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| A. PROJECT TITLE | 2.1 Transitioning to a Blue Economy: Scoping and Horizon Scanning |
| “SHORT” TITLE | Transitioning to a Blue Economy |
| B. THEME / PROGRAMME | Theme 2: Creating value from a blue economy |

C. PROJECT KEY RESEARCHERS (CVs for all listed to be provided in SharePoint container using template provided in container)

| Role | Name | Institution / company | Email |
|--------------------|-------------------|-----------------------|--|
| Project Leader(s) | Dr Nigel Bradly | Envirostrat Ltd | nigel.bradly@envirostrat.co.nz |
| Project Researcher | Dr John Reid | Canterbury University | |
| Project Researcher | Cerasela Stancu | Envirostrat | |
| Project Researcher | Fraser Stobie | Envirostrat | |
| Project Researcher | Victoria Jollands | Auckland University | |
| Peer Reviewer | Dr Nicolas Lewis | Auckland University | |

D. CO-DEVELOPED WITH

| Name | Role | Organisation / company / agency | Level of partnership |
|------------------|------|---------------------------------|----------------------|
| CLT and SS Board | | | |

E. ABSTRACT

This project will canvas and document current trajectories in blue economy innovation and development, domestically and internationally. It will map the drivers and opportunities at national and sectoral scales and provide an overview of industry perspectives (opportunities and constraints). The research will provide a baseline for developing research questions for transitioning to a blue economy and for developing the Blue Economy theme in Phase II. It will explicitly seek input from stakeholders from a range of perspectives, including both public and private sectors (including investment and finance), industry, Māori organisations, and NGOs.

F. RELEVANCE TO CHALLENGE OBJECTIVE

Fostering a blue economy is crucial to meeting the Challenge objectives. This project will provide a baseline for developing research directions for transitioning to a blue economy and for developing the Blue Economy theme in Phase II.

| G. OUTPUTS | This project will produce the following Outputs: | Linked to which Theory of Change Outputs: | Explain briefly your plan to ensure uptake by iwi and stakeholders: |
|------------|---|--|---|
| | Stocktake of significant domestic and international developments (presentation to Challenge Leadership Group) | Guidelines developed, opportunities identified and innovations supported for transitioning to a blue economy | In-depth interviews with iwi and stakeholders to document and analyse their views and incorporate them into Phase II research development. Interviews will also cultivate engagement with the BE theme. |
| | PESTLE analysis of blue economy in Aotearoa New Zealand, including mapping of current blue economy innovation landscapes and horizons | Guidelines developed, opportunities identified and innovations supported for transitioning to a blue economy | In-depth interviews with iwi and stakeholders to document and analyse their views and incorporate them into Phase II research development. Interviews will also cultivate engagement with the BE theme. |
| | Analysis of state of blue economy, including opportunities for transitioning to a blue economy and research opportunities and gaps | | Validation of insights and research opportunities and gaps through workshop with selected iwi and stakeholders. |

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| H. OUTCOMES | This project will contribute to the following Theory of Change Outcomes: |
| | The value of blue economy business transition is recognised and adopted by Aotearoa New Zealand businesses & government |

I. INTRODUCTION

In this project we examine the forces driving the development of a blue economy in New Zealand, detail what's on the horizon in terms of change and opportunities, and ask how NZ organisations are preparing for these opportunities in relation to existing innovation landscapes. A blue economy involves marine and coastal activities that generate economic value, are climate resilient and contribute positively to social, cultural and ecological well-being. This requires that they draw on ecologically, culturally and socially appropriate technologies and know-how. We ask where New Zealand is positioned in terms of trajectories of on-going innovation and change that may or may not be driving towards this vision of a blue economy and technological innovation in key sectors.

J. AIMS

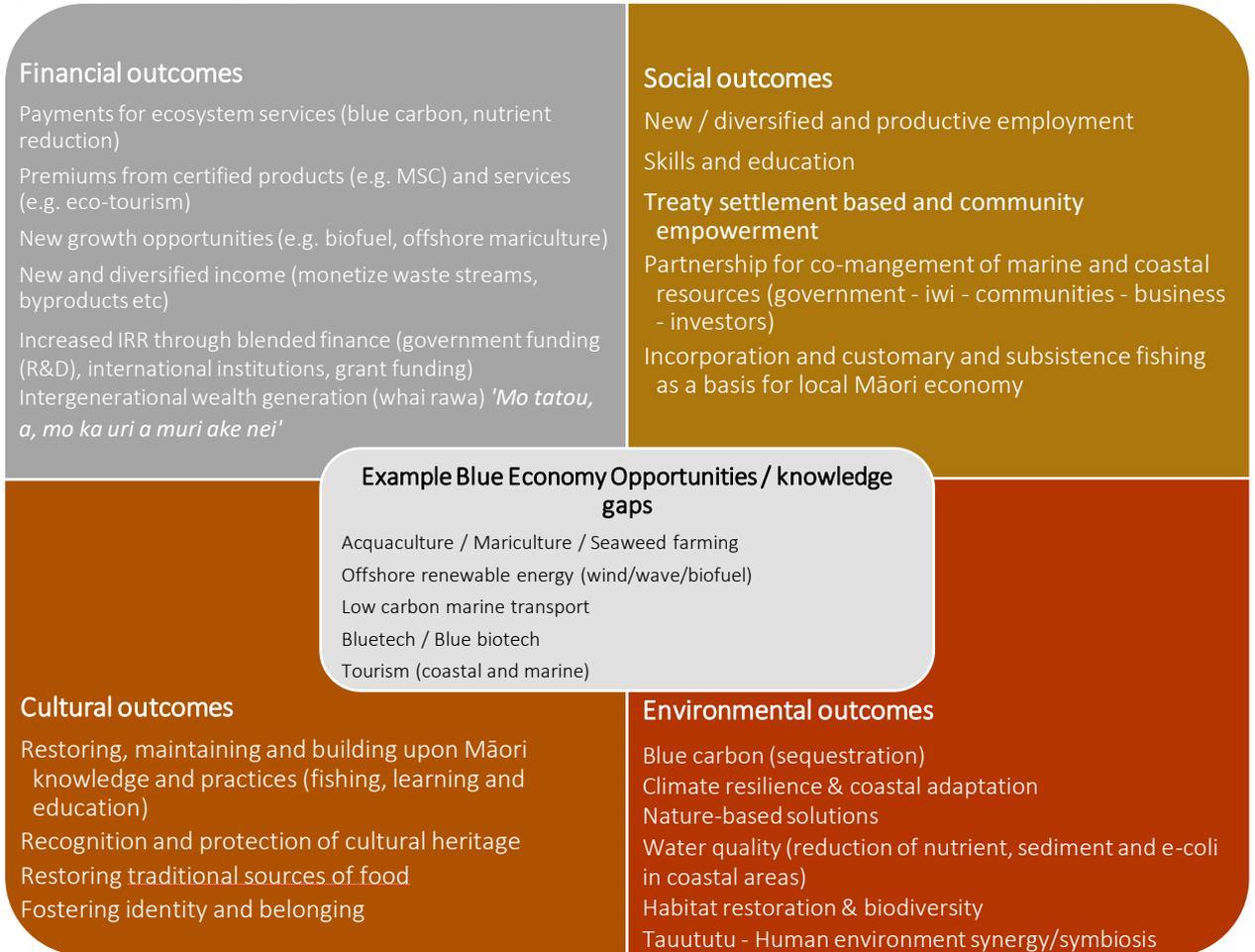
The project aims to present an account of the state of blue economy development as the Challenge enters Phase Two. It will:

1. Map the New Zealand innovation landscape for blue economy
2. Outline key trajectories of change domestically and internationally
3. Document the views of iwi and stakeholders on key sector-level and regional-level threats, opportunities and directions of change, and canvass related research requirements and needs.

K. PROPOSED RESEARCH

The project will investigate trajectories towards (and barriers to) blue economy development in NZ, and the gaps and needs that can be addressed through research i.e. research questions and priorities. It will use three methodologies to generate its findings: desktop review of grey literature, key informant interviews, and a focus group workshop. Specifically, the project will:

- (1) Use a desk-top review of the literature including the grey literature on the state of play re. blue economy development more generally, both domestically and internationally to capture the political, economic, technological, legal, social, and sector level horizons of blue economy futures (input into PESTLE analysis). This is a high level / macro-analysis (as recommended by the board) which is in alignment with four-well beings thinking

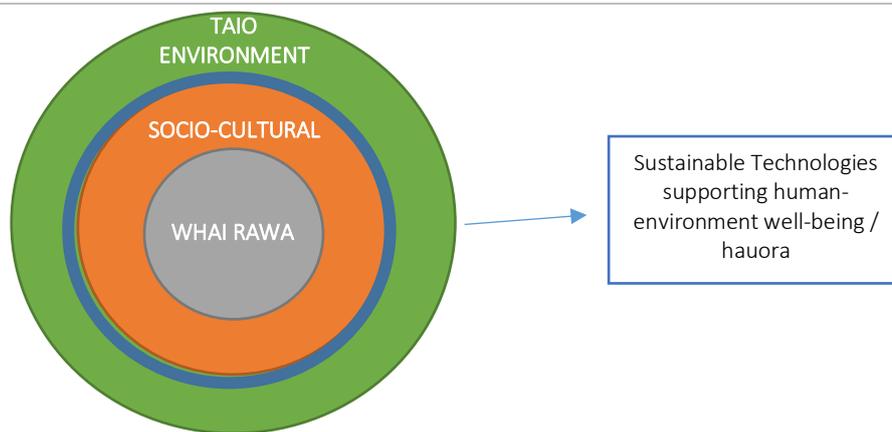


that generally informs assessments of blue economy more broadly, and the pursue of opportunities that it can generate (including understanding of knowledge and research gaps).

2. The wellbeing analysis will also be framed from a Māori perspective which views the well-beings as nested inside each other. Human-wellbeing is dependent upon environmental health (mauri ora), and in-turn long-term financial well-being (whai rawa) is dependent upon positive human-environment interactions. Technologies and innovation that allow for sustainable economic development in the marine sphere emerge through the ethical and moral choices made in the socio-cultural sphere through knowledge of Taiao (the environment). These interactions are outlined in the diagram below.

The desktop analysis will inform a series of discussions with key informants among stakeholders, so as to:

- a. identify at a more fine-grained level current sector activities and structures and innovation landscapes in New Zealand;
- b. elaborate on the initial findings and identify implications of current changes and anticipated futures for New Zealand marine sectors; and
- c. canvas stakeholder perspectives on directions of change and the potential of research and innovation to support transition & transformation.



Stakeholder interviews will be conducted via a guided discussion based around several key themes (resulting from stock-take/PESTLE on BE) rather than a rigid questionnaire format. In regards to Māori there are a diversity of stakeholders representing multiple and at times conflicting perspectives and positions. These include: marae komitis, rūnanga, Māori fishers (customary & commercial), iwi corporates, and pan-iwi collectives (e.g. Te Ohu Kaimoana). The goal is to prompt ideas and perspectives and not to limit conversations to narrow questions.

This will help map:

- emerging areas, key issues, the players, and the type and scale of innovation happening in New Zealand and abroad
- what are the evolving & emerging sectors (including finance, eco-tourism, restoration and ecosystem services economies and Māori blue economy), the opportunities and the risks to development of the blue economy. This will include considerations regarding small and medium size enterprise and not just established players in this space.
- developments in Māori blue economy and potential for these developments to lead New Zealand blue economy
- what are the (data & other) gaps and mechanisms that enable measurement of the blue economy (following systems / well-being thinking) i.e. what is the trajectory for BE.

(3) It will test draft analyses in a workshop setting with key informants and Challenge leaders.

The outcomes from Step 1 & 2 will be discussed and validated in a focus group workshop/direct meeting with key informants from among stakeholders, iwi and Challenge leaders. We will invite individuals who have an interest in science, economics and finance, innovation and the blue economy, and are keen to contribute ideas how to make science more effective in the (still evolving) blue economy agenda. The focus group will act as a prioritisation exercise to identify key research themes for Phase II of the Challenge.

The opportunity of engaging the Challenge leaders prior to the focus group is also considered as a way to strengthen collaboration amongst challenge areas.

L. LINKS TO PHASE I RESEARCH

The research will primarily draw on conceptual models and research findings from two projects from Phase I: Creating value from a Blue Economy in New Zealand, and Whai Rawa, Whai Mana, Whai Oranga: Creating a world-leading indigenous blue economy. Other Phase I research will also inform our approach, including research findings from Tūhonohono: Tikanga Māori me te Ture Pākehā ki Takutai Moana, and Whai te Mana Māori Whakahaere Tōtika ki Tangaroa – in pursuit of Māori governance jurisdiction models over marine resources.

The interviews will also involve informants who are familiar and have been involved in the phase I of the challenge, thus seeking informed opinions how to build on, and enhance the outcomes from Phase I. The involvement of Dr Lewis (as Theme Leader) and Dr Reid (as AI) in the project will ensure that learning from Phase I is incorporated into Phase II. The research will be informed by findings other Phase I projects.

M. LINKS TO & interdependencies with PHASE II RESEARCH projects

The project is a pivotal first step in the co-development of Phase II research on the Blue Economy. It will provide specific information that will help to guide development of a research programme for the Blue Economy in Phase II. It will provide baseline information on key directions of change within sectors, which will be valuable for all Phase II projects.

Baseline information will include:

- Established blue economy sectors – looking at where / how these sectors are evolving (or not).

- The key issues for the New Zealand blue economy – identifying the regulatory hurdles, Treaty settlement implications, market conditions, state of the environment, natural capital considerations, monetisation opportunities, climate adaptation.
- The key players – understanding the positions of institutions, the level of goodwill, pilot projects and types of thinking. Of particular importance will be an exploration of Māori governance, property right, and jurisdictional issues in the marine estate.
- The emerging sectors – where are the newest developments being made, and the differences between NZ and overseas?
- Innovation – identifying the main drivers and limitations for innovation and determining the level of private versus public research and development, as well as the type of innovation (e.g. technical, cultural or social innovation).
- The key risks – understanding what the main risks are to the New Zealand blue economy; examining aspects such as institutional inertia, enterprises and skills, policy & regulatory context as enablers or barriers to progress.
- The private finance and investment sector – understand the innovative financing landscape in NZ, and the transfer of know-how within our borders and offshore – including their interest in payments for ecosystem services.
- Baseline data availability – an examination of the current understandings of blue economy measurement and how we quantify the sector in New Zealand; a systems approach to measurement.

N. VISION MĀTAURANGA (VM)

The project will draw upon the detailed analysis already undertaken in the Creating an Indigenous Blue Economy project, which mapped and catalogued current Māori activity and aspirations in relation to the marine economy and identified kaitiaki-led innovations. Existing networks into iwi, pan-iwi, hapū, marae komitis, and Māori customary and commercial fishers will be drawn to access additional information where required across the four well-beings and innovations that support kaitiaki-centred economic activity. In this manner the project will support VM aspirations for hauora and matauranga Māori-centred innovations.

To strengthen the VM in the research approach, the team includes a respected Māori researcher – Dr John Reid, Ngai Tahu Research Centre at University of Canterbury, who has significant experience in the marine and broader bio-economy.

Also, Envirostrat has ongoing engagement and interaction with the Tangaroa Research Programme team and will link the findings of this work with the approaches / focus areas of Vision Matauranga.

O. ENGAGEMENT REQUIRED WITH IWI AND STAKEHOLDERS

The project will involve interviewing sector representatives and key iwi and whanau based blue economy business operators, as well as officials at MPI and MBIE. A cross-sectoral approach to the interviews will enable the researchers to develop a holistic picture of the blue economy in its current state and document a range of perspectives on the blue economy landscape within an NZ context. Approximately 30 interviewees will be reached through this research.

The Envirostrat team has a well-established network of contacts that will be utilised for this work. We maintain positive relationships across multiple relevant sectors, both domestically and internationally.

P. PROJECT COMMUNICATIONS

The project will present initial findings (stock-take of developments) and project update to CLT during September and final report early November.

Q. RISK & MITIGATION

A key risk to the project is misconception about the nature of the blue economy (being seen as solely fisheries / aquaculture focused) and negative views from industry about the relevance of the national science challenges to economic development.

This will be mitigated by the project team leveraging their deep networks across sectors, systemic analysis of issues raised and targeting of input from individuals who are knowledgeable and innovative; and the role that research can play in enabling blue economic development.

R. CONSENTS & APPROVAL required to undertake research

Envirostrat to organise peer review of research ethics (CLT members) prior to commencing field research.

S. Additional information regarding Envirostrat experience working with iwi / Māori engagement

Envirostrat and the individuals involved in this research project have a long track record of collaboration with Maori in different contexts around the country. Some of the tribes and related entities we have worked with in the past two years include: Te Rarawa, Te Aupouri, Ngai Takoto, Ngati Kuri, Ngati Hei, Maniapoto, Te Tau Ihu iwi, Ngai Tahu (Te Runanga o Ngai Tahu, as well as Awarua, Taumutu, Waewae, Tuahiwi runanga), Pare Hauraki, Ngati Paoa, Te Arawa River Iwi Trust, Waikato-Tainui, Ngati Whatua. Related entities include Ngai Tahu Seafood, Aotearoa Fisheries Ltd, Maara Moana, Te Ohu Kaimoana, Iwi Collective Partnership, Pare Hauraki Kaimoana, Waikato River Authority.

Below are selected examples of the work carried out for, and/or with iwi collaboration:

Mussel Spat Farm Investment Case – 90 Mile Beach (Client: Te Rarawa)

Preparing the Investment Case for three far north tribes for a 1,200 ha mussel spat farm 2km off 90 Mile Beach to address a critical risk to future growth of the mussel sector. Role requires engagement with iwi (Te Rarawa, Te Aupouri, other), industry, stakeholders, Aquaculture NZ and MPI, as well as potential investors. It involves strategic assessment, consideration of social, environmental, cultural and economic factors, detailed financial modelling, legal analysis and engineering design.

Business Case for Aquaculture Sector Infrastructure Investment (Client: Pare Hauraki Kaimoana / Coromandel Marine Farmers Association)

Leading Provincial Growth Funded business case seeking investment to improve infrastructure at main wharf used by the Mussel sector in the Coromandel. The lack of fit for purpose, climate change resilient infrastructure is the single greatest impediment to aquaculture sector growth in NZ with forecast volumes expected to increase by ~100,000 tonnes per year in coming decades.

Monetising Restoration of Te Waihora (Client: Te Runanga o Ngai Tahu)

Engaged by Te Runanga o Ngai Tahu to prepare a restoration strategy for Te Waihora and surrounding catchment as current approaches that rely on government grants are not having the required impact on the highly impacted estuarine lake and catchment. The work is focusing on innovative approaches to monetising and scaling restoration through payment for ecosystem services including carbon forestry, trialling blue carbon within the lake, use of freshwater / brackish macroalgae for nutrient removal, wetland creation for both water quality and biodiversity impact, as well as environmental impact investment.

The Impact of Policy on Sustainable Land Use Choices in NZ: a Think-piece for Our Land & Water National Science Challenge (Partner in project – Maniapoto, peer reviewed by OLW Kahui lead)

Led a thinkpiece that tested the proposition that current national and regional policy frameworks, and their implementation, may act as barriers to the Our Land and Water National Science Challenge (OLW) achieving its objective “To enhance primary sector production and productivity while maintaining and improving our land and water quality for future generations”. The reason being, that these frameworks, including how they are implemented, may discourage (or insufficiently encourage) change at the scale and diversity needed.

Feasibility of seafood sector Impact Investment in the Hauraki Gulf (collaborator in project Aotearoa Fisheries Ltd)

Led a study, funded by *Foundation North*, into the feasibility of impact investment to provide the pathway to a high value, low impact commercial fishing sector in the Hauraki Gulf. This included several elements of the fishery sector; shelving fishing quota, converting the current trawling fleet to more sustainable methods, development of high value salt water fly fishing tourism, development of fin fish aquaculture, and the creation of a sustainable fishery brand for the Hauraki Gulf. The project team involved iwi experts the project involved consultations with iwi in Hauraki Gulf, including fishing companies like Moana.

Impact Investment in the Waipa Catchment (Client: Waikato River Authority, collaborator - Maniapoto)

Leading an environmental impact investment project to transform land use and reduce environmental degradation caused by agricultural development, whilst generating commercial returns for project investors. The project will acquire \$150-200M worth of conventional dairy farms in the environmental ‘hot spots’ within the Upper Waipa Catchment. It will convert the farms to organic dairy and other land use mixes to generate increased revenue, and will fund significant environmental investment on farms to reduce nutrients, e. coli, sediment and greenhouse gases by 40-65% on farm and up to 5% of total catchment load. The project was carried out with support and input from Maniapoto.

Tai Timu Tai Pari Sea Change – New Zealand’s first Marine Spatial Plan. (co-governed with Hauraki Gulf iwi)

Lead Author of New Zealand’s first Marine Spatial Plan, in the Hauraki Gulf. Sea Change was a collaboratively developed marine spatial plan using an Integrated Coastal Zone Management approach with a partnership between commercial sectors, local tribes and regional and central government. Sea Change had a focus on spatial and strategic prioritisation for commercial fishing, new marine protected areas, water quality improvements, and growth of aquaculture. Key to its

success was the integration across different levels of government (national and regional), across the land / sea interface, and across different economic sectors. The implementation pathways include regulatory reform, impact investment in key sectors, and empowerment of local community and tribal groups.

Ngai Tahu response to Chatham Rock Phosphate (Client Ngai Tahu Seafoods, collaborators – Te Ohu Kaimoana, Moriori, Ngati Mutunga, Ngati Kahungunu)

Successfully led the response to a proposal for deep sea phosphate mining on the Chatham Rise, NZ on behalf of Ngai Tahu and in collaboration with Te Ohu Kai Moana, DOC and the Deepwater Group. Developed and executed a strategy to refute the evidence presented by the applicant through a 3 month hearing process, including engaging and managing experts in economics, ecology, ecotoxicology, planning, and international best practice. There were a number of unresolved issues, including the impact on existing fisheries and cultural interests, the need for adaptive management in the context of very large infrastructure development, restoration techniques using the precautionary principle, and the reliance of modelling as a proxy for baseline environmental information in a deep sea environment.

Preparation of a Restoration Strategy for the Waipa and Waikato River Catchment (Client: Waikato River Authority, codesigners and collaborators – Waikato-Tainui, Maniapoto, TARIT, Raukawa, Tūwharetoa)

Led the development and drafting of a long term action plan that will prioritise and guide \$300M of future investment in restoration activities for the Waikato River Authority, the Waikato iwis (Tūwharetoa, Maniapoto, Te Arawa, Raukawa and Waikato-Tainui), councils and industry. It will ultimately provide for the attainment of the Vision and Strategy for the Waikato River, which is the guiding document that underpins freshwater management in NZ's largest watershed.