New Zealand, 2019). While aquaculture is a growing industry worldwide, Aotearoa New Zealand is one of the leading producers of farmed seafood, exporting to 81 countries, with annual sales of around $650 million (Ministry of Primary Industries, 2022).

Figure 1: The Aotearoa New Zealand Aquaculture industry at a glance



The aquaculture industry 'at a glance', from The Government's Aquaculture Strategy to 2025 (2019), New Zealand Government.

Figure 1 highlights the top five seafood products by export value, including in New Zealand's major aquaculture areas. It shows that the aquaculture industry is a significant contributor to the economy. In 2018, the industry generated $600 million in export revenue and supported over 3,000 jobs in local communities. The industry is also growing rapidly, with annual growth of 7% since 2012 (Aquaculture New Zealand, 2019).

The 2021 Aquaculture Implementation Plan outlines the actions that the New Zealand government is taking to implement The Government's Aquaculture Strategy to 2025. It specifically outlines the following:

- Increasing the value of the aquaculture industry to $3 billion by 2030.
- Creating 10,000 new jobs in the aquaculture industry.
- Making aquaculture a more sustainable industry.

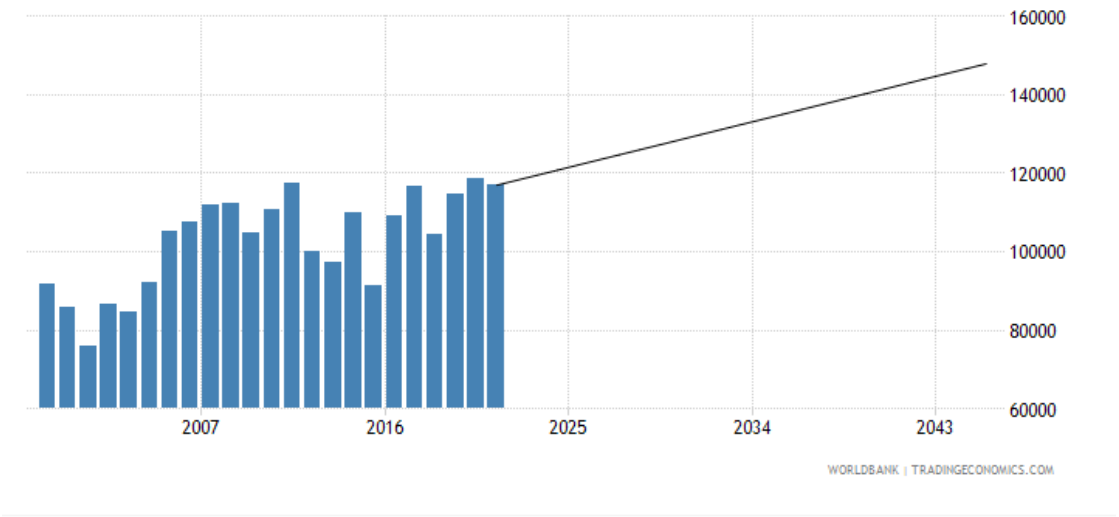
The Kānoa-administered government funding scheme contributes to the government's aquaculture strategy through funding the infrastructure which enables aquaculture-related industries to establish and increase in value. According to the 2021 Implementation Plan, such actions include investing in research and development to improve the productivity of aquaculture farms; providing regulatory certainty to make it easier for businesses to invest in aquaculture; and promoting New Zealand's aquaculture industry overseas.

The aquaculture industry is a rapidly growing sector both globally and locally with increasing employment opportunities. According to the World Bank, the aquaculture sector is projected to double over the following two decades (refer to Figure 2). The Implementation Plan's actions to create jobs in the industry include supporting the development of new aquaculture technologies and products; investing in aquaculture training and education; and working with Māori to develop aquaculture-related business and employment opportunities in their communities.

The 2021 Implementation Plan also outlines several actions that the government will undertake to make aquaculture a more sustainable industry. These actions include developing environmental standards for aquaculture; investing in research and development to improve the environmental performance of aquaculture; and working with the aquaculture industry to develop best practice environmental management practices.

Aotearoa New Zealand's aquaculture production was reported to be 116,839 metric tons in 2021 and is projected to grow significantly in the next 20 years, with annual farm output rising from 800 tons to 44,000 tons by 2040 (Ōpōtiki District Council, 2023). This growth will create jobs in vessel building, operation, maintenance, harvesting, and onshore processing.

Figure 2: World Bank projections of aquaculture production (metric tons) in Aotearoa New Zealand [2]



[2] Aquaculture production (metric tons) - actual values, historical data, forecasts and projections were sourced from the World Bank on July of 2023. Graph created from: https://tradingeconomics.com/new-zealand/aquaculture-production-metric-tons-wb-data.html

2.1.2 The Kānoa-administered government funding for aquaculture related infrastructure

A total of slightly more than $38 million was disbursed from Kānoa to fund projects associated with aquaculture-related infrastructure. The largest portion, amounting to $28 million, was allocated for investment in Whakatōhea mussel farming, including the production facility. The $28 million was primarily equity funding, with Whakatōhea being the majority shareholder. Table 1 depicts that smaller sums were spent across Aotearoa, mostly in exploring the viability of a variety of aquaculture projects such as seaweed (Asparagopsis), algae, salmon, shellfish and mussel farming.

Table 1: Kānoa-administered funding to aquaculture projects from 2019-2022

Project	Paid	Type
Accelerating Aquaculture Development in Whakatōhea Rohe Moana	$950,000	Grant
Mussel Farming and Production Facility (Concessionary Loan)	$5,800,000	Loan
Mussel Farming and Production Facility - Stage 1 & 2 (Grant)	$850,000	Grant
Mussel Farming and Production Facility (Equity 1)	$18,900,000	Equity
Mussel Farming and Production Facility (Equity 2)	$6,000,000	Equity
Establishing an aquaculture industry in the Chatham Islands - Feasibility and Business Case	$396,036	Grant
Commercial-scale harvest and cultivation of the native Aotearoa New Zealand seaweed species Asparagopsis to trigger the establishment of a new high-value regional aquaculture sector	$500,000	Grant
Building a bright future for aquaculture in Southland	$424,976	Grant
National Algae Research and Development Centre ("the Centre")	$2,000,000	Loan
Capability Assistance to prepare a proposal to develop a feasibility study & business case for a Golden Bay Mussel Sector Infrastructure & Waste Reduction facility in Tasman, Golden Bay	$18,000	Grant
Raglan Wharf Redevelopment	$2,300,000	Grant

In addition to funding directly targeted to aquaculture, Kānoa-administered government funding was disbursed to ports, harbours and supporting infrastructure, which has provided facilities to support several aquaculture projects. This amounted to just over $139 million as of 31 March 2023. The largest portion of this funding, amounting to $106 million, was primarily allocated to the Bay of Plenty region. Of this amount, $93 million was designated for an equity arrangement aimed at developing the Ōpōtiki harbour. As outlined in the Kānoa-administered

government funding project description, this development encompasses the construction of sea walls to establish a new ocean entrance, facilitating the success of substantial aquaculture projects like mussel farming, and encouraging private investments in marine-related industries, wharves, and a residential development.

The allocation of the $20 million in Te Tai Tokerau was distributed among eight projects, with $14 million provided in the form of grants and $6 million as a loan. Within the infrastructure funding, an investment of $6.5 million was directed towards the development of Whanganui port, while Waikato received nearly $4 million in financial support, with a significant portion of $3.5 million aimed at enhancing their capacity to boost mussel production at the Sugarloaf wharf.

Table 2: Funding drawn down for port infrastructure as at 31 March 2023.

Paid Funding	Equity	Grant	Loan	Total
Bay of Plenty	$103,876,017	$1,750,000		**$105,626,017**
Canterbury		$890,000		**$890,000**
Hawke's Bay		$200,000		**$200,000**
Manawatū-Whanganui/Horowhenua	$3,000,000	$3,490,000		**$6,490,000**
Tai Tokerau/Northland		$13,862,480	$5,841,855	**$19,704,335**
Te Tau Ihu/Top of the South		$600,000		**$600,000**
Waikato	$3,000,000	$828,000		**$3,828,000**
West Coast		$1,744,589		**$1,744,589**
Total	**$109,876,017**	**$23,365,069**	**$5,841,855**	**$139,082,941**

2.1.3 Whakatōhea Mussels Ōpōtiki Ltd

The aquaculture industry in Ōpōtiki is projected to grow significantly in the next 20 years, driven by the expansion of sea farms and the construction of a new processing facility.[3] The primary driver of this growth is Whakatōhea Mussels Ōpōtiki Ltd, which is currently the sole aquaculture operator in the region. Whakatōhea Mussels Ōpōtiki Ltd is an Ōpōtiki-based greenshell mussel (Whakatōhea kutai) farming business. It was founded in 2014 in partnership with the Whakatōhea Māori Trust Board and local investors. The company owns Aotearoa's first open-ocean mussel farm and a newly commissioned $37 million mussel processing facility.

[3] The aquaculture industry in Ōpōtiki is projected to grow significantly in the next 20 years. This growth is expected to create jobs in a variety of areas, including vessel building, operation, maintenance, harvesting, and onshore processing. By 2040, the industry is expected to require 17 vessels and a processing facility that can process up to 40,000 tonnes of product annually. The total number of jobs created by the aquaculture industry is estimated to be around 400.

The aquaculture industry is seen as a major source of future economic growth for the community leading to an estimated 1,000 new jobs and would increase mussel line rentals to Māori sea farm owners. The Kānoa funding is predicted to increase the farming yield per hectare from $800/ha to $1,200/ha using a grading facility and value-added processing. This would create significant social and economic value for the community (Application, 2022).

As previously mentioned, Whakatōhea Mussels emerged as a trailblazer in offshore sea farming, outpacing the initial projections outlined in the 2019 business case. (Whakatōhea Mussels Ōpōtiki Ltd, Kānoa Business Case). The early start of the processing facility construction set the stage for substantial growth in sea farm development and production in the future.

Table 3 illustrates how approved Kānoa-administered government funding was paid out to Whakatōhea Māori Trust Board and Whakatōhea Mussels (Ōpōtiki) Limited. A grant of $950,000 for developing the Whakatōhea aquaculture vision and a loan of $5.8 million for the mussel farming and production facility was paid to the Whakatōhea Māori Trust Board, along with a grant of $150,000 for a Ōpōtiki Harbour Development project director. A much larger sum was disbursed to Whakatōhea Mussels (Ōpōtiki) Limited for the mussel farming and production facility comprising a grant of $850,000 and total equity funding of almost $21 million.

Table 3: Funding breakdown for Whakatōhea Māori Trust Board and Whakatōhea Mussels (Ōpōtiki) Limited

Project	Paid
Accelerating Aquaculture Development in Whakatōhea Rohe Moana (grant)	$950,000
Mussel Farming and Production Facility (Concessionary Loan)	$5,800,000
Whakatōhea Māori Trust Board Ōpōtiki Harbour Development Project Director	$150,000
Mussel Farming and Production Facility - Stage 1 & 2 (Grant)	$850,000
Mussel Farming and Production Facility (Equity 1)	$14,700,000
Mussel Farming and Production Facility (Equity 2)	$6,000,000

The company's ongoing investments are focused on expanding the sea farms and constructing the processing factory. The nature of its aquaculture operations, requiring largely manual harvesting and processing of mussels, means that Whakatōhea Mussels is very much a people-orientated business. As mentioned earlier, Whakatōhea Mussels had to quickly expand its workforce due to the growth of the sea farm and the start of operations at the processing facility. As of July 2022, the company has a workforce of 181 employees. The company recently launched a third marine farming vessel, which will further expand their mussel harvesting and farm maintenance capabilities.

2.1.4 Te Whānau-ā-Apanui

Te Whānau-ā-Apanui are enabling growth and development of new businesses through Kānoa-administered government funding. Te Huata Charitable Trust (Te Whānau-ā-Apanui) drew $500,000 of an approved $6 million equity investment (as of December 2022), with in-principle support for the remaining costs to build Te Huata mussel spat hatchery near Te Kaha and an accompanying research hub (in development). The project is also supported by Callaghan Innovation, The Cawthron Institute and MPI and is consistent with Aotearoa New Zealand's aquaculture strategy. The project is expected to create approximately 17 full-time jobs. Te Whānau-ā-Apanui partnered with Aotearoa Mussel Limited to build the spat hatchery and research facility, having focused on geotechnical, environmental, and cultural impact consenting over the COVID-19 lockdowns and now moving to hatchery design and building consents.

Furthermore, according to an interview with Te Kaha Landowners Group, investments from Kānoa into the Te Kaha Landowners Group water infrastructure project, initially intended to support orchard developments, could open doors for innovative aquaculture ventures, such as freshwater fisheries with only a relatively small additional investment.

The commercial advantages resulting from Kānoa's investments in aquaculture within Te Whānau-ā-Apanui are expected to materialise in the coming years. These benefits encompass the economic uplift associated with the construction and subsequent operation of the hatchery and research hub. Additionally, new business prospects are actively being pursued by Te Whānau-ā-Apanui and the family-based land trusts, further contributing to the economic growth of the region.

2.1.5 The investments made in Southland

Southland, located in the southernmost region of New Zealand's South Island, is emerging as a significant hub for aquaculture. This coastal area boasts ideal conditions for sustainable aquaculture practices, with pristine waters and a favourable climate. The aquaculture industry in Southland encompasses a range of activities, including salmon and mussel farming, and it continues to expand, providing opportunities for economic growth and employment in the region. The **Southland Aquaculture Strategy** (n.d), articulates the importance of economic growth within Southland through the development of the aquaculture industry, generating employment opportunities, and elevating regional income.

A grant of $500,000 was disbursed to CH4 Global (described below) to assess the commercialisation of the cultivation and harvesting of Asparagopsis (a type of edible seaweed) and a $424,976 grant disbursed to Environment Southland Regional Council to develop a business case for land-based hatcheries for salmon smolt and mussel spat (Table 4).

Table 4: **Funding breakdown for Southland**

Project Description	Paid
To conduct a scale assessment of cultivating & harvesting Asparagopsis/seaweed to determine quickest to market scale option	$500,000
Funding to develop a business case to establish state of the art land-based hatcheries for salmon smolt and mussel spat in Southland to enable the expansion of the aquaculture industry (increase 25,000 tonnes per annum) in Southland.	$424,976

Environment Southland, as a regulatory body, played a pivotal role in advancing sustainable practices within the aquaculture industry. One of its notable contributions was the development of more sustainable and nutritious feed formulations for salmon. These formulations not only enhance the growth and health of salmon but also significantly reduce the environmental footprint associated with salmon farming. Environment Southland's regulatory oversight ensures that these innovative feed formulations meet environmental standards and contribute to the overall sustainability of the industry.

In addition to feed innovations, the Kānoa-administered government funding facilitated by Environment Southland was critical in driving environmentally friendly practices in aquaculture. This includes the creation of closed-loop systems customised for mussel farming. These closed-loop systems efficiently recycle water and nutrients within mussel farms, minimising waste and environmental impact. Environment Southland's role here involves setting and enforcing regulations to ensure that these systems are implemented effectively, safeguarding the environment.

Furthermore, the Kānoa-administered government funding supported by Environment Southland spurred advancements in disease prevention and control within aquaculture operations. An exemplar of this is the management of sea lice in salmon farms. Through research and development, Environment Southland contributed to the implementation of innovative approaches for sea lice control. These methods not only result in a significant reduction in sea lice occurrences but also reduce the industry's reliance on chemical treatments, aligning with sustainable and environmentally friendly practices. Environment Southland's regulatory oversight ensures that these disease management methods meet safety and environmental standards, balancing the industry's productivity with ecological preservation. In essence, Environment Southland's multifaceted regulatory role was instrumental in advancing aquaculture practices that prioritise sustainability, environmental responsibility, and the long-term health of the industry.

Overall, despite the challenges, the aquaculture development in Southland has the potential to be a win-win for the region. It could provide significant economic, and social benefits, and it could help to position Southland as a leader in the global aquaculture industry. The development could also create new jobs and opportunities for Māori, who have a long history of fishing and aquaculture in the region.

2.1.6 CH4 Global

CH4 Global (a climate tech startup founded in 2018), aims to reduce methane emissions from livestock by feeding ruminant animals Asparagopsis seaweed. Asparagopsis cultivation and harvesting will bring both economic and environmental benefits and will support Aotearoa's broader sustainability goals. Using Asparagopsis as a feed additive could reduce methane emissions from cows by up to 95% through the way it interacts with gut bacteria. The funding (initiated around late 2019 and concluding in late 2020), helped CH4 Global engage in testing to understand the challenges and value chain associated with seaweed production in Southland.

The challenges in testing included difficulties in obtaining wild seaweed for trials and processing, leading to a pivot away from marine aquaculture due to uncontrollable ocean factors like temperature and predation. The funding also enabled them to learn about seaweed attachment techniques and post-harvest handling to preserve bromoform, a vital compound. The focus on Southland, enabled by the Kānoa-administered government funding, resulted in a major production site at the old Ocean Beach freezing works, creating permanent jobs and stimulating the local economy. CH4 Global envisions further growth, with plans to hire more staff and expand within the next five years.

CH4 Global maintains positive relationships with local iwi and community groups. Challenges arose during consent for CH4 Global's trial in Big Glory Bay, primarily due to concerns about seaweed fouling existing infrastructure. CH4 Global is collaborating with the University of Otago and NIWA, benefiting both institutions economically and through training opportunities. Their collaboration extends beyond Southland to Northland and the possibility of using seaweed to treat effluent from other aquaculture activities.

2.1.7 The National Algae Research and Development Centre, Cawthron Institute

The Cawthron Institute is Aotearoa New Zealand's largest independent science organisation. Its main focus is on applied research in the areas of water, food, and environment. The Institute has made significant contributions to the country's economy and environment through its work on waterborne pathogens, wastewater treatment, food products, climate change, and marine ecosystems. For example, the Institute developed a method for detecting and monitoring waterborne pathogens in the early 1990s. This method is now used by water treatment plants and other organisations around the world.

The National Algae Centre, based at Cawthron's Aquaculture Park in Nelson, is a commercialisation effort by the Cawthron Institute to develop high-value algae compounds. The Centre supports research in drug development, nutritional supplements, methane reduction, and greenshell mussel development, potentially impacting a significant portion of New Zealand's production. The Centre used the Kānoa-administered government funding to recruit staff and procure equipment. While currently employing three to four people, it has

potential for a much larger staff. Monetisation remains complex due to funding structures, with a $2 million grant contributing to infrastructure and employment (Table 5).[4]

The Centre is reported as having the potential to act as a catalyst for new industries, add value to existing capabilities, increase productivity, and create new jobs in skilled occupations. In addition to higher wage jobs, the Centre is also expected to provide community benefits such as increased connectedness, facilitate the development of manufacturing industries, and add to local intellectual property that would otherwise be lost overseas. In the long-term, the Centre has the potential to create high-value export opportunities and jobs in the blue water economy, research, science, and technology (National Algae Centre Project, Cawthron Institute Business Case and Application, 2022). In addition, the Cawthron Institute is developing new food products made from these microalgae, which have the potential to be a sustainable and healthy alternative to animal protein (**Gamble**, 2023).

Table 5: The funding breakdown for the National Algae Centre Project

Project Description	Paid
This project enables the Cawthron Institute to develop a National Algae Research and Development Centre with two pilot plant facilities in Nelson. One pilot plant focuses on macro algae and is now complete.	$2,000,000

Wages in the Nelson area are around 15% lower than the Aotearoa New Zealand average. The Centre has the potential to attract and retain talent, boosting incomes and opportunities in the region, which is important given the ageing population of Nelson.

2.1.8 Harbour development projects

The Kānoa-administered government funding contributed to the development of several ports in Ōpōtiki, Whakatāne, and Whanganui, and across Canterbury, Hawke's Bay, Tai Tokerau, Te Tauihu, Waikato, and the West Coast. Table 6 lists the location of the ports and the type of funding which was approved and paid to date, along with a brief description of each project. More detailed information is provided about the Ōpōtiki Harbour Development project, as regional fieldwork was undertaken in Ōpōtiki.

Excluding the funding for Ōpōtiki, around $89 million was approved and over $44 million paid for port-related infrastructure. Of note, are the projects undertaken in partnership with iwi. A total of $12 million was invested into the Whanganui port project, Te Pūwaha, which is a partnership between Whanganui iwi and other stakeholders including council, Kānoa and local business (further information follows). In Whakatāne $11 million was invested into a boat harbour on Māori freehold land in a partnership between Te Rāhui Lands Trust, Kānoa, Ngāti

[4] Table 6 shows that $2 million of a $6 million loan was paid to The Cawthron Institute to support the development of the National Algae Research and Development Centre in Nelson.

Awa Group Holdings Limited, and Whakatāne District Council.[5] There were multiple smaller investments across the other regions.

As is the case in Ōpōtiki (see below), while neither of the Whanganui and Whakatāne port projects are directly related to aquaculture, they both stimulate key outcomes such as increased employment and investment through related businesses, e.g., boat building and repair, and berthing facilities.

More directly related to aquaculture, are the $3 million invested into the Sugarloaf Wharf in Waikato (supporting an increase in mussel production from 25,000 tonne to 42,000), and $600,000 paid to support "expected growth in mussel tonnage (2,200 hectares in the next three years) in Tasman Bay and Golden Bay" (Kānoa Project Description, MBIE, 2023). The remainder of the Kānoa-administered government funding was paid to support a broad range of wharf and harbour projects, including repairs or upgrades to existing wharf structures, and dredging river mouths or lagoons.

[5] Refer to https://www.terahui.nz/.

Table 6: Funding allocation for ports[6]

Place	Type	Approved	Paid	Project Description
Whakatane	Loan	$4,700,000		Development of a fit for purpose Boat Harbour Development on Māori freehold land.
	Grant	$1,000,000	$1,000,000	
	Equity	$13,900,000	$9,800,000	
Canterbury	Grant	$90,000	$90,000	To evaluate the regional and South Island economic impact of the proposed Wharf development project.
	Grant	$1,000,000	$800,000	A business case study leading to the South Bay Harbour Precinct design and construction
Hawke's Bay	Grant	$200,000	$200,000	To assist with the relocation of a public weighbridge facility from between the entertainment precinct and mixed-use commercial area of Ahuriri, Napier to the Pandora industrial zone, Napier
Whanganui	Loan	$5,000,000		To revitalise the Whanganui Port so it can support local business expansion in marine services and fisheries and meet the increasing demand for freight moving through the region
	Equity	$12,500,000	$3,000,000	
	Grant	$90,000	$90,000	Whanganui Port – Geotechnical Feasibility
	Grant	$7,500,000	$3,400,000	Strengthening the lower river training structures at the mouth and along the lower reach of the Whanganui River.
Tai Tokerau	Grant	$890,000	$890,000	Opua Wharf
	Grant	$1,114,000	$1,114,000	Upgrade to Russell Wharf
	Grant	$1,300,000	$1,300,000	Investigate the development of the necessary infrastructure to accommodate the installation and on-going operation of marine engineering and maintenance support facility to naval & commercial vessels as well as some Royal NZ Navy support services.
	Grant	$1,815,000	$1,815,000	Provision of community connectivity to the coastal marine area by constructing a new wharf at Rangi Point, and improved facilities at Te Karaka and Motuti. This will enhance safe and practical use of maritime structures by communities in the North Hokianga.
	Grant	$3,770,000	$3770000	Paihia Wharf

[6] The cost allocations exclude the funding for the Ōpōtiki Harbour Development Project which is documented separately.

Place	Type	Approved	Paid	Project Description
	Grant	$4,950,000	$4,950,000	This project aims to begin the redevelopment of the biggest harbour in Aotearoa New Zealand. An investigation and analysis of financial and economic benefits for a network of wharves together with stakeholder engagement will be conducted.
	Loan	$5,841,855	$5,841,855	To purchase a MBH560 Cimolai travel lift (the Travel Lift) which includes shipping, assembly and commissioning (the Acquisition) to be used at the Port Whangarei Marine Centre. The Borrower will also carry out the following development at the Port Whangarei Marine Centre: 1. civil works for travel lift dock at South Shipyard. This includes construction of the piles and headstocks to support the
Te Tauihu	Grant	$200,000	$200,000	Fund a business case to address a significant infrastructure problem, the inadequacy of Port Tarakohe, impacting the growth aspirations of the aquaculture industry in the Tasman District.
	Grant	$400,000	$400,000	The redevelopment is required to address and cater for the expected growth in mussel tonnage (2,200 hectares in the next three years) in Tasman Bay and Golden Bay.
Waikato	Grant	$270,000	$270,000	To prepare a detailed business case that considers options around developing Kopu as a Marine Servicing/ Business Precinct & defines a solution that can be delivered in an efficient manner.
	Grant	$558,000	$558,000	Expand the Sugarloaf Wharf to meet future development & growth. Detailed cost analysis, business case, consent & build
	Equity	$19,950,000	$3,000,000	After the PGF funded feasibility study this project is the development of 1,215ha of water space increasing capacity of mussel production from 25,000 tonne to 42,000 tonne of mussels.
West Coast	Grant	$94,589	$94,589	To assess the economic and social benefits of retaining, upgrading and developing land and facilities at the Port of Westport on the West Coast.
	Grant	$100,000	$100,000	Further investigations following a previously completed feasibility study to investigate options form managing West Coast Ports under 1 Governance structure; to define the needs for Resilience Requirements & Maritime Safety
	Grant	$750,000	$750,000	The Fishing Port Lagoon is badly silted up to the extent vessels can only move around at high tide. Require financial support to undertake a one-off dredging to 4m.
	Grant	$800,000	$800,000	Funding for the acquisition of a new dredge to be purpose built to Dredge the Greymouth Port Lagoon

2.1.8.1 Ōpōtiki Harbour Development

The Ōpōtiki harbour and marina projects were the single largest port spend for Kānoa (Table 7) and is integral to the development of a thriving and expanding aquaculture industry.

Table 7: Funding provided for the Ōpōtiki Harbour Development Project

Project Description	Paid
To unlock safe harbouring & access to processing for the development of the Eastern BOP substantial aquaculture opportunity (grant).	$750,000
The harbour development project will build sea walls to create a new entranceway to the ocean. It will enable significant aquaculture initiatives such as mussel farming and catalyse private investment in marine related industries, wharves and a residential development (equity).	$92,576,017
Validation Stage of the Ōpōtiki, Harbour Development Project (grant).	$3,667,040

The Ōpōtiki Harbour Transformational Project is a major development that has the potential to significantly benefit the region by greatly expanding and improving navigability of the harbour entrance. This will open up Ōpōtiki to new marine-based commercial opportunities, including aquaculture. The project was projected to generate approximately $49 million in economic value through the rock supplied to build the harbour entrance. It also presents an opportunity for an additional $18-20 million in residential development. The project is set to reach completion in 2023 and has already resulted in the creation of sustained employment opportunities for local residents by providing jobs in the aquaculture sector.

A primary benefit of the harbour investments are to support aquaculture operations for offshore sea farms. To realise these advantages, the harbour must be operational day-to-day, regardless of the marina's completion status. In the interim period between the openings of the harbour and marina, having a temporary facility becomes vital to harness the benefits of aquaculture. Ideally, this interim facility should be in line with the harbour's construction budget and should serve a long-term purpose. This ensures the continuous advantages of the harbour within the allocated budget and ensures that it remains a valuable asset in the long run (**Ōpōtiki District Council**, 2023).

3.0 METHODOLOGY

This mixed-methods study incorporated qualitative interviews, a survey, focus groups (both online and via a place-based wānanga), and a document analysis. This research grouped the funded projects in the aquaculture industry by the following two clusters:

1. The National Algae Research and Development Centre (Cawthron Institute, Nelson), Asparagopsis seaweed trial in Southland (CH4 Global) and various harbour development projects.

2. Aquaculture projects administered through the two iwi - Whakatōhea and Whānau-ā-Apanui in Ōpōtiki.

The qualitative data collection was supplemented by an online survey. The total sample for the survey was 29 funding recipients of whom 10 responded (all respondents were based in Ōpōtiki), giving a response rate of 34 percent. This was not sufficiently high to be considered representative, however, the open-text responses of survey respondents are used as another source of qualitative information.

This report also integrates data from secondary sources of information such as aquaculture strategic plans, progress reports, government publications and reporting data. The study team consulted with MBIE as well as the interview participants on the most relevant documents.

Following data analysis, a rigorous thematic organisation was undertaken to streamline the report's structure for easy reference and seamless cross-referencing. This method, essentially a meticulous synthesis of primary and secondary data, ensures that the report offers a comprehensive and coherent insight into the economic and social outcomes linked to the Kānoa-administered government funding between 2019 and 2022.

3.1 Theoretical framework

To address the difficulties of undertaking a traditional impact assessment which measures the attribution of the Kānoa-administered government funding to the aquaculture industry, this study utilises Contribution Analysis. This investigates the sector outcomes derived from the funding, according to the funding recipients. Unlike an impact assessment, Contribution Analysis can assess the cause-and-effect relationships in a system with a multitude of potential causal factors through interrogating a hypothesised Theory of Change (Mayne 2001, 2019; Morton 2015). The Contribution Analysis approach can be summarised as the process of testing a hypothesised Theory of Change through gathering evidence.

This study is structured in a way that documents the evidence addressing the research questions which emerged from the construction of the project-based Theories of Change (Refer to Appendix 1). The report highlights the differences to the original assumptions related to outcomes and indicators from the primary data gathered throughout the report.

3.1.1 The evaluation questions

The evaluation questions seek to understand the outcomes of the Kānoa-administered government funding in the aquaculture industry. The questions are:

1. What outcomes were realised?
2. When were the outcomes realised?
3. Were there unintended consequences?
4. Which projects benefited the most and least?
5. What investments were most effective for Māori?
6. What implementation practices were most effective for Māori?
7. To what extent did the Kānoa-administered government funding contribute to improvements in aquaculture?
8. What could be improved to ensure sustainable growth?

The report structures its findings by the research questions.

3.2 Limitations

The survey response rate and small sample size are limitations of the study. However, the online survey was not the only source of evidence. Qualitative interviews, focus groups (both online and via place-based wānanga) and a document analysis of evidence for all of the projects form the basis for the findings.

4.0 ANALYSIS

The research questions were answered through the conceptual lens of the Contribution Analysis used to assess the outcomes derived from the Kānoa-administered government funding in aquaculture. A logic model was developed to understand the Theory of Change intended by the investment. In Contribution Analysis, the intended Theory of Change and the corresponding logic model are tested for validity after primary data collection and revised accordingly. Figure 3 illustrates the original Theory of Change and an outcomes model for the aquaculture industry.

Figure 3: The original Theory of Change and Logic Model for the Aquaculture industry

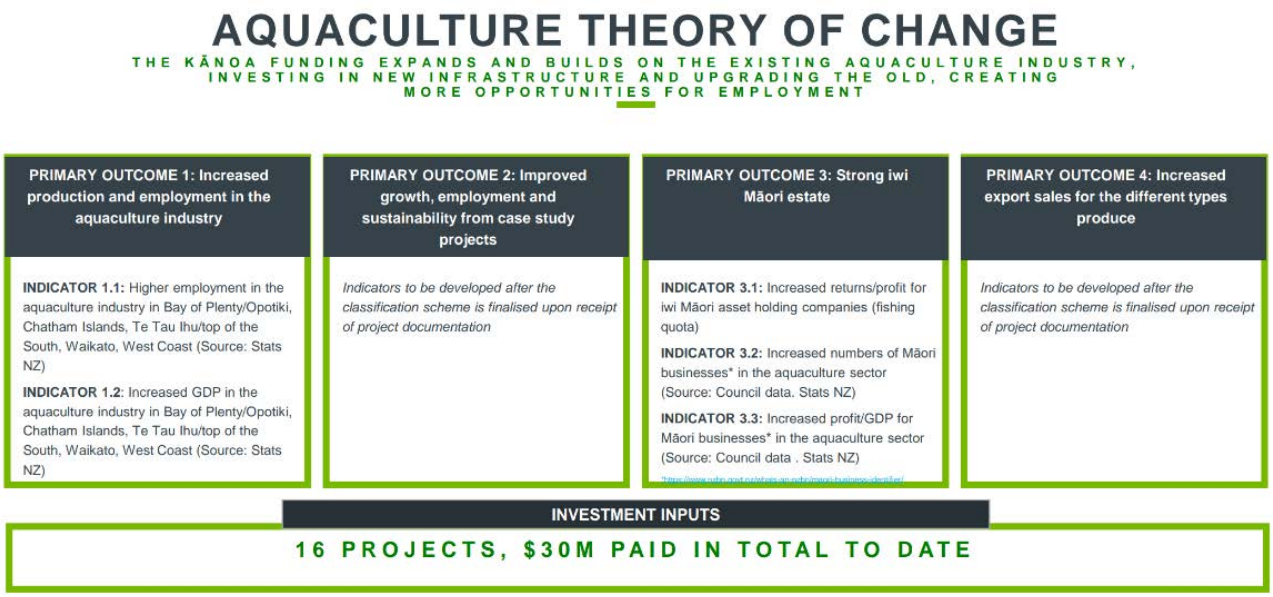


Figure 3 was derived through conducting a document review of several funded projects, for which separate outcomes models and Theories of Change were created. Appendix 1 includes the outcomes models (inclusive of the Theories of Change) for the original selected projects in aquaculture. From the document review, the research team identified four high-level outcomes for the aquaculture industry:

1. increase production
2. Increase employment
3. benefit Māori
4. increase export sales

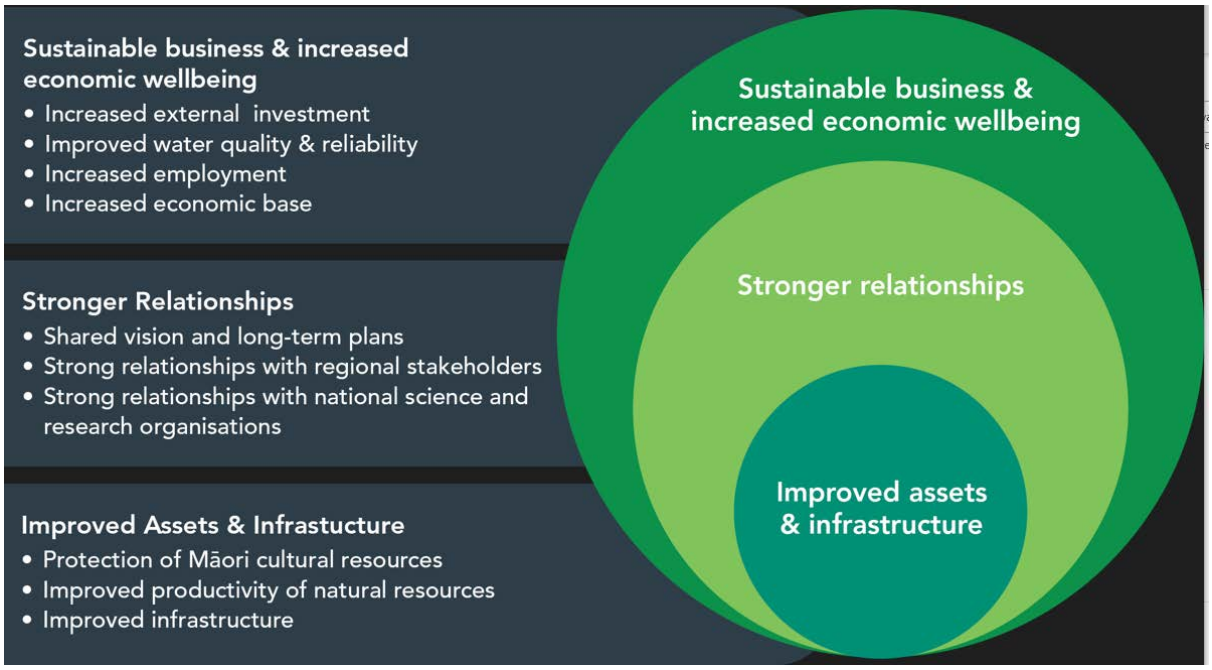
The primary data collection also revealed that while the theorised outcomes for the aquaculture industry remain, the research team also found that the outcomes over-lapped in a holistic manner, meaning that funding targeted towards commercial projects such as the

Ōpōtiki mussel factory (part owned by the Whakatōhea Māori Trust Board) not only contributed towards employment outcomes, but also toward wellbeing-related outcomes.

Figure 4 illustrates the refreshed logic model which reflects the findings from the primary data collection and more accurately reflects the research participants' perspectives of the contribution that the Kānoa-administered government funding has made in the aquaculture industry.

Figure 4: The revised Theory of Change and Logic Model for the aquaculture industry

Theory of Change: *The Kānoa-administered government funding accelerates economic growth in the aquaculture industry, improving the wellbeing of residents, families, whānau, hapū, and iwi.*



All research participants agreed the Kānoa-administered government funding directly contributed to '**Improved assets and infrastructure'**. Kānoa-administered government funding 'de-risked' external investment into provincial regional councils with a small or constrained financial base enabling commercial opportunities that would otherwise not occur. These infrastructure projects in both aquaculture and aquaculture-adjacent businesses (e.g., ports and harbours) enabled immediate improvements in local outcomes and grew relationships with key stakeholders.

'Stronger relationships' emphasises the importance of relationships with recognised research collectives and external funders (national and international) to the success of the funded projects. For iwi and traditionally non-commercial entities, these relationships were actualised following Kānoa-administered government funding. These relationships 'turbo-charge' any investment in the region and dramatically improve the success of the initiatives. Together, these drove improvements and enabled '**Sustainable business & increased**

economic wellbeing' to meet Aotearoa's sustainable development goals while improving education, training, employment and economic growth (inclusive of wage increases) in the sector.

It is important to note that the outcome indicators for each of the three outcome levels (as displayed in Figure 4 above) are likely to capture the changes that take place over many years, not just the immediate results. For example:

- Large commercial projects require a significant amount of time for the development of robust plans, securing funding, and construction before they commence generating income.
- Changes in workforce needs have an inherent lag as local education and training pathways adapt and develop capacity and capability to meet those needs.
- Environmental indicators similarly take time (sometimes generational) before measurable improvement is seen. This is particularly applicable where there has been significant man-made degradation of freshwater and marine ecosystems.

5.0 THE FINDINGS

This section summarises the findings from the primary and secondary data collection which are grouped by the evaluation questions. There are a wide variety of projects which received PGF and Kānoa-administered government funding from 2017 onwards. The scope of this study includes projects funded between 2019 and 2022. However, the impact of earlier funding would have contributed to the economic and social impacts within the study's timeframe.

5.1 What outcomes were realised?

The research participants indicated that the Kānoa-administered government funding had a positive impact across various areas. It facilitated economic development by creating sustainable jobs. It also promoted social inclusion, resilience in communities, and sustainability goals. Additionally, the funding improved aquaculture assets and infrastructure, reducing investment risks and enhancing commercial opportunities. Moreover, it fostered stronger relationships with key stakeholders, increasing business confidence in the sector. Below are some examples of outcomes achieved.

5.1.1 Increased employment

Several of the funded organisations reported increased employment in the aquaculture sector as a result of the Kānoa-administered government funding. For example, The Cawthron Institute's National Algae Centre, supported by a $2 million grant, focuses on high-value algae compounds for drug development and methane reduction in livestock. This initiative has already created job opportunities (currently employing four people), with potential for future expansion. It aims to generate more jobs, boost local industries, and create valuable export opportunities, including sustainable microalgae-based food products. A representative from CH4 Global also stated that their project has generated employment because of the Kānoa-administered government funding.

The rapid expansion of Whakatōhea Mussels in Ōpōtiki, including facility operationalisation, led to substantial workforce growth, totalling 181 employees by July 2022, and positioning the company for further development and production expansion. Te Whānau-ā-Apanui received a $6 million aquaculture grant, with $500,000 for a mussel hatchery and research hub, creating 17 jobs.

5.1.2 Effective training and development

In Ōpōtiki, where a majority of residents identify as Māori, successful local workforce programmes were integrated with the harbour development project, (led jointly by Whakatōhea and Ōpōtiki District Council). This strategic approach addressed potential mismatches in skills and ensured that prospective employees had the necessary skills and qualifications for roles within the aquaculture industry. In addition, the Ōpōtiki Harbour Development project's social procurement process (which heavily targets roles in the aquaculture industry), engaged local businesses, creating jobs and providing training opportunities.

Whakatōhea Mussels made substantial investments in training and development, spanning both processing and sea farming positions. This includes the introduction of the Tūāpapa Programme, a pre-employment foundation course that blends elements of the Primary Industry Skills (Level 2) qualification with essential employment skills and insights into Whakatōhea's history.[7]

Additionally, the company offers the Apprenticeship in Seafood Processing (Level 3 and 4), tailored for supervisor and manager development, encompassing various crucial areas. Collaborating with the Aotearoa New Zealand Academic and Learning Institute (NZALI), Whakatōhea Mussels designed a customised educational programme aimed at enhancing numeracy and literacy skills, particularly in leadership and communication.[8] Furthermore, the company established a work experience process for marine farm training and enrolled several marine farm crew members in the Toi Ohomai Institute of Technology Advanced Deckhand Qualification which is a 52-week programme formally recognising the knowledge gained by the crew during their time on vessels. However, these training initiatives have faced significant challenges over the past two years, primarily due to the disruptive impact of the COVID-19 pandemic on operations and planning.

5.1.3 Promoted innovation and secured intellectual property

Whakatōhea Mussels stands at the forefront of innovation in the field of open-ocean mussel farming. While the initial projection in the 2019 business case envisioned 400 mussel lines in place by 2022, the actual count stood at 298 by June 2022. Although this falls short of the original projections, Whakatōhea Mussels is actively addressing this challenge through operational adjustments and the commissioning of an additional servicing vessel. Remarkably, despite the lower line count, the company managed to achieve a mussel greenweight tonnage that surpassed expectations by an exceptional 63%. Originally slated for construction in 2023/24 with operations beginning in 2024, the facility's commissioning was expedited by two years, fostering a swifter realisation of its advantages. Furthermore, this accelerated development lent support to the broader aquaculture industry in the Eastern Bay of Plenty and established a solid foundation for future growth. While its productivity significantly surpassed the 2019 projections, as the produce is seasonal, variations should be expected. Nonetheless, if the positive trend persists over the next three to four seasons, it is reasonable to anticipate elevated crop levels and increased economic benefits on a broader scale.

Environment Southland, a regulatory authority, championed sustainable aquaculture practices. Notably, it improved salmon feed formulations for growth, health, and environmental sustainability. Their oversight ensures adherence to environmental standards. The organisation also funded eco-friendly initiatives, such as closed-loop mussel farming systems,

[7] Graduates of this programme undergo NZQA accredited unit standards training delivered by a Primary Industry Training Organisation (PITO) trainer to complete the Primary Industry Skills Level 2 qualification, a requirement for new production staff in processing areas.
[8] This training is provided by NZALI and funded through the Tertiary Education Commission (TEC) Employee Numeracy and Literacy Fund.

reducing waste. Additionally, research by Environment Southland led to innovative sea lice control methods, minimising chemical use. Their regulatory role significantly advanced sustainable aquaculture, emphasising ecological health and long-term industry viability. The details are discussed under section 5.2.3.

CH4 Global is addressing methane emissions from livestock by incorporating Asparagopsis seaweed into their diet. This sustainable initiative aligns with Aotearoa's environmental goals and has the potential to cut bovine methane emissions by up to 95% by interacting with gut bacteria. Funding support received between late 2019 and late 2020 was instrumental in enhancing the firm's understanding of seaweed production challenges and the value chain. Challenges, like sourcing wild seaweed and ocean-related issues, prompted shifts in their methodological approach to research, development and practice. CH4 Global collaborates with local communities, academic institutions, and other regions to maximise the impact of their innovative methane reduction solution.

5.1.4 Challenges

Overall, although the Kānoa-administered government funding contributed to improved social and economic outcomes for the researched projects in the aquaculture sector, research participants encountered some challenges in realising these outcomes. These are described below.

5.1.4.1 Challenges encountered by iwi in realising outcomes

Reflecting on their experiences with Kānoa, representatives from both Whakatōhea and Te Whānau-ā-Apanui noted the high staff turnover within Kānoa. While they reported that the people they had worked with were good, "they kept changing and with no warning", with a consequent lack of institutional knowledge. For iwi, this meant information flowed through in an ad-hoc manner.

Iwi typically have very complex portfolios across education, social, health, and commercial domains, and manage an equally complex mix of grants, loans, equity, settlement money, and other government funding. Whakatōhea had a clear vision and oversight of this complexity. Te Whānau-ā-Apanui did not have the same oversight or project management resourcing across the iwi, with most projects occurring at the hapū or land trust level. For both iwi, the capacity required for writing business cases, proposals and implementing projects were sparce and resulted in additional expenses. Often, these costs are related to applying for consents that require the assistance of external consultants, none of whom were local.

> *The consent process for the existing Eastern Sea farms cost over $1 million. It's been slowly paid back over 10 years, and that cost was because of that contested nature. We got another consent, we managed to get that non-notified, as soon as it is notified, it gets ramped up…the cost is when you do the consent part* (Interview participant).

The above quote illustrates the significant expense tied to the consent phase. Furthermore, the Whakatōhea mussel farm project faces a similarly expensive resource consent process, reported to exceed $1,000,000, posing a substantial financial challenge. Opposition from some members of the hapū and iwi adds to the complexity, as concerns about environmental impact and the mussel fishery have been raised. These concerns encompass issues such as visual pollution, marine ecosystem disruption, and potential environmental harm.

While not directly attributable to the supervision of the Kānoa-administered government funding, some of the challenges experienced by the research participants were:

- Inequitable burden: smaller groups carry the same cost to build infrastructure as larger groups regardless of the economic resources available.
- Insufficient budgetary allocations: there have been challenges in terms of operating within an allocated budget due to the escalating costs of raw materials.
- Meeting the threshold effect for many investments: some projects require further funding to make them self-sufficient, especially given the lack of large local financial resources and a perception of greater financial risk by external investors.

Similarly, one survey participant reported that the consenting process for the Ōpōtiki Harbour project had been delayed by more than 12 months due to the Resource Management Act (RMA) and the Bay of Plenty Regional Council's handling of cultural issues. The Regional Council reported that they had not been able to determine who represents each hapū, who they should be dealing with, and how to progress the project. Therefore, the project is still in the process of obtaining all the necessary consents from the Regional Council.

The Kānoa-administered government funding helped the project to proceed with the consent process, but there have been challenges. One challenge was dealing with the Regional Council's resource consents process, which can be lengthy and complex. Another challenge was reaching consensus with local hapū, who may have different views on the project. The Council has not accepted the mana of the Whakatōhea Trust Board, which made it difficult to progress the project. While the project has the support of the Whakatōhea iwi, according to a survey participant, a few individuals ‘hijacked’ the consenting process and overruled the wishes of the 17,000 other Whakatōhea affiliates of the iwi. This caused significant delays to the construction of the berths, marina, and wharf that they need to make use of the harbour.

Likewise, one research participant was disappointed with the Resource Management Act (RMA) and the Regional Council’s handling of the cultural issues and believes that any revision of the RMA must address hapū governance. The respondent believes that the RMA should provide funding to support hapū marae committees and mandate a formal democratic process. This would allow regional councils to have more confidence in getting real hapū/iwi guardianship of the whenua, awa, and moana.

5.1.4.2 Challenges encountered by the Ōpōtiki District Council

The Ōpōtiki District Council is working to attract and retain businesses and investment; develop the district's workforce; and improve the district's infrastructure. The following challenges encountered by the Ōpōtiki District Council, predominantly relate to the administration of the Kānoa-administered government funding scheme:

- **Short-term funding cycles and 'siloed' funding**: the construction of a wharf hub was hampered by the short-term funding cycle, which made it difficult to plan and implement this long-term project. A more flexible application and funding approach would have helped the Council with the planning process.
- **Insufficient resources for workforce development:** the funding for the project did not recognise the overheads involved in workforce development. This made it difficult to deliver effective training programmes.

The Council faced various challenges and operational weaknesses, including a significant lack of coordination between the construction of harbour structures and the marina, resulting in project delays.

5.1.4.3 Environmental challenges

While this research did not investigate the ecological repercussions of aquaculture, it should be noted that the aquaculture industry requires a significant amount of land and water and this can have a negative impact on the environment. Aquaculture can pollute water, damage coral reefs, and disrupt fish populations. Aquaculture farms can produce large amounts of waste, leading to the depletion of oxygen levels in the water, as well as the growth of harmful algae blooms (Ministry of Primary Industries, 2013).

The aquaculture industry in Southland faces several critical challenges. Firstly, there is a looming shortage of juvenile salmon, which poses a significant threat to the industry's long-term sustainability due to the current supply being inadequate for the growing demand. Secondly, there is a pressing need to facilitate the transition to hatchery technology for shellfish production, replacing wild harvesting practices. This transition necessitates the development of advanced hatchery technology.

Bridging the gap between research and commercialisation is crucial, as much aquaculture research exists, but the industry needs to effectively translate these findings into commercial products. The industry must focus on enabling polyculture research, which involves farming multiple species together, as it offers a more sustainable approach to aquaculture that requires further exploration in the Southland region. Further, existing farms are causing adverse

environmental effects, and new proposals for large salmon farms are being rejected. Additionally, oyster harvesting faces restrictions due to the presence of Bonamia parasites. [9]

The Ministry for Primary Industries (MPI) is responsible for regulating the aquaculture industry and has several policies and regulations in place to mitigate the negative ecological effects of aquaculture. These include:

- Resource consents: all aquaculture farms in Aotearoa New Zealand require a resource consent from MPI. This consent process includes an environmental impact assessment which helps to identify and mitigate potential environmental impacts.
- Best practice guidelines: MPI developed several best practice guidelines for aquaculture farmers. These guidelines cover a range of topics, including water quality management, habitat protection, and disease prevention.
- Monitoring and enforcement: MPI monitors the environmental performance of aquaculture farms. If a farm is found to be in breach of its resource consent, MPI can take enforcement action.

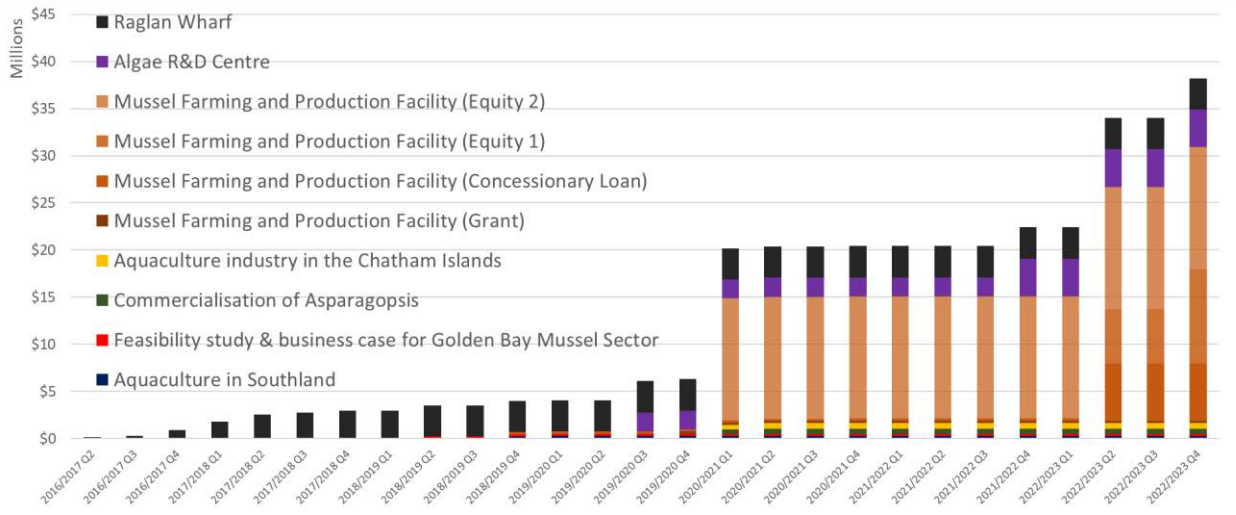
5.2 When were the outcomes realised?

As at March 2023, cumulative aquaculture investment stood at $38 million. Two significant tranches of Kānoa-administered government funding can be seen in the aquaculture investment space (Figure 5). Beginning in 2017, a cumulative investment of $6 million had slowly built up with a sudden increase in paid funding as equity in the Whakatōhea mussel farming and production facility. The cumulative investment totalled $20 million by mid-2020 as part of the 'shovel-ready' response to COVID-19. In late 2022, another significant investment of $34 million was made in the Whakatōhea mussel farming and production facility, comprising paid equity and loans.

The Whakatōhea mussel farming and production facility officially opened in mid-2021 with production ramping up ever since. The construction of the plant and associated infrastructure, especially the Ōpōtiki port development, contributed to employment, training and supporting industries (e.g., concrete, building) since 2019. Employment and training for staff of the production facility has been occurring since 2021. There were two other notable investments: one was in the Raglan wharf project, which received approximately $3 million in Kānoa-administered government funding between 2017 and 2018. The second significant investment occurred in early 2020 when $2 million was allocated to the Cawthron Institute's National Algae Research and Development Centre in Nelson.

[9] Bonamia is a type of tiny parasite that can infect certain types of shellfish, especially oysters. These parasites are harmful and can cause many of these shellfish to die. This is a problem for both shellfish farming and the environment. People in the shellfish industry work to prevent and control these infections to protect the shellfish. There are different kinds of Bonamia, each affecting specific types of shellfish.

Figure 5: Funding over time for the different types of projects ($millions)



The benefits of the Kānoa-administered government funding have been realised at several stages of the funding life cycle, depending on the specific outcomes, maturity and complexities of the projects. In general, funding in the pre-investment phase enabled community organisations to properly resource business planning and project management. Funding for the 'shovel ready' infrastructure projects enabled construction and the provision of equipment and labour, as well as meeting the short-term fixed and variable operating costs.

Any industry outcomes driven by Kānoa-administered government funding occurs in different ways at different times. Kānoa-administered government funding in pre-build activities like business cases, scoping, and resource consents are essential, but have little direct impact on economic activity in the aquaculture sector. Of the $38 million invested into aquaculture, $3 million was for developing business cases, funding applications or related activities. The Kānoa-administered government funding for construction yielded direct benefits, such as increased employment opportunities and heightened demand for construction materials. As the infrastructure projects mature, different employment opportunities and skills are required such as distribution and sales. Further, raw material suppliers and tradespeople also eventually benefit from the investment.

5.3 Were there unintended consequences?

The research team did not identify any aquaculture-related unintended consequences.

5.4 Which projects benefited the most and least?

Smaller, community-based organisations such as Whakatōhea Mussels Ōpōtiki Ltd benefitted the most from the Kānoa-administered government funding due to the following reasons:

- **Significant growth opportunities:** The aquaculture industry in Ōpōtiki is projected to grow substantially, and Whakatōhea Mussels Ōpōtiki Ltd is well-positioned to benefit from this growth. As the sole aquaculture operator in the region, the company has a competitive advantage.

- **Innovative technology:** The use of a grading facility and value-added processing is expected to increase the farming yield. This can lead to higher revenues and profitability for the company.

- **Pre-existing well-developed plans:** The existence of well-developed relationships, plans and business cases, before the Kānoa-administered government funding was applied for, allowed the early construction of the mussel processing facility, which sets the stage for substantial growth in sea farm development and production. It allowed the company to capitalise on opportunities sooner than anticipated.

With a workforce of 181 employees and the addition of a new marine farming vessel, Whakatōhea Mussels has the human resources and capabilities to manage and expand its operations effectively.

Te Whānau-ā-Apanui has also received substantial Kānoa-administered government funding, including grants and equity investments totalling $6 million. However, they are at an earlier stage of development compared with Whakatōhea Mussels, and therefore, the outcomes are yet to be realised. The Te Huata mussel spat hatchery and research hub project is expected to create approximately 17 full-time jobs. Further, the investment in water infrastructure projects, initially intended to support orchard developments, opens doors for innovative aquaculture ventures like freshwater fisheries. This diversification of business activities can lead to new revenue streams.

Environment Southland, CH4 Global and the National Algae Research and Development Centre within Cawthron Institute, utilised the Kānoa-administered government funding to further their innovative research. Investments in aquaculture support innovative practices such as sustainable feed formulations, Asparagopsis cultivation and disease prevention methods, boosting the blue water economy, research, science, and technology sectors in the long-term. Due to the complexity and expenses involved in this work, the Kānoa-administered government funding was used to enhance their existing resources. Similarly, while the funding which was invested in ports and harbour development projects enabled the creation of jobs, due to the scale and complexity of these research ventures the funding that was used to enhance existing resources to enable the growth of the aquaculture sector had a smaller direct impact on regional economic wellbeing, and funding may well have been gained from sources other than the Kānoa-administered government funding.

Overall, the projects in the evaluation sample successfully navigated challenges, even in the face of the COVID-19 pandemic. What contributed significantly to this resilience, was their robust financial backing and the presence of supportive stakeholder relationships that aligned with their long-term visions.

Those projects proposing to build or deliver into complex regulatory or consenting environments have a greater risk of failure. West Coast whitebait farm project's failure to secure private equity for building the farm, illustrates how a promising venture can falter due to challenges. Despite significant government investment and stakeholder support, securing private equity, compounded by COVID-19 restrictions, proved insurmountable. Environmental scrutiny, operational complexity, and community expectations added additional pressures. This highlights the need for adaptable strategies, clear investment pathways, and a favourable economic environment in complex, environmentally-focused projects (Naish, 2022).

Similarly, an independent panel declined Ngāi Tahu Seafood's application for a resource consent to establish an open ocean salmon farm off the northeastern coast of Stewart Island/Rakiura, despite recognising potential benefits for Ngāi Tahu whānui, Rakiura, and the broader Southland community. Ngāi Tahu Seafood applied for the project under the Covid-19 Recovery (Fast-track Consenting) Act in 2020, with a proposed location off Rakiura's northern coast, emphasising sustainable salmon farming. However, the panel expressed concerns about the large-scale and dispersed nature of the salmon farms, noting their significant impact on an environment relatively untouched by human activities (Kelly, 2023).

5.5 What investments were most effective for Māori?

While this report evaluates the contribution of the Kānoa-administered government funding to aquaculture, it is important to address Māori customary fishing rights with the sustainable management of aquaculture to ensure that Māori can participate fully in the industry. The government has several policies and programmes in place to support Māori involvement in the aquaculture industry, such as The government has policies and programmes in place to support Māori involvement in the aquaculture industry, as articulated in The 2021 Aquaculture Implementation Plan and The Government's Aquaculture Strategy to 2025. One of the goals in the Plan: ‘Outcome 4 - Partnering with Māori and communities on opportunities to realise meaningful jobs, wellbeing, and prosperity’ in the aquaculture industry (pp.14-15). These policies and programmes are helping to create jobs and economic opportunities for Māori, as does the Kānoa-administered government funding scheme.

5.6 What implementation practices were most effective for Māori?

Implementation practices that prioritise collaboration and partnership with iwi are the most effective for Māori, as exemplified by Whakatōhea Mussels which is governed through the Whakatōhea Māori Trust Board. Whakatōhea Mussels serves as a prime example of a community-driven, community-benefiting organisation. This Māori-led and majority-owned

aquaculture company is committed to sustainability, community collaboration, and the production of environmentally friendly, high-quality mussels. They prioritise local employment and establish collaborative programs with the local health authority. Furthermore, they cultivate educational partnerships by developing an aquaculture curriculum with the local college. The CEO of the Whakatōhea Māori Trust Board underscores the strength of collective efforts for mutual prosperity. Sustainability, collaboration, and innovation are central to their mission, aiming to establish a sustainable aquaculture industry that benefits the environment, the economy, and community well-being. Despite the impact of COVID-19 on the economy, the community demonstrated resilience and adaptability due to its collaborative model.

The harbour development projects, which enable the continued growth of the aquaculture industry, also consulted with local iwi groups. However, as these are large-scale commercial construction projects which are not iwi owned and operated, they cannot be compared with businesses which are. Further, there have been several hurdles of timeliness regarding some harbour development projects, which delayed the benefits to the community. The Cawthron Research Institute also engaged with local iwi groups in Nelson and employ Māori staff in their algae research facility (research interview).

It is also important to note what does not work best for iwi. As previously mentioned, iwi hold complex portfolios across education, social, health, and commercial domains, and required extensive resources for business cases and proposals. The expensive resource consent process, like in the Whakatōhea mussel farm project, presented financial challenges, exacerbated by local opposition and environmental concerns. Additionally, issues like inequitable burden, insufficient budget allocations, and meeting investment thresholds were noted. Delays in projects, like the Ōpōtiki Harbour, were attributed to complex consent processes and disputes within hapū, requiring improved governance and funding support.

5.7 Has the Kānoa-administered government funding improved the aquaculture industry?

Through its diverse funding portfolio, the Kānoa-administered government funding played a role in the development of the Aotearoa New Zealand aquaculture industry. From the research and development initiatives funded in Southland and Nelson to the infrastructure investments in the Bay of Plenty, the Kānoa-administered government funding helped the industry to become more competitive, sustainable, and productive. While the exact extent of the contribution of the Kānoa-administered government funding cannot be isolated from other sources of investments when assessing sector-wide improvements and efficiencies, below are some examples of improvements which the Kānoa-administered government funding contributed to.

One notable innovation is the development of more sustainable and nutritious feed formulations for salmon by Environment Southland, leading to improved salmon growth and health, alongside technology to reduce the environmental footprint of salmon farming. Additionally, funding was instrumental in promoting environmentally friendly aquaculture

practices, such as the creation of closed-loop systems for mussel farming, which efficiently recycles water and nutrients, thereby lowering the environmental impact of mussel cultivation. Furthermore, funding boosted aquaculture productivity by supporting the development of novel disease prevention and control methods, exemplified by Environment Southland's contribution to the management of sea lice in salmon farms, resulting in a significant reduction in sea lice occurrences and reduced reliance on chemical treatments.

Whakatōhea Mussels accelerated innovation and economic growth in the aquaculture industry. They expedited the construction and commissioning of a processing facility, bringing forward economic and social benefits. Their pioneering work in open-ocean mussel farming required extensive research and development, with real-world testing. Although installation of mussel lines was below projections, they achieved a 63% higher mussel greenweight tonnage through innovation and continuous improvement. This success suggests the potential for increased production and economic gains if replicated across the industry in the future.

Te Whānau-ā-Apanui are developing a mussel spat hatchery near Te Kaha, with support from the Cawthron Institute, to develop technology and techniques that match local conditions, to supply a burgeoning mussel aquaculture industry.

CH4 Global, a climate tech startup, aims to reduce methane emissions from livestock by feeding them Asparagopsis seaweed. The funding obtained between late 2019 and late 2020 helped them understand seaweed production challenges and value chains. They pivoted from marine aquaculture to focus on Southland, establishing a major production site and creating local jobs. Collaborations with local communities, universities, and NIWA have enriched research and economic prospects, with plans for further growth in the next five years and potential expansion to other regions for effluent treatment.

The Cawthron Institute, a New Zealand research organisation, made substantial contributions to the country's economy and environment in water, food, and environmental research. Their work includes waterborne pathogen detection methods used worldwide. The National Algae Centre project, supported by a $2 million loan, focuses on high-value algae compounds for drug development, methane reduction, and more. It has the potential to create jobs, boost local industries, and open high-value export opportunities, including sustainable microalgae-based food products. Overall, algae research offers a multitude of benefits that span environmental protection, human health, economic growth, and scientific advancement. These benefits position algae as a versatile and promising resource for addressing pressing global challenges, from climate change and pollution to nutrition and sustainable agriculture.

As a result of these investments, the Aotearoa New Zealand aquaculture industry has become more competitive, sustainable, and productive. In 2021, the aquaculture industry generated $1.8 billion in export revenue and employed over 6,000 people (**Ministry of Primary Industries,** 2023). In addition, The Ministry of Primary industries and Aquaculture New Zealand worked together with the New Zealand salmon industry to improve the traceability and quality of aquaculture products through improved labelling and certification systems. For example, a new labelling scheme for salmon products was created to provide consumers with assurance regarding the sustainability of the salmon they buy (**Ministry of Primary Industries,** 2023).

5.8 What could be improved to ensure sustainable growth?

The following recommendations for improvement are identified from the challenges articulated in this report:

- **Improve the resource consenting process:** Many research participants expressed concerns regarding the high costs and substantial delays associated with the resource consent application process, particularly for iwi and smaller organisations. These delays can significantly impact the progress of aquaculture projects, as the decision on consent is essential for determining whether a project can advance or must be discontinued. Balancing the interests of local iwi, the community, the nation, and the environment is crucial in this context. To streamline consenting and enhance coordination with other regional activities, Kānoa is in a position to provide additional information and support to applicants through Kānoa's own expertise and experience (regionally and nationally) or through the direct involvement of other MBIE functions around business support.

- **Foster equity and resilience:** Supporting smaller organisations and Māori organisations is crucial. This support can come from regional government agencies, local collaborative efforts, or direct resource allocation. It helps overcome barriers in aquaculture initiatives. Additionally, a Kānoa-administered contingency fund could assist projects facing risks, ensuring their stability. Some projects may identify new opportunities as they mature, necessitating proportionate resourcing for their impact.

- **Maintain a single point of contact:** Following the suggestions of iwi, who must manage several projects, it is suggested that Kānoa enables service continuity by maintaining a consistent point of contact for applicants throughout a project's lifecycle. This will contribute to better relationship building and maintenance with applicants.

- **Incorporate risk assessments into large-scale projects:** Large-scale aquaculture projects often encounter additional technological and environmental complexities that increase the risk of project failure and necessitate extended timeframes before commencement of operations. Despite these challenges, it is essential to consider the substantial economic advantages that aquaculture can bring at both local and national levels. Therefore, risk assessment criteria should be structured to encompass these inherent delays, risks, and benefits in a balanced manner, recognising the potential contributions of large-scale aquaculture to economic growth and sustainability.

- **Select meaningful long-term outcome measures:** When assessing a project's impact, it is recommended to avoid relying solely on self-reported job counts, which have limitations like missing data and lack of clarity on employment details. Alternative indicators, such as roles created (e.g., Project Managers, Financial Analysts), self-rated progress scales, new patents, and secured external funding, offer a more comprehensive view. Additionally, linking regional-level indictors to provide aggregated national-level provincial indicators from datasets like the Stats NZ IDI

would be beneficial. For projects linked to iwi objectives, it is crucial to incorporate generational aspirations through robust monitoring. This alignment ensures projects resonate with iwi values, fostering meaningful and sustainable outcomes.

6.0 CONCLUSION

The Kānoa-administered government funding delivered a range of positive outcomes within the aquaculture sector, contributing significantly to the industry's growth and sustainability. Job creation was a notable outcome, with various projects and initiatives generating employment opportunities across the aquaculture sector. For instance, Whakatōhea Mussels' expansion in Ōpōtiki led to a substantial increase in its workforce, Te Whānau-ā-Apanui's aquaculture grant created jobs in mussel hatchery and research activities, with a small number of jobs created through the Cawthron Institute investment, with some additional funding to pre-existing roles around project management and business case development for projects at an earlier stage such as those run by Environment Southland and CH4 Global. In Ōpōtiki, where most residents identify as Māori, the funding facilitated successful workforce programmes integrated into the Ōpōtiki Harbour Development project, creating further job opportunities.

Beyond job creation, the funding fostered innovation and intellectual property development. Whakatōhea Mussels, in partnership with the Whakatōhea Māori Trust Board, pioneered offshore sea farming, achieving remarkable productivity gains and establishing crucial infrastructure for the aquaculture industry. The Kānoa-administered government funding encouraged environmentally responsible practices, with organisations like Environment Southland driving sustainable initiatives and improving feed formulations for salmon farming. These advancements align with environmental standards and promote eco-friendly practices, such as closed-loop mussel farming systems and innovative sea lice control methods.

Furthermore, the Kānoa-administered government funding supported groundbreaking solutions like CH4 Global's methane reduction technology using Asparagopsis seaweed. This initiative not only addresses environmental goals by reducing bovine methane emissions but also fosters economic growth through the establishment of production sites and collaboration with local communities and academic institutions.

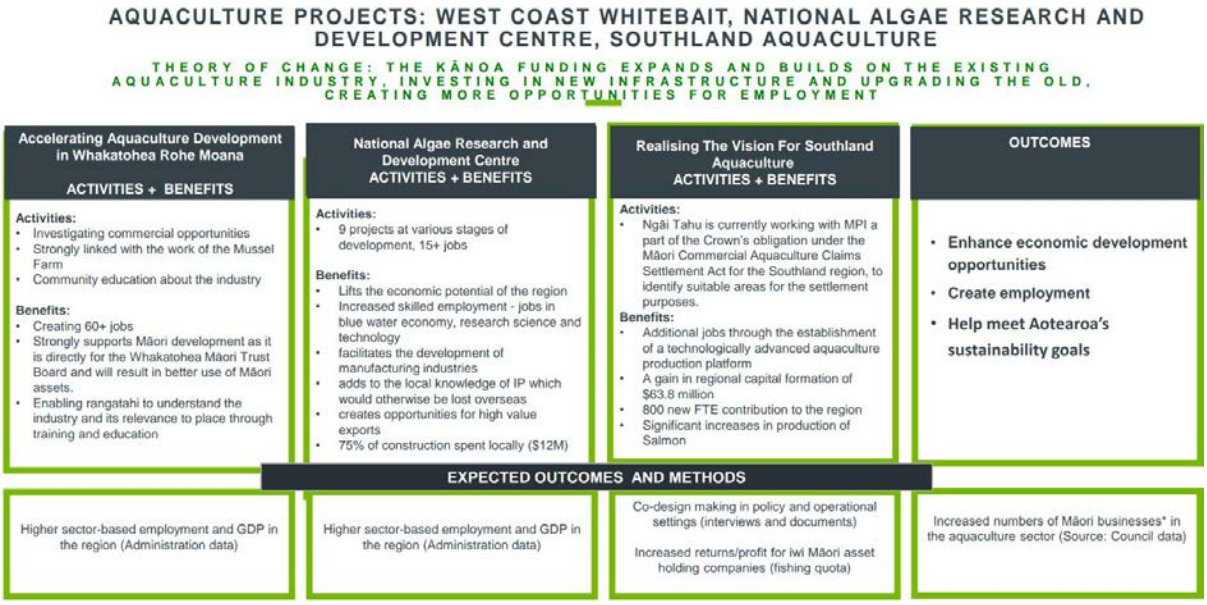
Despite the positive outcomes, the research team makes several recommendations for enhancing the Kānoa-administered government funding scheme to ensure sustainable growth in aquaculture. Firstly, additional support to applicants who are applying for resource consents as part of their Kānoa funded project could be provided by introducing the applicant to MBIE’s business support services. This can help streamline projects while considering broader interests. Secondly, fostering equity and resilience is crucial, especially for smaller organisations and hapori Māori. Additional support for these organisations, and a contingency fund, could help here. Thirdly, maintaining a consistent point of contact for applicants can enhance relationship building and service continuity.

Furthermore, risk assessments should be incorporated into large-scale aquaculture projects, acknowledging the complexities and potential economic benefits while balancing inherent delays and risks. Lastly, selecting meaningful long-term outcome measures and ways to measure them, beyond self-reported job counts, can provide a more comprehensive assessment of project impacts. These measures may include roles created, self-rated progress scales, patents, secured funding, and regional-level indicators. Aligning projects with iwi objectives and generational aspirations through robust monitoring ensures meaningful and

sustainable outcomes. By implementing these recommendations, the Kānoa-administered government funding scheme can better support the growth and sustainability of the aquaculture industry in Aotearoa New Zealand.

Overall, the Kānoa-administered government funding is contributing to a growing aquaculture industry in Aotearoa New Zealand.

7.0 APPENDIX 1: CASE SUMMARIES



8.0 APPENDIX 2: RECRUITMENT MATERIAL

Kānoa Impact Studies Evaluation

INFORMATION AND CONSENT FORM

You are invited to participate in an online interview and/or participate in a place-based hui because of your organisation's involvement in the Kānoa or the Provincial Growth Fund scheme. This evaluation is undertaken by *Allen + Clarke* for the Ministry of Business, Innovation and Employment (MBIE).

What is the Evaluation about?

The Kānoa Impact Studies evaluation focuses on the funded projects in the Ōpōtiki region and in the aquaculture sector. Data collection for the evaluation will commence between March and May 2023. Your participation will help us answer the following evaluation questions:

- To what extent has Kānoa regional investment in Ōpōtiki and aquaculture contributed to the anticipated economic, social, cultural and/or environmental outcomes?
- At what stage of the funding life cycle were these realised or not realised?
- Is there evidence of unintended consequences?
- Which projects benefited the most and least from the investment and why?
- What lessons can be learned about the investment approaches that are most effective for Māori?
- To what extent are the outcomes of Kānoa investment sustainable and how can it support long-term social and economic development?
- To what extent has the Kānoa investment funding contributed to industry-specific improvements and efficiencies in aquaculture?
- What features of the Kānoa investment scheme could be improved to ensure sustainable growth in aquaculture?

What is involved for those taking part?

There are two primary data collection methods used in this evaluation: (1) a short on-line survey sent to all organisations in Ōpōtiki or for aquaculture-related projects who received funding via Kānoa or the Provincial Growth Fund and (2) focussed interview or hui.

If you agree to participate, the online interview will take about 40-60 minutes at a time convenient for you. Some organisations will be invited to participate in a hui in Ōpōtiki. We will provide more information about this closer to the date.

Do I have to take part in the evaluation?

You do not have to take part in these interviews or hui. If you choose to take part and then change your mind later, you can pull out by contacting us (there is contact information below). You may stop taking part at any time. If you stop taking part, the information you have given us that has not been analysed will be deleted. Your decision to withdraw from the evaluation will not affect your current or future relations with the Ministry or *Allen + Clarke.*

How will your information be used?

For our report, we will need to name and present the work of some organisations who received funding. These organisations will be used as illustrative case studies. We will always check the information we present on an organisation or project with those who provided us with the data for accuracy before completing our work. To receive a copy of all the information collected during the interview and the draft report, please contact Marie Nissanka (contact details below) and she will arrange a copy to be sent to you.

With your permission, we will record and take notes during the interviews and during the hui. These will be stored securely and remain confidential to the evaluation team. Your personal information will not be shared with anyone else.

Are there any risks and benefits of taking part?

This evaluation has no known risks and there are no direct personal benefits from taking part in this evaluation.

Who can answer my questions about the evaluation?

Marie Nissanka and Brendan Stevenson are leading the evaluation team and can answer any questions you have about the interview or the evaluation. Their contact details are:

- Marie Nissanka: **mnissanka@allenandclarke.co.nz**
- Brendan Stevenson: **bstevenson@allenandclarke.co.nz**

Research Ethics

Allen + Clarke is a corporate member of the Aotearoa New Zealand Evaluation Association (ANZEA); and all of our Evaluation + Research Practice staff also belong to the Australian Evaluation Society (AES). Through these organisations *Allen + Clarke* is expected to follow high standards. If you would like more information about these standards, the booklet *Guidelines for the Ethical Conduct of Evaluations* is available at **www.aes.asn.au**. We are ethically obliged to advise our client if we become aware of certain situations, such as someone being in danger, or corruption.

Statement of Consent

Please select the boxes below, as appropriate:

☐ I consent to take part in the interview.

☐ The purpose and nature of this review has been explained to me and I have had the opportunity to ask questions.

☐ I consent to my interview being audio recorded and notes might be taken. These will be used to ensure the accuracy of information collected. This information will be stored securely and will only be accessible by the evaluation team.

☐ I understand that my personal details are confidential and will not be disclosed to anyone outside of the evaluation team.

☐ I understand that I have the right to request any information held about myself.

☐ I understand that information I provide will be presented in a way that does not identify me.

☐ I would like to receive a summary of findings via email.

My email address is _____

Signature _____ Date _____

Printed name _____

Subject: Invitation to participate in the Kānoa Funding Recipient Survey

Kia Ora

You are invited to participate in this short survey because of your organisation's involvement in the Kānoa or the Provincial Growth Fund scheme. The survey is part of an evaluation undertaken by Allen + Clarke for the Ministry of Business, Innovation and Employment (MBIE). Your contribution will provide valuable insights into the design of future regional funding initiatives.

If you were not directly involved in the project(s) after they had been funded, could you please forward this invitation to those who were managing the funded projects.

Completing this survey will take approximately 10 minutes.

By clicking this link you consent to Allen + Clarke using your responses to inform the evaluation. We will not collect any personally identifying information and your responses will be kept confidential to the research team at Allen + Clarke.

Please contact evaluation@allenandclarke.co.nz if you have any questions.

Nga mihi, Brendan Stevenson

Subject: Reminder to participate in the Kānoa Funding Recipient Survey

Kia Ora

You were recently invited to participate in this short survey because of your organisation's involvement in the Kānoa or the Provincial Growth Fund scheme. The survey is part of an evaluation undertaken by Allen + Clarke for the Ministry of Business, Innovation and Employment (MBIE). Your contribution will provide valuable insights into the design of future regional funding initiatives.

If you were not directly involved in the project(s) after they had been funded, could you please forward this invitation to those who were managing the funded projects.

Completing this survey will take approximately 10 minutes.

By clicking this link you consent to Allen + Clarke using your responses to inform the evaluation. We will not collect any personally identifying information and your responses will be kept confidential to the research team at Allen + Clarke.

Please contact evaluation@allenandclarke.co.nz if you have any questions.

Nga mihi,Brendan Stevenson

9.0 APPENDIX 3: SURVEY QUESTIONS

Introduction

Thank you for filling in the Kānoa Funding Recipient Survey. Please complete all questions and move through the survey by clicking the 'next' button. If you feel that any of the questions are not applicable to your organization or your project/s please select N/A or type N/A into the open textbox. The survey should take about 10 minutes to complete.

* 1. What organisation do you represent?

* 2. How many projects did you receive funding for (excluding feasibility studies and businesses cases)?

Project One

* 3. Please list the name of the first project that received funding from the Provincial Growth Fund (PGF) and/or Kānoa funding scheme

* 4. What impact did your project have on these outcome areas?

	No impact	Some impact	A large impact
Enhance economic development opportunities	○	○	○
Create sustainable jobs	○	○	○
Enable Māori to reach their full potential	○	○	○
Boost social inclusion and participation	○	○	○
Build resilient communities	○	○	○
Help meet Aotearoa's sustainability goals	○	○	○

What can you tell us about those impacts?

* 5. How has the funding helped the project?

* 6. At what stage is this project at?

* 7. What have some of the challenges been?

* 8. How many new jobs were created in the past 12 months?

REPEAT QUESTIONS 3 TO 8 FOR THE NUMBER OF PROJECTS ENTERED

Overall impacts

* 63. How have Māori in the area been impacted as a result of the projects?

* 64. How have these funded projects increased the capacity for kaitiakitanga (guardianship and protection)?

* 65. How did your projects collaborate with iwi and hapū?

* 66. How did your projects engage with the wider community?

* 67. Have you noticed any unintended consequences in one or more of your projects?

68. Are there any final comments you would like to make?

10.0 REFERENCES

Allen + Clarke. (2021). Evaluation of the Provincial Growth Fund. Retrieved from https://www.mbie.govt.nz/dmsdocument/21594-evaluation-of-the-provincial-growth-fund

Gamble. W. (2023, July 29). You can't see them but they might be bigger than dairy. Stuff.co.nz. Retrieved from https://www.stuff.co.nz/nelson-mail/news/132457580/you-cant-see-them-but-they-might-be-bigger-than-dairy

Kelly, R. (2023, August 2). Independent panel declines Ngāi Tahu's plans for a salmon farm off the coast of Stewart Island. Stuff. https://www.stuff.co.nz/national/132666191/independent-panel-declines-ngi-tahus-plans-for-a-salmon-farm-off-the-coast-of-stewart-island

Mayne, John. "Addressing attribution through contribution analysis: using performance measures sensibly." *Canadian journal of program evaluation* 16, no. 1 (2001): 1-24.

Mayne, John. "Revisiting contribution analysis. "*Canadian Journal of Program Evaluation* 34, no. 2 (2019).

Morton, Sarah. "Progressing research impact assessment: A 'contributions' approach." *Research Evaluation* 24, no. 4 (2015): 405-419.

Ministry for Primary Industries. "Sustainable Aquaculture." Ministry for Primary Industries, 2023, www.mpi.govt.nz/fishing-aquaculture/aquaculture-fish-and-shellfish-farming/sustainable-aquaculture/.

Naish, J. (2022, April 28). $700,000 Government funding spent on failed whitebait farm proposal. Stuff. https://www.stuff.co.nz/national/128478173/700000-government-funding-spent-on-failed-whitebait-farm-proposal

National Algae Centre Project, Cawthorne Institute Business Case and Application, 2022

New Zealand Government. (2021). Aquaculture Implementation Plan 2021-2025. Ministry for Primary Industries, New Zealand. Retrieved from https://www.mpi.govt.nz/dmsdocument/45343-2021-Aquaculture-implementation-plan-

New Zealand Government. (2019). The aquaculture industry 'at a glance'. In The Government's Aquaculture Strategy to 2025. ISBN: 978-1-99-000833-7

New Zealand Government. (2019). The Government's Aquaculture Strategy to 2025. Ministry for Primary Industries, New Zealand. Retrieved from https://www.mpi.govt.nz/dmsdocument/15895-The-Governments-Aquaculture-Strategy-to-2025

Ōpōtiki District Council. (2023). Te Ara Moana a Toi - Initial Benefits Assessment. Retrieved from https://www.odc.govt.nz/repository/libraries/id:2bpcgtp1b1cxby3k9b0b/hierarchy/sitecollectiondocuments/our-

council/Reports%20%26%20Studies/Reports/Te%20Ara%20Moana%20a%20Toi%20-%20Initial%20Benefits%20Assessment.pdf

Plew, D., Knight, B. (2018). Overview of ecological effects of aquaculture. Ministry for Primary Industries, New Zealand. Retrieved from https://www.mpi.govt.nz/dmsdocument/4300-Overview-of-ecological-effects-of-Aquacultur

Southland Aquaculture Kānoa Business Case and Application, 2022.

Southland Aquaculture Strategy (n.d), Southland, New Zealand.

Trading Economics. (2023, July 1). New Zealand - Aquaculture Production (metric Tons) - 2023 Data 2024 Forecast 1960-2021 Historical. Retrieved from https://tradingeconomics.com/new-zealand/aquaculture-production-metric-tons-wb-data.html

Tera Hui. (n.d.). Retrieved from https://www.terahui.nz/.

Whakatōhea Māori Trust Board. (n.d.). Te Ratonga. Retrieved from https://www.whakatohea.co.nz/te-ratonga.

Whakatōhea Mussels Ōpōtiki Ltd, Kānoa Business Case, 2022.

ALLEN + CLARKE

+64 4 890 7300

office@allenandclarke.co.nz

www.allenandclarke.co.nz