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## Building a business case for investment in a coconut industry in the Pacific

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3. Samoa Ministry of Agriculture & Fisheries
4. Vanuatu Department of Industry

Throughout the course of this research project, we consulted with a number of for-profits, non-profits, and NGOs. These organisations provided valuable context, and shaped the discussion of both the 'problem', and the recommended approach for developing solutions. We thank them for generously contributing their time and expertise:

1. CSIRO
2. DFAT
3. Fiji Coconut Millers
4. Fiji Kava.
5. Kokonut Pacific
6. PHAMA Plus
7. World Bank

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# 1 Executive summary

Coconut is partway through a meteoric rise in consumer and commercial popularity, with the industry tipped to exceed US\$30B by 2026 (a tripling in size from 2018). Despite this phenomenal growth in demand, production in the Pacific has plummeted, attributed to the volatile and falling commodity coco-oil price, as well as the increasing senility of Pacific trees (with over 50% of the Pacific's 1.3 million coconut trees estimated to be 'senile' or 'unproductive').<sup>1</sup>

The Pacific's most abundant food resource has for generations provided both food security and meaningful income for communities: financing construction, schooling, transportation, and leisure. The "apparent disinterest" in replanting programs, with "very little replanting...in the last 3-4 decades" places the Pacific coconut industry, and the livelihoods it supports, at enormous risk<sup>2</sup>. The reasons underpinning this disinterest have been described as the "key question in Pacific Island Countries (PIC) coconut research and development".<sup>3</sup>

While growing the PIC coconut industry requires solving technical challenges (e.g. eradicating or reducing the impact of key pests, producing and distributing quality planting material, offsetting the effects of climate change), it also requires us to solve human and commercial puzzles. Unless we have an understanding of what's driving the behaviour of smallholders and larger producers, the real-world impact of technical achievements will continue to be dampened.

It is the human and commercial elements that were the focus of this project. Through the use of IDEO's *Human Centred Design* principles, and the *Science-Based Lean LaunchPad methodology* pioneered by Stanford University and the American National Science Foundation (NSF), this project formed a sophisticated understanding of the forces impeding industry growth and profitability, and proposes a strategy for the transformation of the Pacific coconut industry.

Through 74 in-depth qualitative interviews (representing approximately 100 hours of conversation) conducted by the UQ Project Team and by research partner organisations across Samoa, Vanuatu, and Fiji, a bleak and consistent picture emerged of the current trajectory of Pacific coconut production.

Despite coconut's abundance across the Pacific and its cultural, historical, and domestic significance, it no longer plays a meaningful role in economic life. Coconut oil's exposure to falling global commodity prices has greatly decreased its effectiveness as a supplementary income stream, and decentivises investment in both baseline replanting and production expansion.

Production in the Pacific faces stiff competition from so-called 'cash crops' (such as kava and cocoa) that are less labour intensive, vastly more profitable, and have a shorter time-to-harvest, as well as from other agricultural pursuits (fishing and livestock). Coconut planting and harvesting are perceived as being highly labour intensive, with emigration and seasonal worker programs in Australia and New Zealand competing for the Pacific's labour pool.

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<sup>1</sup> McGregor, A. & Sheehy, M. *An overview of the market for Pacific Island coconut products and the ability of industries to respond*. 2017. Page 4.

<sup>2</sup>AECOM. *Coconut Sector Review*. 2019. Page 21.

<sup>3</sup> Ibid.

International aid and development agencies, many of whom have attempted for decades to leverage Pacific coconut to increase the livelihoods of local communities, identified significant barriers to meaningful progress. They pointed, in particular, to the fragmented nature of production, poor transport infrastructure, competition with highly sophisticated regions (SE Asia and India), and the Pacific's geographical distance from global supply chains. This combination of factors means the Pacific will never compete on price alone.

There is no doubt that coconut plays an emotional, social, traditional, and quasi-mythological role in Pacific communities. The 'tree of life' is not simply a commodity, but is rather intertwined within the fabric of daily life and ritual. Coconut is unlikely to disappear entirely from life in the Pacific Islands, though if it is to play a meaningful role in supporting the livelihoods of these communities a significant change in trajectory is required.

Furthermore, in the absence of the creation and expansion of higher-value opportunities, the continued decline of Pacific coconut may increase the reliance of Pacific economies on international donations, sponsorship and aid.

The greatest barriers to a rejuvenated Pacific coconut industry are not senility, pests, climate, planting materials, a lack of varieties, or agronomic knowledge. Such factors featured little and only tangentially in our open-ended conversations. Instead, the greatest barrier is the absence of economically meaningful opportunities for harvested coconut. Unless higher-value opportunities can be identified, grasped, and scaled, it is unlikely that we will see coconut play anything more than a domestic and ritualistic role across the Pacific.

Only coconut product and business model innovation will allow the Pacific to escape the vortex of commoditisation. If successful it will enable growers to convert a low-value commodity into high-value consumer products, and it is the key to capturing higher economic value and returning this to Pacific communities. To have meaningful impact, this product innovation needs to be replicable and to operate at scale. This project developed an example enterprise, *The Pacific Coconut Miracle innovation initiative (PCMii)*, to demonstrate how the industry could be reconfigured to increase production and achieve Pacific-wide impact.

The Pacific Coconut Miracle innovation initiative, or one like it, could transform the Pacific: creating jobs, exports, and tourism, while stimulating production and processing investment through liberating the untapped value of the Pacific's most abundant food resource.

This style of initiative represents a new paradigm for aid and development empowerment that marries western consumer insights, product & business model innovation expertise, and global capital & market access with donor country owned and operated startups. If successful, this type of model could reach across the globe, allowing nascent businesses in donor countries to achieve an escape trajectory from commoditisation.

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## 2 Background

Coconut is partway through a meteoric rise in consumer and commercial popularity, with the industry tipped to exceed US\$30B by 2026 (a tripling in size from 2018). Despite this phenomenal growth in demand, production in the Pacific has plummeted, attributed to the volatile and falling commodity coco-oil price, as well as the increasing senility of Pacific trees (with over 50% of the Pacific's 1.3 million coconut trees estimated to be 'senile' or 'unproductive'.)<sup>4</sup>

Despite ostensibly strong macroeconomic coconut production incentives, research has consistently shown that "very little replanting has occurred [in the Pacific] in the last 3-4 decades"<sup>5</sup>. Understanding the reasons behind the "apparent disinterest" in replanting has been described as a "key question" in Pacific Island Countries (PIC) coconut research and development<sup>6</sup>. If global demand for coconut is increasing, why, then, do we not see a corresponding increase to production in the Pacific?

While growing the PIC coconut industry requires solving immense technical challenges (e.g. eradicating or reducing the impact of key pests, producing and distributing quality planting material, offsetting the effects of climate change), it also requires us to solve human and commercial puzzles. Unless we have an understanding of what's driving the behaviour of smallholders and larger producers, real-world impact of technical achievements will continue to be dampened.

It is the human and commercial elements that were the focus of this project. Through the use of IDEO's *Human Centred Design* principles, and the *Science-Based Lean LaunchPad methodology* pioneered by Stanford University and the American National Science Foundation (NSF), this project formed a sophisticated understanding of the forces impeding industry growth and profitability, and proposes a strategy for the transformation of the Pacific coconut industry.

If the Pacific is to take advantage of market tailwinds in order to grow (or even sustain) the coconut industry, we need to be able to speak as fluently about the behavioural and commercial challenges as we do about the technical. This project is a step in that direction.

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<sup>4</sup> McGregor, A. & Sheehy, M. *An overview of the market for Pacific Island coconut products and the ability of industries to respond*. 2017. Page 4.

<sup>5</sup>AECOM. *Coconut Sector Review*. 2019. Page 21.

<sup>6</sup> Ibid.

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## 3 Objectives

**Objective 1: Develop a strong evidence-base for ACIAR on the viability of the coconut industry in the Pacific.**

Underlying Research Questions:

- i. What can we learn from: i) previous R&D work done in PIC by ACIAR, as well as ii) complementary research or initiatives undertaken by governments, industry, or other organisations/institutions?
- ii. What are the barriers to smallholders replacing senile palms? What is the 'lived experience' of smallholders?
- iii. What business model interventions/solutions could potentially overcome barriers to smallholder replanting, coconut production & industry growth in the Pacific?
- iv. Therefore: is there a compelling business case that could stimulate investment in the PIC coconut industry? (e.g., from smallholders, government, NGOs, or industry)

**Objective 2: Build in-country capability in ethnographic research methodology.**



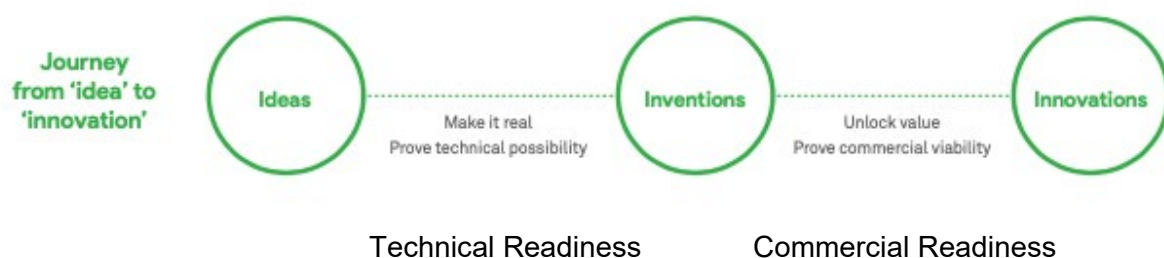
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## 4 Methodology

### *The Limits of Purely Technical/Scientific Solutions*

While scientific advances such as coconut drought and pest resistance will play a role in the rejuvenation of Pacific Island coconut industries, it will be far from the whole story. Value from scientific research (and from innovation in general) is returned at the end of a multi-step process that requires not only a technical breakthrough, but also a commercial one. This argument is made in Kastle & Steen's 2011 paper: *Ideas are not Innovation's* (Kastle & Steen, 2011).

In this paper, the authors offer a tripartite definition of innovation: *Innovation is the execution of new ideas to create value*. Broken down into its parts, this definition is highly descriptive of the process by which research is translated into value for communities, and addresses some of the typical ways in which this goes awry. The process for value creation from research looks like this:



First (most commonly in a lab and in follow-on field experiments), an idea is made 'real' as its technical possibility is demonstrated. The result is an invention, and too often this is where the journey ends. While inventions are a necessary part of the value-creation process, a further step is required to extract real-world value from the breakthrough. If research is to drive impact, our inventions must be accompanied by a commercial value 'unlock'; only then can we say that innovation has occurred.

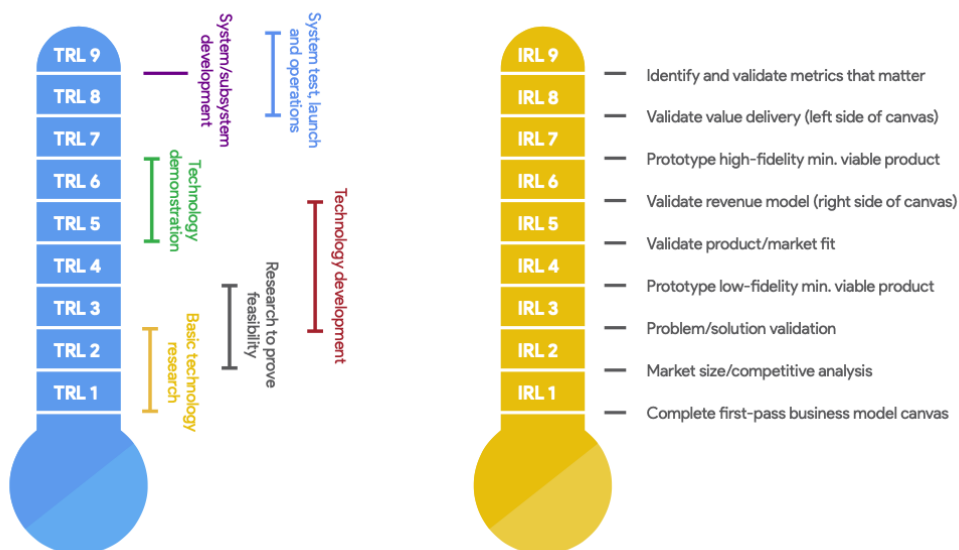
The path from 'idea' to 'invention' is captured within the Technical Readiness Levels (the TRLs). The TRLs were developed by NASA in the 1970s to pinpoint the current maturity of new technologies, and to describe what inventors need to do next to mature them. The TRLs are today used worldwide at NASA, the US Department of Defence, The European Association of Research and Technology Organisations (EARTO), and The European Space Agency.

The most profound change in best practice commercialisation over the past 10 years has been the realisation that the path from 'invention' to 'innovation' has its own distinct steps, and that technical possibility and commercial viability should be addressed not sequentially but in tandem. To illustrate this intertwinement, Stanford's Steve Blank developed the Investment Readiness Levels (the IRLs). While the TRLs demonstrate how to make an idea real, the IRLs give us confidence that we are solving the right problem, with the right solution, and that enough people care for us to build a sustainable business model.

## Technology Readiness Levels

+

## Investment Readiness Levels



The parallel consideration of technical and commercial risk is the surest way to drive impact from research. Unlocking commercial value is in itself a creative process, and one that requires a fundamentally different skill-set from that typically cultivated by scientists. An enormous amount of technical research has been done on coconut production in the Pacific Islands, but very little has been done to leverage this research to create value for and with these communities. Scientific acumen needs to be married with commercial acumen and an understanding of theories of behavioural change if we are to unlock value and impact.

Lean LaunchPad marries technical/scientific breakthroughs with human-centred design, ethnography, and anthropological excursions, allowing us to develop deep empathy for customers and beneficiaries, and therefore to design interventions that will work in the ‘real world’. As Bill Gates says: “If we have optimism without empathy then it doesn’t matter how much we master the secrets of science. We’re not really solving problems, we’re just working on puzzles”<sup>7</sup>.

### Introduction to Lean LaunchPad

Lean LaunchPad (LLP) was developed in 2011 by Steve Blank and the Stanford Technology Ventures Program<sup>8</sup>. In its initial formulation, LLP was taught as a capstone at Stanford GSB

<sup>7</sup>Lowe, A. Norris, A.C., and Farris J. “Quantifying Thematic Saturation in Qualitative Data Analysis”, *Field Methods*, Vol. 30 Issue 3, August 2018. pp. 191-207

<sup>8</sup> Blank, S. *The Lean LaunchPad Class: It’s the same, but different*. 2019. Retrieved: <https://steveblank.com/2019/03/26/the-lean-launchpad-class-its-the-same-but-different/>

and was designed to increase an entrepreneur's chances of success by having them engage with potential customers *before* building their product or service. This change in emphasis from business 'planning' (projections in spreadsheets) to systematic business 'validation' (getting out of the building and talking to real people) was widely heralded as revolutionary<sup>9</sup>.

While the first version of LLP was entrepreneur, startup, and business focussed, it took just 90 days from the first class being taught at Stanford for Steve Blank and the American National Science Foundation (NSF) to adapt it for the nation's top scientists (calling this program the Innovation Corps, or I-Corps)<sup>10</sup>. I-Corps gears researchers and research projects towards commercialisation and impact, using LLP tools to encourage engagement early and often with industry and other 'problem-owners' in order to "reduce the time to translate a promising idea from the laboratory to the marketplace"<sup>11</sup>. A program manager at NSF described the decision to adopt LLP as follows: "It's all about how to apply the scientific method to market-opportunity identification... and that is exactly why this method is the one the NSF selected"<sup>12</sup>.

We know that **Most Innovations Fail** in all sectors, public, private, and nonprofit, with 11 out of 12 startups and 19/20 product innovations failing<sup>13</sup>. Lean LaunchPad is best-practice for combating these high rates of failure, and has been embraced by researchers, corporations, aid & development agencies, and governments alike.

### *Science-based LLP in Australia: A strong foundation*

The success of I-Corps in the United States naturally raised the question as to whether the approach could work in Australia. The largest and most successful application of the LLP methodology in Australian Science has been the CSIRO ON Prime Program<sup>14</sup>. The CSIRO ON Prime Program was developed in 2015 by Tim Kestelle and others at the request of then-CEO Larry Marshall.

There are differences to how the Australian and American programs operates, differences due primarily to the relative immaturity of the Australian innovation ecosystem (particularly in access to "venture capital, density of entrepreneurial firms and mentors, size of the economy, and access to international markets")<sup>15</sup>.

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<sup>9</sup> Blank, S. "Why the Lean Start-Up Changes Everything", *The Harvard Business Review* (May 2013).

<sup>10</sup> Blank, S. *The Lean LaunchPad Class: It's the same, but different*. 2019. Retrieved: <https://steveblank.com/2019/03/26/the-lean-launchpad-class-its-the-same-but-different/>

<sup>11</sup> National Science Foundation. *I-Corps*. Retrieved [https://www.nsf.gov/news/special\\_reports/i-corps/](https://www.nsf.gov/news/special_reports/i-corps/)

<sup>12</sup> Lohr, S. "With a Leaner Model, Startups Reach Further Afield", reported in *The New York Times*, December 5. 2011. Retrieved: <https://www.nytimes.com/2011/12/06/science/lean-start-ups-reach-beyond-silicon-valleys-turf.html>

<sup>13</sup> UQ. *Why startups fail & what to do about it*. 2022. Retrieved: <https://future-students.uq.edu.au/stories/why-startups-fail>

<sup>14</sup> Kestelle, T., King, S., Verreynne, M-L. and Kambouris. "Experiences using a science-based Lean LaunchPad program and its impact on national innovation system evolution" *Int. J. Entrepreneurship and Small Business*, Vol. 35, No. 3. 2018. pp.356–370.

<sup>15</sup> Ibid. Page 368.

Since 2015 ON Prime has trained over 3,000 researchers, worked with over 40 Universities, supported the creation of 61 new companies, and attracted more than \$73m in commercialisation grants and venture funding<sup>16</sup>.

The success of CSIRO ON Prime has demonstrated that a science-based LLP can work within the Australian context, and that the methodological principles are geographically transferable despite contextual differences and caveats.

### *Key methodological tenets:*

The key methodological tenets of a science-based Lean LaunchPad are:

1. Placing a deep emphasis on the 'problem to be solved': LLP places an emphasis on deeply understanding the problem to be solved in-context before designing potential solutions. It uses a variety of ethnographic/qualitative research techniques to reach this understanding, including but not limited to: surveys, structured and semi-structured interviews, journey mapping, diaries, shadowing, and scenario formulation/games.

While desktop research and the synthesis of reports remains an important part of the innovation process, typically novel and transformative insights are drawn from ethnographic/qualitative work, which drills down into people's motivations, mental models, and decision-making criteria.

2. Embracing Human-Centred Design: Increasingly, best practice in designing 'for' people is understood to be designing 'with' people. Lean LaunchPad embraces IDEO's approach to Human-Centred Design for social and economic change.

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<sup>16</sup> CSIRO. *CSIRO ON Prime - About*. 2020. Retrieved: <https://www.csiro.au/en/Do-business/Programs-funding/CSIROs-ON-program/About>

# What Does It Mean to Be a Human-Centered Designer?

Embracing human-centered design means believing that all problems, even the seemingly intractable ones like poverty, gender equality, and clean water, are solvable. Moreover, it means believing that the people who face those problems every day are the ones who hold the key to their answer. Human-centered design offers problem solvers of any stripe a chance to design with communities, to deeply understand the people they're looking to serve, to dream up scores of ideas, and to create innovative new solutions rooted in people's actual needs.

At IDEO.org and IDEO, we've used human-centered design for decades to create products, services, experiences, and social enterprises that have been adopted and embraced because we've kept people's lives and desires at the core. The social sector is ripe for innovation, and we've seen time and again how our approach has the power to unlock real impact. Being a human-centered designer is about believing that as long as you stay grounded in what you've learned from people, your team can arrive at new solutions that the world needs.

- 
3. 'Thick data' and the search for thematic saturation: While big data can be described as quantitative data at scale, "Thick Data is data brought to light using qualitative, ethnographic research methods that uncover people's emotions, stories, and models

of their world”<sup>17</sup>. When using qualitative & ethnographic research methods, researchers aren’t looking for ‘statistical significance’, but rather ‘thematic saturation’, i.e. the point “at which observing more data will not lead to [the] discovery of more information related to the research questions”<sup>18</sup>. Research suggests that thematic saturation can be achieved after six or seven in-depth interviews<sup>19</sup>.

4. Taking a ‘hypothesis-led’ approach: LLP revolves around the surfacing and testing of hypotheses<sup>20</sup>. Through every stage project teams unpack, record, and test hypotheses - validating or invalidating each one as the project progresses.
5. Developing ‘Business Model’ solutions/interventions: Real-world problems, and especially those that are entrenched, persistent, multi-variant, and systemic, are rarely solved through single-point solutions or interventions. Using tools such as the Business Model Canvas allows project and research teams to ensure that potential solutions are rigorous enough to work ‘in the real world’ (or ‘in-context’), and not just on paper.

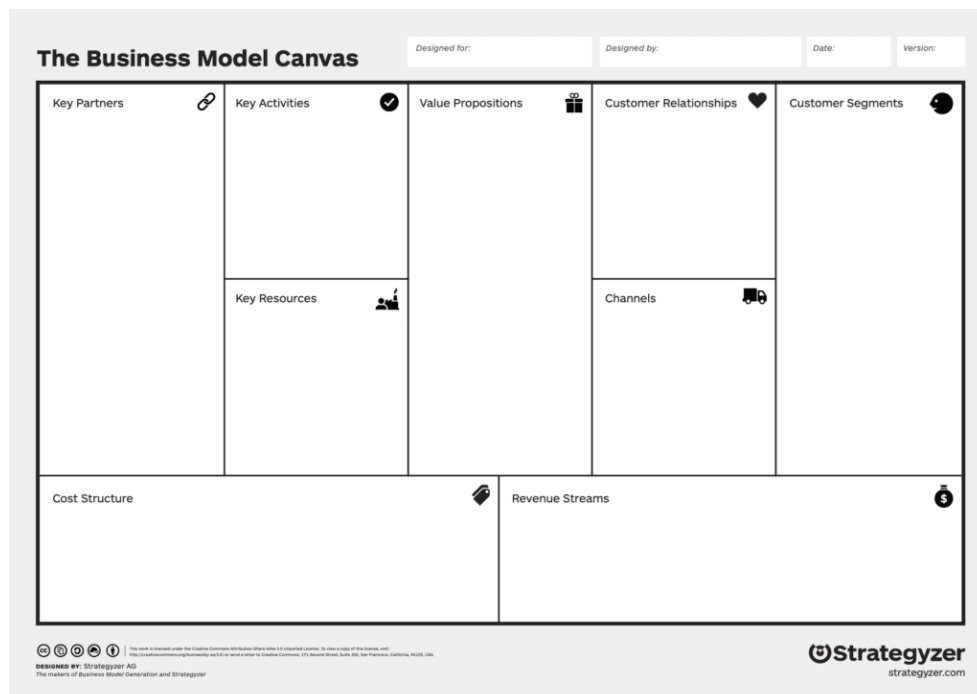


Figure 1: The Strategyzer Business Model Canvas<sup>21</sup>

<sup>17</sup> Tricia Wang, “Why Big Data Needs Thick Data”. Medium. 2016. Retrieved: <https://tinyurl.com/2p8ds9ds>

<sup>18</sup> Lowe, A. Norris, A.C., and Farris J. “Quantifying Thematic Saturation in Qualitative Data Analysis”, *Field Methods*, Vol. 30 Issue 3, August 2018. pp. 191-207

<sup>19</sup> Ibid.

<sup>20</sup> Kastelle, T. *The Magic in Lean Startup is Hypothesis Testing*. 2016. Retrieved: <https://timkastelle.org/blog/2016/06/the-magic-in-lean-startup-is-hypothesis-testing/>

<sup>21</sup> Strategyzer. *The Business Model Canvas*. Retrieved: <https://www.strategyzer.com/canvas/business-model-canvas>

A business model solution or intervention is one that is:

- a. Desirable: Solves the right problem in a way that unlocks significant value for participants (organisations, customers, stakeholders, and communities).
  - b. Viable: Makes financial sense to all participants, with the desired outcome properly incentivised and scalable.
  - c. Feasible: Will work 'in-context'/on the ground.
6. The use of Minimum Viable Products (MVPs) to quickly and cheaply test potential solutions: A MVP is primarily a tool for learning, allowing teams to test key solution hypotheses in-market while maintaining speed and keeping costs low. A MVP allows teams to demonstrate (or hint towards) the key value of a solution, thereby testing it with relevant 'customers' or 'end-users' without developing it on a commercial scale.

### *Compatibility with ongoing technical/scientific research:*

Lean LaunchPad complements, rather than stands in opposition to, the scientific and technical coconut research conducted by ACIAR and others.

<b>Traditional Research Methodology</b>	<b>Lean LaunchPad Methodology</b>
Emphasis on large data-sets, on quantitative data, and on figuring out 'what' people are doing.	Emphasis on small data-sets, on ethnographic data, and on figuring out 'why' people behave in certain ways.
Search for 'statistical significance', i.e. the attribution of data to specific causes (as opposed to chance).	Search for 'thematic saturation', i.e. the point "at which observing more data will not lead to [the] discovery of more information related to the research questions" <sup>22</sup> .
Solutions are described and proposed, but testing them typically sits out of scope.	Through the use of experiments/small-scale trials, potential solutions are tested 'in-market'/in the real world, greatly increasing the rate of learning and the confidence in the solution.
Solutions proposed are often theoretical.	Solutions are deeply practical and embrace innovative business models, considering the entirety of how value is created, captured, and exchanged.

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<sup>22</sup>Lowe, A. Norris, A.C., and Farris J. "Quantifying Thematic Saturation in Qualitative Data Analysis", *Field Methods*, Vol. 30 Issue 3, August 2018. pp. 191-207

### **Project Implementation**

Coconut Livelihoods deployed the science-based LLP methodology in an international train-the-trainer model, with research partners in Vanuatu, Samoa, and Fiji conducting much of the qualitative field work that underpins the findings and recommendations presented in this report.

The project progressed as follows:

1. The UQ project team brought together research partners in Vanuatu, Samoa, and Fiji for a one-day induction and training session, unpacking the project context and upskilling international counterparts in hypothesis formation and qualitative interviewing techniques.
2. The UQ project team worked with our international counterparts to set the key project hypotheses; in particular, research partners were asked to capture why, in their opinion, replanting of coconut trees *is not* occurring, or is occurring at low rates.
3. The UQ project team then worked with each research partner to develop an interview script that would formally test these hypotheses through qualitative work with smallholders.
4. The research partners then conducted interviews, collated their results, performed an initial analysis on results, and fed their interview transcripts and preliminary findings back to the UQ project team for further analysis.

The UQ project team complemented the field-work of our international counterparts through:

1. Conducting qualitative interviews with: international aid & development agencies operating in the Pacific, successful Pacific entrepreneurs in the food & agriculture space, management of milling/processing facilities, and commercial coconut farmers.
2. Guiding a team of three UQ MBA Students (completing the Entrepreneurship Capstone) through a semester-long LLP program designed to uncover potential commercial opportunities for PIC coconuts. This team was asked to consider the 'demand'/pull side of the PIC coconut equation, i.e. to assume supply and to focus on building an attractive consumer value proposition.



### ***The Impact of COVID-19 and the Samoan Constitutional Crisis***

The Coconut Livelihoods project encountered significant difficulties and delays as a result of the global COVID-19 pandemic, and the Samoan Constitutional Crisis. These events made connecting with the international research partners difficult, and adversely affected both the number of interviews partners were able to complete, as well as the number of group training sessions able to be held.

While interview numbers were lower than planned, crucially we were able to meet the sample size typically required to reach thematic saturation (6-7 in-depth qualitative interviews), in each of the Pacific Island Countries<sup>23</sup>.

The UQ project team also expanded their own activities to offset the difficulties faced by international partners through supplementing partner interviews with their own, and through engaging a team of UQ MBA students to explore the demand-side of the PIC coconut equation.

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<sup>23</sup> Lowe, A. Norris, A.C., and Farris J. "Quantifying Thematic Saturation in Qualitative Data Analysis", *Field Methods*, Vol. 30 Issue 3, August 2018. pp. 191-207

## 5 Achievements against activities and outputs/milestones

**Objective 1: Develop a strong evidence-base for ACIAR on the viability of the coconut industry in the Pacific.**

no.	Activity	Outputs	Completion Date
1.1	What can we learn from: i) previous R&D work done in PIC by ACIAR, as well as ii) complementary research or initiatives undertaken by governments, industry, or other organisations/institutions?	Used to increase contextual understanding of the UQ project team.	January 2021
1.2	What are the barriers to smallholders replacing senile palms? What is the 'lived experience' of smallholders?	List of barriers to replanting by country. Presented in Section 6 of this report.	November 2021
1.3	What business model interventions/solutions could potentially overcome barriers to smallholder replanting, coconut production & industry growth in the pacific?	Discussion of the attributes of successful business models (Product Innovation Showcase), and the particulars of a Pacific Coconut solution (Solution Design Principles). Presented in Section 6 of this report.	February 2022
1.4	Therefore: is there a compelling business case that could stimulate investment in the PIC coconut industry? (e.g., from smallholders, government, NGOs, or industry)	Presentation of a potential business case to stimulate investment in the PIC coconut industry (PCMii). Presented in Section 6 of this report.	February 2022

**Objective 2: Build in-country capability in ethnographic research methodology.**

no.	Activity	Description	Completion Date
1. 1	Kick-off Meeting	The research project leaders from each collaborating organisation were brought together to outline project purpose and methodology.	31 March 2021
1.2	Full-team Ethnographic Training Session 1	All team members from each collaborating organisation were brought together for a 4-hour interactive workshop where they were upskilled on best practice ethnographic research techniques.	30 April 2021
1.3	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	7 May 2021

1.4	Full-team Ethnographic Training Session 2	All team members from each collaborating organisation were brought together for a 4-hour interactive workshop where they were upskilled on best practice ethnographic research techniques.	14 May 2021
1.5	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	21 May 2021
1.6	Research Partner Check-In	Following delays occasioned by COVID restrictions and the Samoan constitutional crisis, the team reconvened to set adjusted project completion dates.	4 August 2021
1.7	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	11 August 2021
1.8	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	18 August 2021
1.8	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	25 August 2021
1.9	Final Submission of Primary Ethnographic Research	Research Partners submitted their final data for analysis.	26 November 2021
1.10	Report Feedback & Amendments	All partner organisations were provided with the draft final report and were given the opportunity to suggest amendments.	23 March 2022

## 6 Key results and discussion



### Key Findings

#### Supply-side findings: Why is coconut production falling?

##### Insight:

The majority of smallholder grown coconut in the Pacific is used for household consumption (food, materials, livestock feed), and as a supplementary income stream.

Coconut that is surplus to domestic/local consumption is primarily sold to processors who convert the majority into coconut oil (a low-value global commodity).

While coconut maintains enormous cultural and historical significance, its role in economic life is dwindling.

Exposure to falling global commodity prices has greatly decreased coconut's effectiveness as a supplementary income stream for smallholders.

Coconut faces increasing competition from 'cash crops' that are less labor intensive, more profitable, and have a shorter time-to-harvest, as well as from other agricultural pursuits.

Hybrid coconut varieties introduced by donor agencies are perceived as inferior to local 'tall' varieties, especially in their resistance to cyclones and their meat yield.

Government & aid interventions have largely focussed on the distribution of seedlings, most of which go unplanted unless an additional financial incentive is attached to bringing the trees to maturity.

Vast amounts of coconut growing on so-called 'caretaker' plantations goes unharvested; emigrants are largely of the opinion that doing so wouldn't provide return on investment.

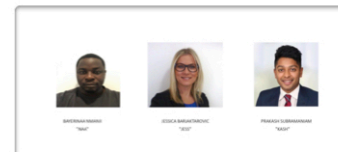
Emigration and seasonal worker programs in Australia & New Zealand have decreased the Pacific's labor pool of young/able-bodied workers who traditionally fuelled the industry.

##### Uncovered by:

Vanuatu Fiji Samoa



#### Demand-side findings: How can we create more value from Pacific coconuts?



MBA Entrepreneurship Team: Bayerinaa Nmanii, Jessica Barjaktarovic, and Prakash Subramaniam



Led and guided by The UQ Project Team

##### Macro-Trend & Market Analysis

Global coconut market experiencing strong growth, growing from \$11.5B in 2018 to an estimated \$31.1B in 2026 with a CAGR of 13.6%

The macro trends of health and wellness, provenance, ethical consumption, and single-ingredient foods provide significant tailwinds.

##### In-Depth Customer Interviews

A Pacific coconut product would provide significant functional, emotional, and social/self-transcendent benefits to customers, all of which were validated through extensive customer interviewing.

##### Value Proposition Design & Testing

*Value Proposition: Made from 100% pacific island coconuts, our healthy product helps remote pacific island communities by guaranteeing higher returns to local farmers and their communities.*

##### MVP Design & Testing

MVP testing (in this instance, a mock product landing page), provided further validation that customers would pay a premium for a natural, ethical product that supports Pacific communities.

##### Business Model Development

Product Innovation is necessary to transform coconut from a low-value commodity to a high-value consumer product.

Success requires capitalisation on the Pacific's enormous brand equity, and on the goodwill of the international community.

##### Financial Analysis

Financial analysis suggests that a viable business model can be built around a Pacific coconut product that *returns 20% of profits* to growers and their communities through a profit sharing arrangement.

## ***Supply-Side Findings***

The supply-side findings were uncovered through the 74 in-depth qualitative interviews (representing approximately 100 hours of conversation) conducted by the UQ Project Team and by the international partner research organisations. The interview breakdown, by research partner, was as follows:

- UQ Project Team: 10 interviews.
- Vanuatu Department of Industry: 10 interviews.
- Fiji National University: 10 interviews.
- Fiji Ministry of Agriculture: 10 interviews.
- Samoa Ministry of Agriculture & Finance: 33 interviews.

While interview numbers were lower than anticipated due to the effects of the Covid-19 Pandemic and the Samoan constitutional crisis, each research partner was able to achieve the amount of interviews typically required to reach ‘thematic saturation’, i.e. the point “at which observing more data will not lead to [the] discovery of more information related to the research questions<sup>24</sup>”.

### ***Summary of Findings***

Despite coconut’s abundance across the Pacific and its cultural, historical, and domestic significance, its role in economic life is dwindling. The majority of coconut grown today is used for household consumption (food, materials, livestock, and feed), with surplus sold locally or to processors who convert it into coconut oil (a low value commodity). Coconut oil’s exposure to falling global commodity prices has greatly decreased the effectiveness of coconut as a supplementary income stream (with return from sales only covering incidentals like fuel, school supplies, and incidental bills).

The majority of smallholders have inherited their trees from previous generations and their yield is very low and declining steadily. Harvesting is done on an ad hoc basis when there is a need for domestic supplies or for petty cash. While smallholders occasionally plant new coconut trees (particularly in Samoa), the returns from low value commodity coconut oil are generally perceived as being insufficient to warrant broad replanting or expansion.

A large amount of coconut, particularly in Fiji, is grown on land belonging to emigrants (on so-called ‘caretaker’ properties). It is expected that the majority of this coconut goes unharvested, with emigrants either disconnected from life in the Pacific or of the opinion that harvesting doesn’t provide a sufficient return on investment.

Much of the coconut on larger-scale commercial plantings, many of which are legacy colonial ‘estates’, also goes unharvested. Where the owners or managers of these estates do harvest, this part of their operations is subsidised by other off-farm revenue sources. In such cases they continue coconut production because of their emotional, cultural and traditional affection for coconut, and to provide additional employment to their staff and the local community.

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<sup>24</sup>Lowe, A. Norris, A.C., and Farris J. “Quantifying Thematic Saturation in Qualitative Data Analysis”, *Field Methods*, Vol. 30 Issue 3, August 2018. pp. 191-207

International aid and development agencies, many of whom have attempted for decades to leverage Pacific coconut to increase the livelihoods of local communities, identified significant barriers to meaningful progress. They pointed, in particular, to the fragmented nature of production, poor transport infrastructure, competition with highly sophisticated regions (SE Asia and India), and the Pacific's geographical distance from global supply chains. This combination of factors means the Pacific will never compete on price alone.

Coconut production in the Pacific faces stiff competition from so-called 'cash crops' (such as kava and cocoa) that are less labour intensive, vastly more profitable, and have a shorter time-to-harvest, as well as from other agricultural pursuits (fishing and livestock). Coconut planting and harvesting are perceived as being highly labour intensive, with emigration and seasonal worker programs in Australia and New Zealand competing for the Pacific's labour pool.

The distribution of seedlings by government and aid organisations has had mixed success, with most going unplanted unless an additional financial incentive is attached to bringing the trees to maturity (there is a distinct lack of private enterprise in replanting activity). Hybrid varieties introduced by donor agencies are perceived as inferior to local 'tall' varieties, especially in their resistance to cyclones and their meat yields.

There are almost no significant Pacific owned coconut Fast Moving Consumer Goods (FMCG) or businesses that operate in advanced western economies. The only significant Pacific Coconut export is raw oil, which is rarely attributed as Pacific in origin. Therefore the Pacific coconut industry, community and regional economies receive effectively no share of the growing \$US30B global coconut industry.

There is no doubt that coconut plays an emotional, social, traditional, and quasi-mythological role in Pacific communities. The 'tree of life' is not simply a commodity, but is rather intertwined within the fabric of daily life and ritual. Coconut is unlikely to disappear entirely from life in the Pacific Islands, though if it is to play a meaningful role in supporting the livelihoods of these communities a significant change in trajectory is required.

As production continues to fall from the majority of senile trees, coconut will continue to decline in both its subsistence value and its contribution to regional employment, exports and GDP. In the absence of the creation and expansion of higher-value opportunities, the continued decline of Pacific coconut may increase the reliance of Pacific economies on international donations, sponsorship and aid.

The greatest barriers to a rejuvenated Pacific coconut industry are not senility, pests, climate, planting materials, a lack of varieties, or agronomic knowledge. Such factors featured little and only tangentially in our open-ended conversations. Instead, the greatest barrier is the absence of economically meaningful opportunities for harvested coconut. Unless higher-value opportunities can be identified, grasped, and scaled, it is unlikely that we will see coconut play anything more than a domestic and ritualistic role across the Pacific.



## Narrative Themes



### Supply-Side Narrative Themes: Barriers to Replanting

Note: While some quotes have been amended to aid comprehension, all care has been taken to preserve the original meaning. All quotes in their exact original wording are contained within the appendices. Samoa did not provide English-language interview transcripts. Data from Samoa are extracts from their report.

"Mentioned in the interview that the price of copra drops a lot compared to past years and it discourages them to make more copra or plant coconut trees. He also stated that 'Copra labor extensive with less income earned nowadays'" - **Vanuatu**

"There are times when the copra price is good but most of the time copra price discourages farmers to do copra. They are not getting the expected money as compared to money earned in the past" - **Vanuatu**

Before [farmers] have planted coconut trees to produce copra but have stopped now as their is no available buyer of copra. Nowadays they use their coconuts as livestock feed, food security and local building materials" - **Vanuatu**

#### Coconut's Decline in Economic Life

"Before these farmers have grown coconut to do copra and sell it to earn income but they have now stopped producing copra due the price of copra [decreasing]. Now they use their coconut for food security, custom ceremonies and local building materials purposes" - **Vanuatu**

"I think it's just going to die out - people are just going to have it to eat - that's exactly the way it's going" - **Fiji**

"We grew up with Copra, our forefathers planted the trees. The price of Copra decreased - farmers lost interest - hardly see any copra crops [today]. Knowledge has been lost - give someone a copra knife and they wouldn't know how to use it. Use it for meals but not for earning money" - **Fiji**

"Many young men choose and opt to seek employment overseas for family income, rather than staying and growing crops, leaving only women, children and elderlies to do home duties but absolutely no farming" - **Samoa**

"Competition for labour and high labour costs [are constraints to industry growth]" - **Fiji**

#### Labor Intensity of Production & Labor Shortage

"Copra work is labor intensive, [growers] are requesting that the government support them through [value adding], and need other ways to earn money rather than doing copra" - **Vanuatu**

"Copra labor expensive with less income earned nowadays" - **Vanuatu**

"Clearing, preparation and holes are [expensive] First 2 years is a pain in the neck - getting the coconuts to a competitive height... It's taken us a bit by surprise how much maintenance there is before you can get into production" - **Fiji**

"The increasing number of adults and youth migrating overseas as seasonal workers, through the Government Regional Seasonal Employment Scheme (RSE) has significantly impacted a lot of local agricultural activities, including coconut replanting" - **Samoa**

"During my grandparent's time they were reliant on coconut. They were collecting coconut from farms, making oil and extracting copra as a source of income for the family. Now we have shifted from coconut to other farming practices... [There is] very little income nowadays from coconut" - **Fiji**

"I have left coconut farming and venture to yaqona farming because of its market value... There is little interest in growing coconuts in large scale because its market price is very low" - **Fiji**

#### Competition with other Agricultural Pursuits

"The price keeps fluctuating - [farmers] are planting Taro and Kava. Kava is \$100 per kg. Why plant coconut when it's \$1/kg when Kava is \$100/kg? Whatever gets the highest price, that's what they will plant" - **Fiji**

"[Farmer asked]: Is there any possibility to supply cocoa to farmers instead of coconut. Interested in planting cocoa since cocoa price is increasing rapidly and [is stable]" - **Vanuatu**

"Due to drop in price for copra, we have stopped [using coconut for commercial gain]. Now we rely on fishing and we sell it within the island or to neighbouring island such as Taveuni" - **Fiji**

"Most of the time copra price in markets is unstable market. Thus it is not the only source of income, cocoa is also being introduced and has impacted positively due to less labor intensity" - **Vanuatu**

"The criticism I have of nurseries etc. - the assumption is everyone will want more coconuts... - turns out this isn't solving a real need" - **Aid & Development Organisation**

"If seedlings are free without incentives provided for looking after the trees, only 2/10 would replant" - **Fiji**

#### Mixed Success of Replanting Initiatives

"Yes [we will replant coconut], the village is expecting 100 seedlings from, Wainigata Research Station for their replanting programme" - **Fiji**

"In 2019, the grower replanted coconut trees distributed by EDF11 (DARD)" - **Vanuatu**

"There's been no effective replanting programs on the ground. Effects of cyclones every 5 years - production has continuously declined. 1977 used to be 30,000 tonnes, now it's down to 5,000" - **Fijian Processor**

"The farmers will only plant if there's something attractive to them. [The] Department of Ag is giving away free seedlings - but if there's nothing attached to the care farmers are not interested - we distributed seedlings for free and went back six months later and they were sitting there still unplanted" - **Fiji**



## Supply-Side Narrative Themes: Other Key Findings

Note: While some quotes have been amended to aid comprehension, all care has been taken to preserve the original meaning. All quotes in their exact original wording are contained within the appendices. Samoa did not provide English-language interview transcripts. Data from Samoa are extracts from their report.

"The people that tried the dwarf weren't happy - the meat was about the same but it was a huge coconut - a bit of a failure. Don't cope very well in the cyclones - Fiji tall is pretty hard to beat when you get the good ones" - **Fiji**

"The villagers agreed that Fiji Tall variety is the most preferred variety grown because of qualities such as thick flesh (more products and more oil content) and very easy to husk" - **Fiji**

"In the past, copra was the main source of income for every household in the Island. It has helped me educate my children and meet every other household expenses" - **Fiji**

"His family planted a total of three hectares of coconut trees (two plantations) and was passed on from generation to generation from parents to children" - **Vanuatu**

"Dwarf and hybrids are very susceptible to cyclones, the Fiji Talls are able to withstand them" - **Fiji**

### Perception of Dwarf/Hybrid Varieties

"[When replanting I have] chosen to replant the tall variety rather than the hybrid - the hybrid flipped over too easily in the hurricanes" - **Fiji**

"In a coconut tree, whatever we need is provided....to the Fijian people" - **Fiji**

### Coconut's Historical, Cultural, & Domestic Significance

"Coconuts were planted at that time since it is our only source of income before and after independence" - **Vanuatu**

"The most common reason behind their preferences in growing the Samoan tall variety [over hybrids] is that it produces more coconut meat than any other variety" - **Samoa**

"During the discussion, the villagers were adamant that the Fiji Tall variety is the most suitable and are very much reluctant to grow hybrid variety" - **Fiji**

"Fijian's normally use [coconut] for cooking, juice, jam, handicraft etc. The entire tree is useful in making household products, without coconut life will be incomplete as we use coconut every day" - **Fiji**

"Most of the enumerated households (85%) produced coconuts mainly for home consumption or for making food for the family...only fifteen percent of them produced coconuts mainly for sales to get income" - **Samoa**

"Traditional copra is no longer productive - if it's going to work there needs to be decentralised systems that take advantage of all the parts of the coconuts. That whole part has not been thought through" - **Fiji**

"We need a whole nut approach - coconut water, syrup, sugar - need to do that and have a link to the market - Philippines and Vietnam are good examples - carbonised the shells and then sent. Sri Lanka also has a very professional product development facility - in Fiji you are on your own" - **Fiji**

"[The grower has] No plans to replant coconut trees, but for instance the farmer is interested in planting cocoa, which requires less labor, and more income" - **Vanuatu**

"The farmer is discouraged with the copra price, he plans to do [one] last replanting and [then] put less concentration on coconut while focusing more on cocoa" - **Vanuatu**

"There's a flaw in the way we do development [in that] it starts with the government - where is the private sector in this? - **Aid & Development Org**

### The Need for Product Innovation & Private Enterprise

"Need key private sector players to be part of the implementation" - **Aid & Development Org**

"Besides Kiribati, coconuts getting more and more senile - no replanting since the 1960s. Over 30 year period, 300 acres becomes 120 acres" - **Fiji**

### The Future of Coconut in the Pacific

"I think it's just going to die out - people are just going to have it to eat - that's exactly the way it's going" - **Fiji**

"The real challenge is going to be finding the business who is going to do it: the exporter, the processor" - **Aid & Development Org**

"If there was something that was viable we'd be the first to go for it - [at the moment there's only] cut copra, there's no value adding" - **Fiji**

"There is still hope for the future of the coconut industry in Samoa, as almost eighty percent of enumerated households responded that they have done some replanting of new palms in the last two years" - **Samoa**

"I hope that my children and the younger generation make good decisions regarding the family coconut plantation and hope there will be a good market price for copra in order to increase the level of interest among the younger generation" - **Fiji**



## ***Demand Side Findings***

### ***Summary of End-Consumer Opportunity Analysis Undertaken by UQ MBA Students***

In the Entrepreneurship Capstone of the MBA at the University of Queensland (UQ), postgraduate students have a semester to conceptualise, test, and partially validate an innovative business model. In Semester 2 of 2021, a team of three students were tasked with developing an innovative direct-to-consumer coconut product. It was hypothesised that if an attractive market for such a product could be found, it would enable a nascent Pacific owned and operated business to extract very high margins from product sales, and to therefore pay farmers well above global commodity prices for their coconut.

While there are undoubtedly a myriad of challenges on the 'supply' side of this equation (many of which are considered in this report), the MBA students were asked to hold supply as fixed, and to focus instead on uncovering potential pockets of demand.

The three postgraduate students: Bayerinaa Nmanii, Jessica Barjaktarovic, and Prakash Subramaniam were asked to:

- a. Identify potential markets for coconut products and conduct market sizing and analysis to determine their relative attractiveness.
- b. Interview end-customers (consumers) to identify the unsolved pains and unrealised gains that could be addressed by a coconut product.
- c. Develop compelling Minimum Viable Products (MVPs) that communicated the value of potential coconut products to consumers and elicited feedback.
- d. Consider the areas of product/technical innovation that could capture greater value from coconut products.
- e. Develop viable, desirable, and feasible business models that would capture significant value from PIC coconuts and return a proportion of this value to growers and their communities.
- f. Conduct financial analysis and modelling in order to project the associated investment/return on investment for new coconut products.

The team presented their findings to a variety of stakeholders in November of 2021 (a mix of ACIAR & DFAT staff, along with coconut researchers from UQ and the Queensland University of Technology).

A summary of their findings is reproduced below, while their final presentation is appendicised in appendix 1:

1. The global coconut market is experiencing strong growth, growing from US\$11.5B in 2018 to an estimated US\$31.1B in 2026 with a CAGR of 13.6% (the largest segments of which are coconut water, coconut oil, and coconut milk).
2. The macro trends of health and wellness, provenance, ethical consumption, and single-ingredient foods provide significant tailwinds for Pacific coconut products.
3. Comprehensive market analysis reveals a significant opportunity for the production of a high-value, whole coconut product or superfood blend. Such a product would provide immense benefit to health-conscious customers:
  - Dairy, lactose, and gluten free
  - Plant-based
  - High in manganese and fibre
  - Rich in copper, iron, amino acids and healthy fats (MCTs)
  - Natural source of electrolytes and potassium
  - Low carbs
  - Sweet nutty taste
4. A Pacific coconut product would provide significant functional, emotional, and social/self-transcendent benefits to customers, all of which were validated through extensive customer interviewing:
  - **Top functional benefits:** affordable, healthy & nutritious sustenance that saves time.
  - **Top emotional benefits:** improving wellness while enjoying the taste.
  - **Top social/self-transcendent benefits:** supporting livelihoods in the Pacific, being a responsible global citizen, making ethically responsible purchasing decisions.
5. Market analysis, trend analysis, and extensive customer interviewing enabled the team to formulate a partially validated product value proposition: *Made from 100% pacific island coconuts, our healthy product helps remote pacific island communities by guaranteeing higher returns to local farmers and their communities.*
6. Minimum Viable Product (MVP) testing (in this instance, a mock product landing page), provided further validation that customers would be willing to pay a premium for a natural, ethical product that supports Pacific communities.
7. Financial analysis suggests that a viable business model can be built around a Pacific coconut product that *returns 20% of profits* to growers and their communities through a profit-sharing arrangement.

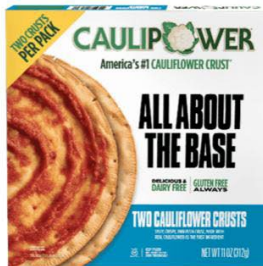
While there is still work to be done to validate the desirability, the viability, and the feasibility of Pacific coconut product innovation, the work done by the MBA team provides

strong early indications that a robust business model can be constructed that returns meaningful value to the Pacific.

Product innovation provides businesses with the opportunity to convert low-value commodities into high-value consumer products. Doing so for Pacific coconuts is the key to capturing higher economic value and returning this to smallholders



## Product Innovation Showcase



### Cauliflower to Pizza Bases with *Caulipower*

Caulipower is perhaps one of the most successful food start-ups of recent times.

Created by a female US PR executive with no food background, Caulipower started out by making low carb, gluten free pizza bases out of cauliflower. After Launching in 2017, Caulipower is now worth US\$500M.

This is the power of the combination of solving the right problem with product and business model innovation and dedicated start-up execution.

This showcase demonstrates how low-value commodities can be transformed through product innovation into high-value consumer products. Doing so for Pacific coconuts is the key to capturing higher economic value and returning this to smallholders.

### Vanilla into Extract & Paste with *Heilala*



Heilala began as an aid project in Tonga in 2002 post Cyclone Waka and is now the world's most awarded vanilla, endorsed by top chef's worldwide.

Vanilla is grown locally in Tonga and transformed into extracts, pastes, and more using a cold-pressed, slow-extract process.

400mls of the Heilala Vanilla Paste retails for \$109.95 AUD. Heilala provides local employment, best-practice agronomic knowledge, and supports local school students through its foundation.



### Soybeans to Burgers with *V2food*

In Australia V2food has raised over \$100M and is worth \$500M after 3 years by using CSIRO food technology to develop plant based burgers from soybeans.

V2food was able to go from zero to half a million burgers sold in less than 18 months.

It demonstrates the power of product innovation, especially when married with global food mega trends (plant-based food, sustainability, minimising environmental impact).

### Coconut into Superfood with *Nuiji*



The UQ MBA Team identified, tested with customers, and partially validated a high-value Pacific coconut superfood blend Nuiji.

This superfood could be added to smoothies, yoghurts, and baked goods and would be well positioned to ride the global mega trends of health, sustainability, provenance, and ethical supply chains.

A full business case for Nuiji is provided in the appendices.

### ***Implications of Findings & Solution Design Principles***

The rejuvenation of the coconut industry in the Pacific faces significant obstacles. Pacific coconut's exposure to volatile and falling global commodity prices is reducing the role it plays in economic life. Coconut faces stiff competition from other cash crops, and the labour pool historically involved in the intensive parts of production is dwindling as a result of emigration and seasonal worker programs.

The replanting programs that have achieved moderate success have relied on attaching a financial incentive to bring the trees to maturity. There are significant questions surrounding the economic viability of such an approach, and there's no suggestion this could be scaled across the Pacific.

Unless higher-value opportunities can be identified, grasped, and scaled, it is unlikely that we will see coconut play anything more than a domestic and ritualistic role across the Pacific. Product innovation holds the key to unlocking these high-value opportunities, and the MBA Entrepreneurship team have been able to partially validate an example of such an innovation.

The learnings from both the supply-side (qualitative interviews with smallholders) and demand- side (product opportunity identification) project activities have been carried forward in the 'solution design principles'. Design principles are a set of values that act as guardrails for the development of a new product, service, business model, or initiative. They ensure that the most significant project findings are embedded within the solution, giving any further work the best chance of success.

The three key design principles that underpin the proposed solution are:

1. **Profit, people, planet:** Any proposed initiative should operate with a triple bottom line, and commit itself to meaningful progress in three overlapping arenas:
  - a. **Profit:** The initiative must make sense as an economic endeavour first. This ensures it is self-sustaining, scalable across geographies, and continues to provide value and create impact long after any startup funding is exhausted.
  - b. **People:** The initiative must be driven by, and return value to, the local communities in which it operates. Successful initiatives will be majority owned and championed by locals, which is critical to ensuring consistent supply of coconut, and to identifying and responding to community concerns.
  - c. **Planet:** The initiative must respond to contemporary consumer expectations around sustainability and environmental impact, ensuring that growth doesn't come at the cost of local habitats.

2. **Product Innovation:** In order to make the growing of coconut an attractive proposition for farmers in Fiji, Vanuatu and Samoa, it is essential that any initiative meaningfully increases the financial value they receive for their efforts. Product innovation will enable initiatives to extract a greater margin from the sale of coconut products, and therefore to return more value to farmers and their communities.
3. **Business Model Innovation:** R&D activity in particular can overemphasise the technical development/maturation of ideas without considering how a proposed technology will deploy commercially. The greatest barriers to a rejuvenated Pacific coconut industry are not senility, pests, climate, planting materials, a lack of varieties, or agronomic knowledge etc., but a lack of high-value opportunities for Pacific coconut. This is an economic problem that can only have a business model solution.

In addition to these three design principles, it's proposed that any solution also be positioned to leverage prevailing tailwinds. The following have been identified as of particular relevance:

1. The deep intertwinement of coconut with historical, traditional, cultural, and emotional life in the Pacific. There is a strong interest and bias towards supporting enhanced coconut production if it can be coupled with tangible economic and social benefits for growers, businesses, and communities.
2. The enormous brand-equity of the Pacific, and the goodwill of the international community. The leveraging of this brand equity is best evidenced by the continuing global popularity of Fiji Kava and Heilala Vanilla (sourced from Tonga and operated by a NZ company). The Pacific as a region and people are recognised and held affectionately by many in advanced economies. Many middle and upper income consumers have either been to or aspire to go to the Pacific.
3. Coconut is part way through a meteoric rise in consumer and commercial popularity, as evidenced by its anticipated growth to a US\$30B+ market by 2026<sup>25</sup>. While desiccated coconut has been a baking stalwart for decades, the development of coconut water and yoghurt have been recent successes.

The intrinsic characteristics and nutritional benefits of coconut are a perfect fit for the accelerating wants and needs of consumers. Coconut has features which directly relate to the majority of the biggest food trends globally now (as identified by New Nutrition Business's "10 Key Trends in Food, Nutrition & Health 2022")<sup>26</sup>.

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<sup>25</sup> Allied Market Research, "Coconut Products Market by Type: Global Opportunity Analysis & Industry Forecast". 2019. Retrieved: <https://www.alliedmarketresearch.com/coconut-products-market>

<sup>26</sup> New Nutrition Business, "10 Key Trends in Food, Nutrition & Health 2022". 2021. Retrieved: "https://www.businesswire.com/news/home/20211104005886/en/10-Key-Trends-in-Food-Nutrition-Health-for-2022"

- a. Naturally Functional
  - b. Weight Wellness
  - c. Snackification
  - d. Carbs – better & fewer
  - e. Digestive Wellness
  - f. Fat fuels growth
  - g. Plants made convenient
  - h. Emerging nutrient density
  - i. Provenance & authenticity
4. The increasing popularity of ‘for-good’ and ‘for-purpose’ commercial organisations that capture value to deliver real-world impact. In Australia, we have seen brands such as *Who Gives a Crap*, *Thankyou*, and *Zambrero* enjoy enormous commercial success while also providing social good. The trend of ‘business for good’ is expected to accelerate as the downsides of growth-at-all-costs capitalism are further exposed





## Solution Design Principles

Design principles are a set of values that act as guardrails for the development of a new product, service, business model, or initiative. They ensure that the most significant project learnings are embedded within the solution, giving the initiative the best chance of success.



The project's key findings informed the development of three design principles.



Any solution should also leverage prevailing tailwinds.

**1. Profit, people, planet:** Any proposed initiative should operate with a triple bottom line, and commit itself to meaningful progress in three overlapping arenas:

**Profit:** The initiative must make sense as an economic endeavour first. This ensures it is self-sustaining, scalable across geographies, and continues to provide value and create impact long after any startup funding is exhausted.

**People:** The initiative must be driven by, and return value to, the local communities in which it operates. Successful initiatives will be majority owned and championed by locals, which is critical to ensuring consistent supply of coconut, and to identifying and responding to community concerns.

**Planet:** The initiative must respond to contemporary consumer expectations around sustainability and environmental impact, ensuring that growth doesn't come at the cost of local habitats.

**2. Product innovation:** In order to make the growing of coconut an attractive proposition for farmers in Fiji, Vanuatu and Samoa, it is essential that any initiative meaningfully increases the financial value they receive for their efforts. Product innovation will enable initiatives to extract a greater margin from the sale of coconut products, and therefore to return more value to farmers and their communities.

**3. Business Model Innovation:** R&D activity in particular can overemphasise the technical development/maturation of ideas without considering how a proposed technology will deploy commercially.

The greatest barriers to a rejuvenated industry are not senility, pests, climate, agronomic knowledge, etc., but a lack of high-value opportunities for Pacific coconut. This is an economic problem that can only have a business model solution.

The deep intertwinement of coconut with historical, traditional, cultural, and emotional life in the Pacific.

The enormous brand-equity of the Pacific, and the goodwill of the international community.

Coconut's meteoric rise in consumer/commercial popularity, and its association with related mega trends in health, wellness, provenance, and more.

The increasing popularity of 'for-good' and 'for-purpose' commercial organisations that capture value to deliver real-world impact.



## A Possible Solution: The Pacific Coconut Miracle innovation initiative (PCMii)

### *Rationale:*

While it is beyond the scope of this project to design and implement an initiative that would arrest the decline of coconut production in the Pacific, the research team have sketched and here presented one *potential* solution. It is hoped that doing so will achieve the following:

1. It will demonstrate the shift in emphasis required to achieve meaningful change: from purely technical research (propagation, pests & disease, breeding), to technical research married with economic development activity (the creation of new products, markets, companies, and business models).
2. It will illustrate the type/flavour of initiative that is believed to naturally arise from the identified barriers to replanting and the solution design principles (as presented earlier in this section).
3. As an example of a sweeping initiative, it will act as a conversation starter between Australian R&D organisations, international NGOs, and the relevant Pacific Island parties.

The potential solution has been presented in a pitch-like tone in order to best highlight its advantages. Markedly increasing the production of coconut in the Pacific will require broad cooperation, buy-in, and effort from a wide variety of stakeholders; it is therefore essential that any initiative is presented and communicated in a compelling fashion, with a different 'look and feel' from previous efforts.

### *PCMii Overview:*

The Pacific Coconut Miracle innovation initiative (PCMii) will transform the Pacific: creating jobs, exports, and tourism, while stimulating production and processing investment through liberating the untapped value of the Pacific's most abundant food resource. It will do this through curating, establishing, incubating, accelerating, and scaling a network of locally owned, interdependent, born global, high-value coconut startups.

Ironically the Pacific has almost no globally recognised coconut brands; PCMii will change this, exploiting the enormous consumer brand equity of the Pacific and coconut's intrinsic health halo to secure an unfair share of a US\$30B+ global market.

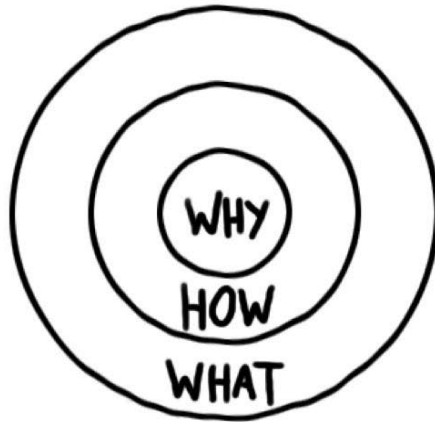
Einstein is reported to have said "We cannot solve our problems with the same thinking we used when we created them". The Australian Government has spent >\$18M over the last 20 years on coconut research and still the industry is in decline. R&D that focuses on propagation, breeding, or pests ignores the lack of economically meaningful options for harvested coconut across the Pacific. WE need to do more, but differently.

For PCMii to be successful, we need to create new companies taking innovative products, services and business models to a global market. Given 90+% of start-ups fail, over the next 10 years PCMii will need to work with over 100 new start-ups in the hope of creating 5-10 that are truly global, delivering transformational impact to the Pacific.

Imagine if we could create even one \$20M start-up, based on value added coconut from the Pacific? What if we could create a GYG or Boost Juice for Coconut foods and drinks, or a CoconutPower or C2 foods fuelled by Pacific Coconuts and Pacific labour?

This would create unparalleled economic activity and prosperity with multiple trickle down effects for the entire Pacific community. Creating Jobs, wealth, increased tourism, the ability to proactively manage climate change effects, and true independence from the influence of foreign governments.

# The Pacific Coconut Miracle Innovation Initiative (PCMii)



Simon Sinek's Golden Circle

Why (purpose/reason for existence)	What (PCMii's activities)
<p>Socio-Economic &amp; Geopolitical Independence for the Pacific</p> <p><i>The Tree of Life</i> can again transform the Pacific, creating jobs, exports, tourism, and investment through liberating the untapped value of the most abundant Pacific food resource, and returning a share of this value to local communities.</p>	<p>Curate &amp; Execute on a Pipeline of High-Value Innovation Opportunities</p> <ol style="list-style-type: none"> <li>1. Develop a centre for new product, new service and new business model innovation in Australia and in one or more Pacific nations.</li> <li>2. Establish Coconut PCMii start-up hubs in each of the participating Pacific countries.</li> <li>3. Train and support local Pacific partners in delivering world's best practice start-up and innovation curation, incubation, acceleration and expansion support systems.</li> <li>4. Develop a network of global food industry investors and value chains including retail and food service chains interested in taking to market and scaling new PCMii start-ups.</li> <li>5. Create linkages with global sources of financial capital to invest in businesses that demonstrate global potential.</li> </ol>
How (how we will achieve the why)	
<p>Develop Local Innovation Capability</p> <p>The Pacific Coconut Miracle Innovation Initiative (PCMii) will co-design, launch, and scale locally-owned, born-global coconut startups. These startups will deliver high-value, premium, and innovative coconut products to international markets, returning value to local growers and their communities through a profit-sharing mechanism.</p>	

Indicative high-level sequence

1. Secure PCMii setup funding from international aid, development, and philanthropy organisations.

2. Establish PCMii base of operations and form relationships with local communities to build startup teams.

3. Guide startup teams through all stages of best-practice innovation/new product development.

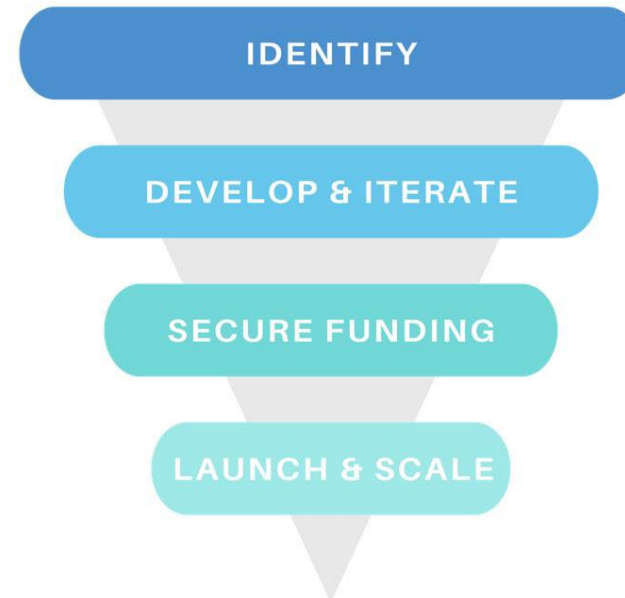
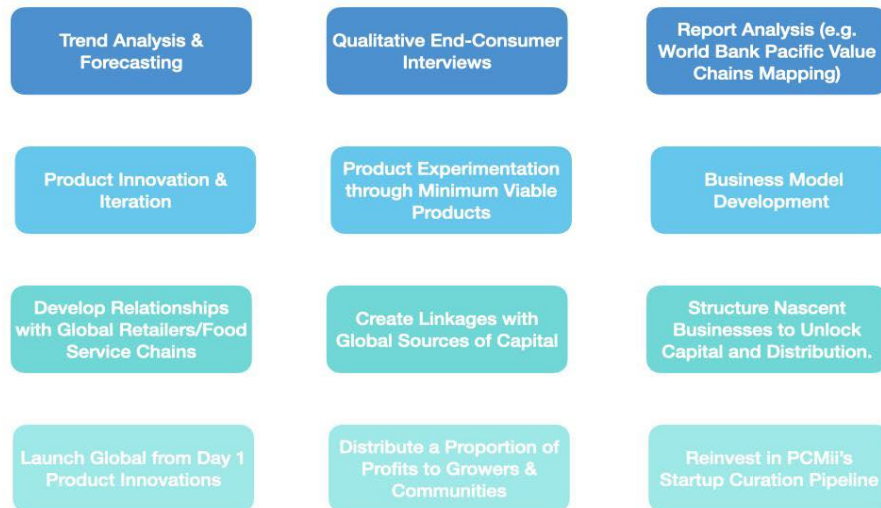
4. Secure seed investment for nascent startups and launch global, high-value products.

5. Distribute a proportion of profits to growers and their communities, and reinvest in PCMii's operations.

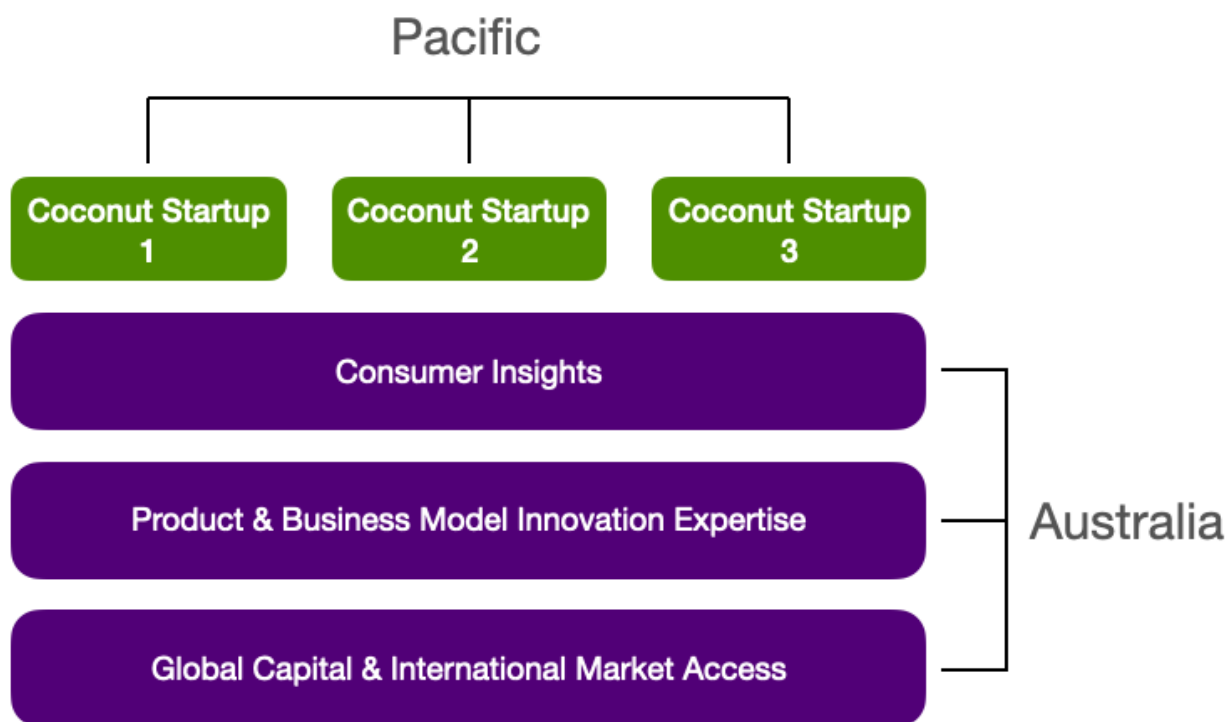


## PCMii's *Ideas to Innovation* funnel

### Indicative activities



## *A new paradigm for aid and development empowerment*



PCMii represents a new paradigm for aid and development empowerment that marries Australian consumer insights, product & business model innovation expertise, and global capital & market access with Pacific owned and operated startups. If successful, this model could reach across the globe, allowing startups in donor countries to escape the commodity vortex. At its core PCMii is a model of co-creation and co-ownership, for neither party can create value and impact without the other.

### *Funding PCMii*

#### *Proof of Concept Stage for PCMii operations*

The ultimate goal is to develop a self-sustaining and commercially viable business model for PCMii, with a proportion of profits from startups reinvested in the startup curation pipeline. Initially, funding for a Proof of Concept will be required to establish a base of operations and to bring the first few startups to life. This proof of concept phase will require Australian government support as well as meaningful buy-in from Pacific Island Countries.

#### *Startup funding through private mechanisms*

Once investible startups have been created, more traditional sources of private investment can be raised to bring them to scale. There are both well-established and emerging mechanisms for nascent businesses to obtain investment. These provide an opportunity for PCMii startups to draw their capital from non-government/non-aid streams. The expected benefits of diversifying the sources of capital are numerous; it will:

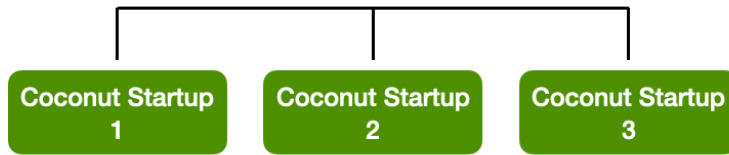
1. **Grow the available capital:** Diversifying the sources of capital increases the amount of funding available to the startups.
2. **Embed commerciality:** While aid and development funding plays a vital role in emerging economies, in commercial initiatives it dampens market feedback, making nascent businesses less sensitive to the realities of their operating environment. Obtaining financing untethered to humanitarian aims ensures the startups are built on a commercially responsible foundation, which in turn ensures PCMii as a whole is sustainable and scalable.
3. **Build community:** Crowdfunding and equity crowdfunding (discussed below) work only when a large community of people are inspired and motivated to support a cause. While it's a significant amount of work to bring these people together, a highly engaged community provides value at every stage of an initiative's development.
4. **Validate the PCMii business model:** Any source of outside investment will provide initial validation that the value proposition of the startup is attractive, and that the financial case underpinning it makes commercial sense. Discussions with investors, even when they don't lead to investment, are an excellent way to identify any weaknesses in assumptions or logic.

The most promising mechanisms for PCMii startups to obtain early-stage investment are as follows:

1. **Venture Capital (especially angel investment):** Venture capital investment provides early-stage funding to nascent companies in exchange for a share of future value (secured in the form of equity). Angel investment typically occurs at the earliest stage of a company's lifecycle, and will be most relevant for PCMii startups.
2. **Crowdfunding:** Crowdfunding is a mature mechanism of capital raising where supporters contribute towards a fundraising goal, usually in exchange for rewards that are tiered by donation amount. In Australia, [Pozible](#) regularly raises funds for community and social good initiatives both locally and in neighbouring countries.
3. **Equity Crowdfunding:** Equity crowdfunding is an emerging mechanism of capital raising where individuals are issued shares in private companies in return for investment. It allows companies to raise money from supporters, and return meaningful value to these supporters, without having to list publicly. In Australia, equity crowdfunding platform [Birchal](#) has experienced rapid year-on-year growth as interest in this investment category continues to rise.

Access to capital will initially be facilitated through PCMii's Australian base of operations.

Startup funding obtained through  
traditional private mechanisms (e.g.  
venture capital)



Australian Government funds  
Proof of Concept Stage.  
Ongoing investment provided  
by a share of startup revenue.

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## 7 Impacts

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### 7.1 Scientific impacts

The outcomes from this project highlight the need for a significant paradigm shift in the way Australia does international agricultural research. For 40 years ACIAR has leveraged scientific capability to deliver social, cultural and economic benefits to Australia and developing countries. The chief achievements in coconut research have been the development of scientific solutions to real agricultural constraints like pest and disease, harvesting, productivity, varieties and propagation.

Despite these achievements (the result of significant investment) the PIC coconut industry continues to decline rapidly. While scientific investment has solved real productivity problems, it has not addressed the fundamental constraint precipitating the industry's decline. Much more effort (scientific, economic, and behavioural) needs to be spent on deeply understanding and addressing this constraint; namely, that crude coconut oil is not economically viable.

While agronomic research remains important for a vibrant coconut industry, without unlocking higher value returns to growers this will not arrest industry decline. Further investment should prioritise the identification of innovative value-adding and business model opportunities that have the potential to deliver such returns. Continued investment into coconut propagation without this missing link may in fact accelerate the industries decline by further lowering crude oil prices.

The findings of this report have broader implications for ACIAR's investment process. It seems clear that significant time and investment in PIC coconut has heretofore failed to unearth the key reason for industry decline. Without this information, it is hard to envisage how selection and prioritisation of projects aimed at industry renewal can occur. It seems clear that if research in the PIC coconut industry is to have impact, it needs to contend with fundamental economic and behavioural realities.

Future research must address both 'can we' and 'should we' questions in parallel through a human-centred ethnographic approach. Research partners will need encouragement to adopt such an approach, for it requires that projects widen in scope from purely technical/scientific to embracing of the complexities of human behaviour. Such a shift can be achieved by embracing or developing a capacity-building program similar to the one used by the US National Science Foundation's i-Corp program.

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### 7.2 Capacity impacts

This project successfully trained 15 research partners across three Pacific countries in basic human-centred ethnographic research methods. This was achieved despite COVID and the Samoan constitutional crisis, with training delivered entirely remotely. The interactions with the 15 research partners were as follows:



<b>Interaction.</b>	<b>Activity</b>	<b>Description</b>	<b>Completion Date</b>
1	Kick-off Meeting	The research project leaders from each collaborating organisation were brought together to outline project purpose and methodology.	31 March 2021
2	Full-team Ethnographic Training Session 1	All team members from each collaborating organisation were brought together for a 4-hour interactive workshop where they were upskilled on best practice ethnographic research techniques.	30 April 2021
3	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	7 May 2021
4	Full-team Ethnographic Training Session 2	All team members from each collaborating organisation were brought together for a 4-hour interactive workshop where they were upskilled on best practice ethnographic research techniques.	14 May 2021
5	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	21 May 2021
6	Research Partner Check-In	Following delays occasioned by COVID restrictions and the Samoan constitutional crisis, the team reconvened to set adjusted project completion dates.	4 August 2021
7	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	11 August 2021
8	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	18 August 2021
9	Optional Drop-In Training Session	All team members were provided with the opportunity to update UQ on their primary research, and ask any clarifying questions.	25 August 2021
10	Final Submission of Primary Ethnographic Research	Research Partners submitted their final data for analysis.	26 November 2021
11	Report Feedback & Amendments	All partner organisations were provided with the draft final report and were given the opportunity to suggest amendments.	23 March 2022

It is likely the research partners will be able to use these nascent skills in their own activities, which should increase the likelihood that any of their projects, policies and activities will solve the right problems and achieve greater impact.

The 'can we' and 'should we' approach and the associated training, tools and processes should be incorporated into other ACIAR projects across other regions. If this capacity building initiative was implemented successfully more broadly, it is possible that ACIAR and its partners may see a significantly enhanced real-world impact from its investment activities.

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### 7.3 Community impacts

Community impacts from this small R&D activity are limited. Significant economic, social, and environmental impact will emerge from R&D activities that concern themselves with the identification, curation, and – ideally - creation of economically competitive opportunities for harvested coconut in PIC nations.

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### 7.4 Communication and dissemination activities

The communication and dissemination activities (completed and expected) are as follows:

Completed:

1. The UQ MBA team presented their demand-side findings to a panel consisted of:
  - a. ACIAR staff.
  - b. Coconut researchers from QUT & UQ.
  - c. DFAT.
2. The draft report was made available to all research partner organisations for commentary and input.
3. A [video](#) was constructed and disseminated, outlining in a captivating manner the key findings of the project and the proposed potential solution (PCMii).

Expected:

It is expected that the report authors will present their key findings to coconut researchers at a pre-scheduled meeting in Brisbane in 2022. Findings may also be presented at Pacific week 2022.

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## 8 Conclusions and recommendations

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### 8.1 Conclusions

Though coconut is part-way through a meteoric rise in consumer and commercial popularity, the Pacific is at present ill-positioned to benefit from this growth. A myriad of factors have combined to paint a bleak and consistent picture of the current trajectory of Pacific coconut production:

1. The Pacific's overexposure to volatile and falling global coco-oil commodity prices means that coconut no longer plays a meaningful role in economic life, greatly deactivating investment in both baseline replanting and production expansion.
2. Production faces stiff competition from so-called 'cash crops' (such as kava and cocoa) that are less labour intensive, vastly more profitable, and have a shorter time-to-harvest.
3. The fragmented nature of production, poor transport infrastructure, and geographical distance from global supply chains means the Pacific will never compete on price with highly sophisticated regions such as SE Asia and India.

The greatest barriers to a rejuvenated Pacific coconut industry, therefore, are not senility, pests, climate, planting materials, a lack of varieties, or agronomic knowledge. Instead, the greatest barrier is the absence of economically meaningful opportunities for harvested coconut. Pacific coconut production requires a rapid and dramatic reconfiguration if it is to play an ongoing role in the livelihoods of Pacific communities. It is abundantly clear that for aid and development funding to drive impact it should be targeted at such a reconfiguration.

Only coconut product and business model innovation will allow the Pacific to escape the vortex of commoditisation. If successful it will enable growers to convert a low-value commodity into high-value consumer products, and it is the key to capturing higher economic value and returning this to Pacific communities. Innovation will create jobs, increase exports, stimulate production, and assert the Pacific's economic and political independence from foreign governments.

To have meaningful impact, this innovation needs to be replicable and to operate at scale. The Pacific Coconut Miracle innovation initiative (PCMii) was designed as an illustrative enterprise that could drive Pacific-wide impact. PCMii would curate, establish, incubate, accelerate, and scale a network of interdependent, locally owned, born global, high-value coconut startups.

PCMii represents a new paradigm for aid and development empowerment that marries western consumer insights, product & business model innovation expertise, and global capital & market access with donor country owned and operated startups. If successful, this model could reach across the globe, allowing startups in donor countries to achieve an escape trajectory from commoditisation. At its core PCMii is a model of co-creation and co-ownership, for neither party can create value and impact without the other.

With PCMii, or an initiative like it, the *Tree of Life* can once again transform the Pacific.

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## 8.2 Recommendations for Further Research

The findings of this research project have broad implications for both ACIAR and the wider international coconut research community. They allow for the identification of those areas of research that are likely to lead directly to the rejuvenation of the Pacific coconut industry, and – conversely – those that may be necessary but insufficient for industry renewal.

The greatest barriers to a rejuvenated Pacific coconut industry are not senility, pests, climate, planting materials, a lack of varieties, or agronomic knowledge. Instead, the greatest barrier is the absence of economically meaningful opportunities for harvested coconut.

Any R&D project that aims to arrest declining coconut production in the Pacific, and therefore improve the livelihoods of communities, must concern itself with the identification, curation, and – ideally - creation of economically competitive opportunities for harvested coconut. Of course, this is not to suggest that there is no value in purely agricultural research (breeding, pest, & disease), but rather that this must be accompanied by activities that identify and create new markets.

Further research and development questions ripe for exploration include:

For individuals:

1. What are the barriers to individuals engaging in entrepreneurial activity in the Pacific, and what can we learn from international success stories like Fiji Kava and Heilala Vanilla?

For nations:

2. At what point are Pacific Island nations in the evolution of their national innovation systems, and where are the key gaps and opportunities?

For the region:

3. What are the key international market access barriers facing Pacific Island nations?

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## 9.2 List of publications produced by the project

N/A

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### **9.3 Appendix 1 (Demand-Side Findings of UQ MBA Team)**

