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Food Havens: Governing Technological Change for Equitable, Sustainable and Healthy Pacific Food Futures

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ABSTRACT

Background: Global food systems are being reshaped by climate change, nutritional transition and widening health inequities. In Pacific communities, these pressures intersect with colonial legacies and import-dependent food economies, contributing to a high burden of diet-related non-communicable diseases. Since 2018, the Food Havens programme has undertaken community-based research across Pacific settings, emphasising that food-related health challenges require systems-wide approaches rather than health service-centred interventions.

Objective: To examine how rapid technological change may reshape Pacific food systems and health equity, and to identify policy-relevant directions for socially just food futures.

Methods: This paper undertakes a qualitative, conceptual policy analysis. Drawing on Food Havens programme insights, it applies the Honest Food Framework to assess current Pacific food systems and to contrast inclusive and extractive future trajectories. Scenario-based analysis examines the implications of digital, production and governance technologies across agriculture, food markets and nutrition support.

Results: Technological change creates both opportunities and risks. Community-governed pathways may strengthen food sovereignty, nutrition and resilience, while poorly governed technologies risk deepening dependency and health inequities.

Conclusions: Technology alone will not produce equitable food or health outcomes. Policy-makers should prioritise governance frameworks that embed cultural values, community decision-making and accountability in food-system innovation. These findings are relevant for countries seeking to align digital transformation with health equity and resilience.

Research in Context

1. What is already known about the topic?

Pacific communities experience a high burden of diet-related non-communicable diseases shaped by food import dependence, climate vulnerability and historical inequities. Food systems are increasingly recognised as central determinants of health, yet policy responses have often focused on health services or individual behaviour change rather than systems-wide governance. Digital technologies are rapidly transforming food production, distribution and nutrition support, but their equity implications for Pacific food systems remain under-examined.

Abbreviations: AI, artificial intelligence; GLP-1, glucagon-like peptide-1; IPCC, intergovernmental panel on climate change; NCDs, non-communicable diseases; PICTs, Pacific island countries and territories; SDGs, sustainable development goals.

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2. What does this paper add to the literature?

This paper applies the Honest Food Framework to assess current Pacific food systems and to model plausible future trajectories under accelerating technological and digital transformation. By contrasting inclusive and extractive scenarios, it foregrounds community agency, governance, and cultural grounding as decisive factors shaping health and equity outcomes. The analysis extends food systems and digital health debates by positioning Pacific communities not as end-users of technology, but as potential co-authors of food-system futures.

3. What are the policy implications?

Food and health policies should move beyond technology adoption toward governance frameworks that embed cultural values, community decision-making and accountability in digital food-system innovation. Policy-makers should ensure that digital tools support food sovereignty, nutrition and resilience rather than reinforcing dependency. These insights are relevant to Pacific countries and other settings facing simultaneous pressures of digitalisation, health inequity and climate change.

1 | Background

1.1 | Global Context

Across the globe, food systems are facing growing challenges brought on by the complex pressures of climate change, global nutrition transition and digital inequity. The global nutrition transition describes a worldwide shift in diets and lifestyle behaviours that accompanies urbanisation, industrialisation and economic development, whereby populations move from traditional, locally-based food systems towards processed, energy-dense diets and reduced physical activity. This transition is now widely recognised as one of the most significant global health challenges, underpinning the rising prevalence of non-communicable diseases (NCDs) across many OECD and middle-income countries. While the United Nations' Sustainable Development Goals (SDGs) emphasise zero hunger and good health, many societies are simultaneously experiencing rising rates of NCDs, loss of biodiversity and declining food sovereignty (Popkin 2006; Popkin and Gordon-Larsen 2004; Hawkes 2006; Hu 2011; Machovina et al. 2015). The increasing industrialisation and commodification of food have widened inequalities across production, distribution and consumption (Moodie et al. 2013; Glanz et al. 2005), undermining local control and ecological balance. Scholars have long debated whether the current global food system can deliver both health equity and environmental sustainability, or whether its structure inherently perpetuates inequity and inappropriate consumption patterns (Lang and Heasman 2015; Clapp et al. 2022). These concerns are particularly visible in the Pacific and Māori contexts, where health inequities reflect globalised and commodified food environments. Food Havens' is a term deliberately introduced by this research team to challenge deficit-framed labels such as 'food deserts' and 'food swamps', and to reflect a strengths-based understanding of Pacific food environments. Research identified that Pacific communities experience disproportionately high burdens of diet-related NCDs, linked not only to individual behaviour but to systemic determinants such as commercial food supply chains, import dependency and ineffective policy environments (Cammock, Conn, et al. 2021). Instead of deficit-based approaches to health promotion, Food Havens adopted a strengths-based, systems-oriented perspective, demonstrating how participatory and culturally grounded frameworks, such as Talanoa and community co-design, can reposition Pacific youth, families and local entrepreneurs as agents of change within the food system (Tonumaipe'a et al. 2021; Conn et al. 2020; Cammock, Tonumaipe'a, et al. 2021).

Building on this foundation, current global debates about 'honest' and 'sustainable' food systems emphasise transparency, trust and interdependence among producers, consumers and ecosystems (Macdonald 2020; Arnot et al. 2016; Dornelles et al. 2022). The Honest Food Framework (Hebda n.d.) extends these ideas, which connects ecological ethics with food-system accountability. However, as this movement gains traction, questions remain about how these principles can be translated into diverse cultural and geographical contexts, particularly in small island and Pacific communities that face disproportionate ecological and economic vulnerabilities.

1.2 | Pacific Food System Context

In the Pacific region, climate change and globalisation have deeply reshaped the food environment. Many Pacific Island countries and territories (PICTs) are heavily reliant on imported processed foods, which are cheaper but nutritionally poor (Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, World Health Organization, Pacific Community 2024). Meanwhile, rising sea levels, soil salinisation and extreme weather events are threatening traditional agricultural practices and local biodiversity (Mazhar et al. 2022). Studies have documented that the erosion of local food production systems has coincided with rising obesity prevalence and increasing burdens of diabetes and cardiovascular disease in Pacific populations. Obesity is an important risk factor for multiple NCDs, while cardiovascular disease, diabetes, cancer and chronic respiratory diseases account for a substantial burden of premature mortality across the Pacific (Swinburn and Wood 2013; Rush et al. 2007). Reflecting a broader population-level transition, Pacific communities have shifted from physically demanding traditional livelihoods, such as fishing, farming and land-based food practices, to increasingly sedentary, urbanised and screen-based lifestyles; the resulting decline in daily physical activity has formed a fatal synergy with the proliferation of ultra-processed, imported foods. This convergence accelerates the burden of diet-related NCDs and contributes to high rates of preventable morbidity and mortality across the region (Davila et al. 2024).

However, Pacific food insecurity is not merely a logistical or agricultural issue. It is also a cultural, social and governance challenge. The disconnection between imported food economies and traditional systems of sharing, reciprocity and land-based identity has disrupted not only nutrition but also cultural cohesion and intergenerational knowledge transfer (Wehi et al. 2023). Some scholars argue that current health interventions, often modelled

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on Western paradigms, fail to address the collective and relational nature of food within Pacific societies (Amataiti et al. 2025). Others highlight the need for Pacific-led frameworks that restore cultural integrity while embracing technological innovation and policy change (Andrew et al. 2022).

1.3 | Cultural Centrality of Food

Food in the Pacific is not simply sustenance, it is a carrier of identity, social order, service and wellbeing. Meals shared in churches, community halls or family gatherings reinforce values of togetherness and care. However, these practices have also adapted under new economic and temporal pressures. With more people working multiple jobs or migrating for employment, convenience foods and fast-food chains have increasingly replaced home-grown or home-cooked meals (Andrew et al. 2022). The cultural significance of eating together remains, but the content of those meals has changed, often toward energy-dense and nutrient-poor options (Burkhart et al. 2025).

Research in cultural nutrition and public health suggests that interventions focusing solely on individual behaviour overlook the collective ethos of Pacific eating traditions. Instead, approaches that integrate community leadership, faith-based engagement and youth participation are proving more sustainable (Waqa et al. 2013; Firestone et al. 2021). These findings point to a broader realisation: food futures must be understood through a lens that combines culture, community and sustainability, not simply through biomedical or market-based models (King et al. 2010).

1.4 | Research Gap

Despite growing recognition of these complexities, there remains a conceptual and practical gap in how sustainable food systems are framed for Pacific contexts, a gap that is widening with the rapid acceleration of technological change in food systems. Current policies and programmes tend to focus on short-term fixes, often overlooking the pace and direction of technology changes in shaping future food environments. This results in reforms that remain overly linear and technocratic, with limited local leadership in decision-making about the future. Consequently, Pacific food systems can become further locked into externally driven agendas and technologies that may not align with cultural values, governance structures or aspiration for food sovereignty.

Given this rapidly changing context, the question is no longer only whether Pacific food systems account for future challenges, but how 'future' itself must be redefined under fast-paced digital and climate transformations. Attempting to model and intentionally engineer food futures using a complex, systems-wide framework like the Honest Food model therefore represents a necessary shift toward anticipatory, rather than reactive, governance, and for our purposes, this helps us to explore appropriate research pathways.

Digitalisation is introducing new forms of inequity into the food system. While Pacific communities are highly engaged online for communication and social connection, digital divide in this context refers to disparities in who has the skills, data access, infrastructure and governance power to use digital tools for health-enhancing purposes. For example, precision agriculture technologies, traceability systems and online food markets often favour resourced actors, while rural communities, older populations and low-income families may be excluded from emerging digital food economies. Without careful design, digital strategies may deepen dependence on external platforms and data owners rather than strengthen community control over food environments. This concern extends beyond digital access to data sovereignty. In this paper, Pacific data sovereignty refers to the authority of Pacific communities to determine what food-system data are collected, how they are interpreted and stored, who may access them and how benefits arising from their use are shared. This is especially relevant to agricultural data, nutrition tracking, traceability systems, climate-risk information and AI-supported decision-making.

In this paper, technology refers broadly to sociotechnical changes affecting food production, distribution, consumption and governance. We distinguish three overlapping categories: digital technologies, including data platforms, artificial intelligence, online markets and digital monitoring tools; production technologies, including precision agriculture, controlled-environment farming and precision fermentation and governance infrastructures, including traceability systems, data standards and platform-based procurement. These technologies are analysed not as isolated tools, but as systems whose effects depend on ownership, governance, scale, cultural alignment and the distribution of benefits.

The challenge is thus not only to make food systems more sustainable but also to ensure that they are culturally grounded, digitally inclusive and socially just in a future increasingly shaped by data-intensive decision-making (Cammock, Conn, et al. 2021; Tonumaipe'a et al. 2021; Conn et al. 2020; Cammock, Tonumaipe'a, et al. 2021; Dornelles et al. 2022; Amataiti et al. 2025; Waqa et al. 2013, Firestone et al. 2021).

1.5 | Aim of the Study and Its Contribution

This paper presents a qualitative conceptual policy analysis informed by the Food Havens programme and structured through the Honest Food Framework (Hebda n.d.) to examine current Pacific food systems and contrasting future trajectories under technological change. Drawing from interdisciplinary research, policy initiatives, and community-based projects in the Pacific, this work explores how 'Food Havens' can serve as spaces, physical, virtual and relational, where food, culture and sustainability intersect. By situating food systems within the broader discourse of health equity, cultural resilience, and digital transformation, this study contributes to the ongoing debate on what constitutes 'sustainability' in diverse contexts. It invites readers beyond the food or health disciplines to reflect on how local knowledge systems can reshape global understandings of wellbeing. Ultimately, the paper proposes that reclaiming Pacific food futures is not only a matter of agriculture or nutrition but an act of restoring ecological, social and digital sovereignty. It examines how ownership, governance, cultural alignment and

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the distribution of benefits determine whether technology supports or undermines Pacific food sovereignty, health equity and ecological resilience.

2 | Methods

2.1 | Study Design and Analytical Orientation

This study used qualitative conceptual policy analysis to examine how technological change may shape Pacific food systems and associated health, equity, cultural and ecological outcomes. It did not involve primary data collection or seek to predict a single future. Instead, it developed contrasting scenarios to examine how different governance conditions may shape the effects of technology.

2.2 | Sources Informing the Analysis

The analysis drew on three sources: insights generated through the Food Havens programme since 2018; peer-reviewed and policy literature on Pacific food systems, health inequities, climate change, food sovereignty and technological change and documented examples of community-led food initiatives and emerging food-system technologies. These materials supported conceptual synthesis rather than systematic evidence review. They were selected for their relevance to the framework, technologies and policy issues examined.

2.3 | Analytical Framework

The Honest Food Framework developed by Hebda (n.d.) was used to structure the analysis. It examines food systems through six interconnected domains: economy and food security; food quality and nutrition; food biodiversity and seeds; culture and community; climate change and ecological integrity. The framework treats food production, distribution and consumption as shaped by wider social, economic, cultural and ecological conditions. When applied to Pacific contexts, it also foregrounds reciprocity, collective wellbeing, cultural continuity and relationships among people, land and ocean (Baum and Fisher 2014). Table 1 summarises the six domains, and Figure 1 presents the framework.

In this study, the six domains of the Honest Food Framework were retained as the primary organising structure. Equity, power and governance are not separately specified as domains within the original framework. We therefore applied an additional cross-cutting Pacific equity and governance lens, reflecting wider food-systems scholarship that emphasises the importance of governance, power relations and decision-making structures in shaping food-system outcomes (Patay et al. 2025). This analytical overlay considered five dimensions: ownership and control; governance and accountability; scale and accessibility; cultural alignment; and the distribution of health, economic and ecological benefits. When applied in this way, the framework also allows attention to reciprocity, collective wellbeing, cultural continuity and relationships among people, land and ocean in Pacific contexts (Baum and Fisher 2014).



FIGURE 1 | The Honest Food Framework. Visual representation developed by the authors with generative AI assistance based on the six domains of the Honest Food Framework (Hebda n.d.); reviewed and edited by the authors.

Figure 1 illustrates the six interrelated domains of the original Honest Food Framework. In the present analysis, these domains are interpreted through the additional cross-cutting Pacific equity and governance lens described above. Equity, power and governance are therefore treated as analytical considerations applied across all six domains, rather than as additional components of the original framework.

2.4 | Analytical Process and Scenario Development

The analysis proceeded in three stages: (1) current challenges and community responses in Pacific food systems were mapped

TABLE 1 | Six interconnected domains in Honest Food Framework.

• Economy and food security	Addressing the relationships between production, access and affordability
• Food quality and nutrition	Ensuring safety, health and nourishment in everyday consumption
• Food biodiversity and seeds	Protecting the diversity of species and knowledge that underpin resilient food systems
• Culture and community	Situating food within social identity, values and collective wellbeing
• Climate change	Recognising food systems as both vulnerable to and drivers of global environmental change
• Ecological integrity	Ensuring environmental sustainability in food production and distribution

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across the six Honest Food domains; (2) to operationalise the cross-cutting Pacific equity and governance lens, relevant technologies were assessed according to five dimensions: ownership and control, governance and accountability, scale and accessibility, cultural alignment and distribution of health, economic and ecological benefits and (3) two contrasting scenarios were developed. The inclusive scenario represents a pathway shaped by Pacific governance, community ownership, public-interest policy and cultural accountability. The extractive scenario represents a pathway characterised by external ownership, market concentration, weak regulation and unequal control over data and infrastructure.

The scenarios are heuristic rather than predictive. Technologies were not classified as inherently beneficial or harmful. Their effects were interpreted as dependent on the conditions under which they are owned, governed and used. For example, precision fermentation may support local food resilience where it is community-governed, culturally appropriate and designed to complement rather than displace land-based food production. The same technology may reinforce dependency where production relies on patented inputs, proprietary knowledge and offshore ownership.

2.5 | Scope and Positionality

The term Pacific does not imply a single or homogeneous context. PICTs, Indigenous Pacific communities and diasporic populations differ in political status, geography, infrastructure, food-production capacity and exposure to technological change. The scenarios identify recurring regional tensions while recognising that their relevance will vary across places.

The author team brings different relationships to Pacific communities, public health, food-system research and the Food Havens programme. The analysis was shaped by Pacific leadership, collaboration and community-engaged research. The scenarios are therefore offered as prompts for further Pacific-led research and deliberation rather than definitive accounts of Pacific food futures.

2.6 | Use of Generative AI-Assisted Tools

Generative AI was used in a limited and supporting capacity during manuscript preparation. Google Gemini Nano (specific model version not recorded) was used to assist with the visual development of Figure 1 between November and December 2025, based on a conceptual structure specified by the authors. Based on the authors' recollection, the figure was developed through approximately two to three iterative rounds of prompting, output review and refinement. The prompts focused on visually representing the six domains of the Honest Food Framework and did not determine the analytical framework, evidence selection, scientific interpretation or findings. The generated outputs were reviewed and manually edited by the authors to ensure conceptual accuracy and consistency with the original framework.

The exact verbatim prompt history was not retained during the initial development, as shown in Figure 1. We therefore report the available details of the prompting process and workflow rather than retrospectively reconstructing prompts. Generative AI-assisted tools were also used for limited language editing and clarity improvement during manuscript revision. All substantive arguments, evidence selection, analysis and interpretation were developed, checked and approved by the authors, who take responsibility for the final manuscript.

The use of generative AI also raises an ethical issue that is particularly relevant to the sustainability focus of this paper. Generative AI systems require computational resources and electricity during model development and inference, with associated environmental impacts that vary according to model architecture, task, hardware, data-centre infrastructure and electricity sources (de Vries 2023; Luccioni et al. 2024). We therefore do not treat the use of generative AI as environmentally neutral. Its use in this study represents a methodological trade-off between limited assistance with visualisation and language refinement and the resource demands associated with AI-supported computation. Because information on the specific hardware, data-centre location, electricity mix and computational resources associated with our interactions was not available to the authors, the environmental footprint attributable to this use could not be quantified.

3 | Analytical Findings: Current Challenges and Community Responses in Pacific Food Systems

This section presents the analytical findings of the study. Drawing on the sources and analytical process described in Section 2, the analysis identified recurring structural challenges and existing sources of community resilience across the six domains of the Honest Food Framework. These findings reflect a conceptual synthesis of Food Havens programme insights, relevant research and policy literature and documented examples of Pacific food-system initiatives, rather than findings from new primary data collection. Table 2 summarises the principal structural challenges and existing sources of resilience identified across the six Honest Food domains. The following subsections examine each domain in greater detail.

3.1 | Economy and Food Security

Economy refers to the state of a country or region based on its production and consumption of goods and services, including the distribution of money (Oxford University Press. Economy n.d.). In island markets, price speaks a language louder than that of season. The cost of rice, bread and oil dictates what ends up on plates long before taste or tradition can intervene. Local food production wanes as families abandon gardens for waged work, and job insecurity translates into food insecurity (Food and Agriculture Organization of the United Nations 2019; Connell and Lea 2002). The logic of affordability masks a deeper dependency: a global supply chain that delivers convenience at the expense of control. Yet, this dependence also deepens structural vulnerability. As imported food prices fluctuate and agricultural

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TABLE 2 | Honest Food in the Pacific: six interconnected dimensions of challenge and resilience.

Honest food domain	Current structural challenges	Existing sources of resilience
Economy and food security	Import dependence, price volatility and market concentration	Local produce markets, cooperatives and community procurement
Food quality and nutrition	Ultra-processed food environments and weak regulation	Community kitchens and faith-based initiatives
Food biodiversity and seeds	Loss of heritage varieties	Seed exchanges and intergenerational gardens
Culture and community	Time pressure, commodification and cultural displacement	Talanoa, shared meals and youth leadership
Climate change	Salinisation, cyclones and crop loss	Locally led adaptation and early-warning systems
Ecological integrity	Soil, water and reef degradation	Ridge-to-reef stewardship, composting and local conservation

capacity declines, households find themselves caught between global volatility and local scarcity. The weakening of community-based food production erodes not only economic autonomy but also the ecological foundations that once sustained it. The erosion of local agricultural land and ecological stability further constrain household resilience, driving not only economic precarity but also rural-to-urban and inter-island migration in search of food and income security (Oxford University Press. Economy n.d.). Nevertheless, community-based alternatives continue to emerge. Food Havens programme work identified church food cooperatives, shared produce stalls, and pay-cycle markets (timed around household income or benefit-payment cycles to improve affordability) that reassert local agency and collective responsibility, reminding that economy, in its original sense, once meant 'the management of the household' (Tonumaipe'a et al. 2021; Conn et al. 2020; Cammock, Tonumaipe'a, et al. 2021; Connell and Lea 2002).

3.2 | Food Quality and Nutrition

Food quality refers to the extent to which food systems are able to provide food that supports health, nutritional adequacy, and the prevention of diet-related conditions rather than merely supplying calories (Hebda n.d.). In this sense, food quality aligns closely with the broader concept of food security discussed earlier, as both emphasise consistent access to food that is safe, nutritious and sufficient to sustain a healthy life. Within nutrition scholarship, food quality is commonly discussed in relation to healthy eating and dietary patterns (Neufeld et al. 2023). However, despite growing awareness of healthy diets, many scholars argue that the contemporary global food system is failing to deliver food that is simultaneously nutritious, affordable and accessible, particularly for socially and economically vulnerable populations. This systemic shortfall has contributed to widespread nutrition-related health inequities and underpins ongoing concerns about the sustainability and fairness of current food systems (Claeys et al. 2021; Akram-Lodhi 2013; Rosin 2013). Instead, it is invariably a commodity judged less by its nutritional or health value and more on the basis of cost and short-term enjoyment. The nutrition transition has given the Pacific a modern paradox: plenty of food with inadequate nourishment. Ultra-processed and imported foods have become increasingly prominent within Pacific food environments (Sievert et al. 2019). Health discourse often places blame on individual 'choice', without considering time, transport and income constraints created by unhealthy food environments, commercial determinants and inadequate policy regulation (Manderson and Jewett 2023). Evidence from the Food Havens research shows families juggling time, cost and nutritional needs to feed children well while also keeping them full (Tonumaipe'a et al. 2021; Conn et al. 2020). Given this, community kitchens, faith-based cooking circles and youth-led digital campaigns are rewriting the menu of possibility, translating nutrition back into the language of shared care (Firestone et al. 2021).

3.3 | Food Biodiversity and Seeds

Over the past decade, global research has increasingly emphasised the importance of diversifying food systems. Biodiversity encompasses the variety of plant and animal species within and across environments (Dwivedi et al. 2017). In rural settings, diversification functions as an adaptive strategy that enables communities to respond dynamically to both risks and emerging opportunities. Through diversification, farmers can reduce vulnerabilities while enhancing their income, access to resources and overall living conditions. Furthermore, diversified food systems are associated with improved health outcomes and the promotion of sustainable diets (Remans et al. 2014). Such diets are defined as those that supply all essential nutrients, including minerals and vitamins, while maintaining minimal environmental impact (Dwivedi et al. 2017). Reduced seed-saving and declining use of heritage crop varieties can threaten agrobiodiversity and intergenerational transmission of associated food knowledge (Food and Agriculture Organization of the United Nations 2019; James 1993). Loss of crop diversity may also narrow dietary diversity and reduce the resilience of food systems (Dwivedi et al. 2017; Remans et al. 2014; Dwivedi et al. 2017; James 1993). Migration, monocropping and climate stress can further accelerate these pressures (Food and Agriculture Organization of the United Nations 2019; James 1993). Seed-exchange practices and intergenerational gardens can, in turn, support both ecological resilience and the continuation of

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culturally significant food knowledge (Food and Agriculture Organization of the United Nations 2019; James 1993).

3.4 | Culture and Community

Sustainable food systems are defined by their capacity to support and strengthen human communities. Moreover, such systems emphasise the preservation and exchange of traditional and locally rooted agroecological knowledge and practices. By doing so, they enhance community adaptation and resilience in the face of environmental and social challenges (Hebda n.d.). Food holds important social and cultural significance within Pacific communities in Aotearoa New Zealand, where food practices are closely connected with family, church, reciprocity and collective wellbeing (Andrew et al. 2022; King et al. 2010). Shared meals and communal eating remain important cultural practices, although changing work patterns, time pressures and food environments have altered what is prepared and consumed (Andrew et al. 2022; King et al. 2010). These findings highlight the importance of ensuring that culturally grounded understandings of food remain central to strategies intended to promote healthy and sustainable food practices. Some communities have begun with small symbolic gestures: a re-ordered buffet line that prioritises locally grown, nutritious foods at the front, a blessing that thanks local growers or a youth-led campaign that re-centres home-grown produce at community gatherings. As food spaces shift from home kitchens to workplaces, church halls and takeaway counters, the setting itself becomes an actor shaping how, when and with whom people eat (Fusi et al. 2024).

3.5 | Climate Change

Despite the global community's ongoing initiatives to mitigate climate change, it remains a critical concern for public health worldwide. The Intergovernmental Panel on Climate Change (IPCC) identifies climate change and its associated health risks as the foremost global health threat of the 21st century. Observable impacts include rising temperatures, irregular rainfall, ecological instability and falling water levels, all of which adversely affect population health and wellbeing (Intergovernmental Panel on Climate Change n.d.). In Pacific settings, climate change directly affects everyday food availability by altering what can be planted, harvested, gathered and eaten. The conversation about adaptation is, therefore, also about mourning. Yet, grief coexists with ingenuity. In Tuvalu, raised-bed gardens now sprout above the tide line; in Samoa, families experiment with drought-resistant taro (Luetz and Nunn 2020). These are not mere coping strategies but quiet declarations of endurance: that sustenance, like the ocean, must keep moving. These local disruptions also reverberate across global food markets, as Pacific nations increasingly depend on imported foods whose prices and availability are themselves destabilised by climate shocks elsewhere.

3.6 | Ecological Integrity

In both New Zealand and the wider Pacific, the erosion of ecological integrity reverberates through agriculture, employment and mobility. Declining soil and ecosystem quality can directly undermine agricultural productivity and the ecological processes on which food production depends (Wurtzebach and Schultz 2016; Gliessman 2015). Ecological integrity represents a comprehensive framework aimed at preserving native biodiversity and enhancing ecosystem resilience (Wurtzebach and Schultz 2016). Sustainable food systems are expected to operate in ways that minimise ecological damage while supporting essential processes such as water regulation, soil formation and overall ecosystem functioning (Hebda n.d.). This perspective aligns closely with the principles of agroecology, which emphasise replicating natural systems through an in-depth understanding of crop, pest and disease dynamics, fostering agrobiodiversity and maintaining natural landscapes (Gliessman 2015). Deforestation, waste accumulation and water contamination affect human health through declining soil quality, unsafe water, disrupted fisheries and contaminated food environments. The decline of ecological integrity also disrupts established relationships among communities, food production and local ecosystems. Emerging ridge-to-reef initiatives, which integrate the management of upland, coastal and marine ecosystems, composting networks and school procurement programmes hint at repair (International Panel of Experts on Sustainable Food Systems (IPES-Food) 2017). These approaches illustrate how food-system resilience can be strengthened through integrated ecological stewardship.

4 | Pathways Forward: Imagining Inclusive Food Futures for Pacific Food Systems

Against these historically embedded structural conditions, Pacific food futures are also being reshaped by climate volatility, accelerating technological change and unresolved colonial legacies. The future is neither predetermined nor evenly distributed; it is continually produced by choices made across institutions, technologies and communities. Furthermore, the focus here is on the food system, yet this is situated within wider global and local systems. To examine how these conditions may shape future food systems, we develop two contrasting heuristic scenarios. Neither scenario is intended as a forecast. Rather, both are grounded in documented technologies, policy developments and community practices already evident in Pacific or comparable food-system contexts and extrapolate from these developments to examine how different configurations of ownership, governance and accountability could shape future outcomes (Dornelles et al. 2022; Brewer et al. 2023; Palu et al. 2025; Getahun et al. 2024; Centre for Social Impact 2023). This pathway depends not only on technological capability but also on enabling structural conditions. These include public investment in local food infrastructure, supportive trade and procurement policies, safeguards against excessive market concentration, Pacific-led governance of land, ocean and data, effective regulation of unhealthy food environments and meaningful community participation in decision-making. Under these conditions, technology may strengthen local production, retain value within communities and improve health equity. Although these scenarios are heuristic rather than predictive, they are grounded in documented technologies, policy developments and community practices already emerging in Pacific and comparable food-system contexts. The scenarios extrapolate from

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these existing developments to examine how different configurations of ownership, governance and accountability could shape their future effects.

4.1 | Scenario 1: Community-Governed Technological Transformation (A Realist Utopia)

Technological relevant to this pathway are already developing across food systems, including precision and digital agriculture, fermentation-based food technologies, digital marketplaces and community-oriented food infrastructures (Dornelles et al. 2022; Getahun et al. 2024). Evidence from precision agriculture, for example, shows the potential of sensor-based monitoring and data-driven input management to improve production efficiency and climate resilience (Getahun et al. 2024). The scenario developed here extrapolates from these existing developments to consider what their effects might be if they were governed through Pacific-led ownership, cultural accountability and public-interest policy. Under these conditions, technological change could strengthen access to fresh, local and culturally meaningful food while supporting ecological resilience.

1. Economy and food security

Digital-enabled localised food production and distribution infrastructure can transform the economic base of Pacific communities. Over recent decades, many PICTs have become increasingly dependent on imported staple foods and ultra-processed products, with associated vulnerabilities to price shocks, supply disruptions and contributing to nutrition transition (Brewer et al. 2023; Palu et al. 2025). Emerging work on precision and digital agriculture suggests that sensor-based monitoring, data-driven input management and spatial technologies can improve yields, input efficiency and climate resilience, particularly beneficial for smallholder systems (Getahun et al. 2024). These existing developments provide a basis for considering how localised production and distribution might operate under different governance arrangements. In the inclusive scenario, small-scale smart processing, cooperative platforms and data-supported logistics would be combined with public procurement and support for locally controlled food enterprises. Such mechanisms are consistent with existing food-sovereignty approaches that seek to retain value, decision-making authority and productive capacity within communities (Centre for Social Impact 2023). Competition policy and procurement rules would also be needed to reduce the risk that digital platforms and supply chains concentrate market power.

2. Food quality and nutrition

In this utopian pathway, nutrition is repositioned from deficit-based interventions or imported processed fixes toward embodied, culturally grounded knowledge supported by real-time data. Evidence from large cohort studies suggests that greater diversity of plant-based foods is associated with healthier gut microbiome profiles and improved metabolic outcomes (Asnicar et al. 2021; Spector et al. 2020). Affordable tools such as continuous glucose monitoring and microbiome analytics can, in principle, support households to align everyday eating with minimally processed, locally sourced foods that resonate with Pacific dietary identities, rather than with ultra-processed imports increasingly linked to obesity and NCDs in Indigenous communities (Chepulis et al. 2025). However, digital nutrition coaching represents a critical design challenge rather than a straightforward solution. Most existing nutrition technologies remain highly individualised and behaviour-change-oriented, with limited effectiveness and a tendency to reproduce guilt, shame or compliance-based logics, and in some contexts to be appropriated for insurance-driven risk management. Within a utopian pathway, nutrition coaching would therefore need to be reoriented toward culturally grounded, relational and collective forms of support. Messaging designed around Pacific values could redistribute nutritional expertise to families, churches and community groups, shifting nutrition from a discourse of individual blame to one of collective empowerment. Through such community-anchored digital nutrition coaching, traditional foodways can be revitalised, and eating becomes an act of cultural affirmation as much as physiological sustenance. These tools would need to operate alongside regulation of unhealthy food marketing, pricing and retail environments, rather than replace population-level public health measures.

3. Food biodiversity and seeds

Rather than allowing agrobiodiversity to erode under homogenising industrial pressures, technology can be mobilised to protect and regenerate seed heritage and microbial diversity. Agrobiodiversity is now widely recognised as a foundation for resilient and sustainable food systems, particularly under climate stress (CGIAR 2025). Community seed banks have been shown to support on-farm conservation, farmer autonomy and locally adapted varietal development in diverse settings (Vernooy et al. 2020). Seed policy, intellectual property protections and public support for community-controlled seed systems would be central to maintaining local control over biological resources and food production knowledge. In a Pacific realist utopia, such initiatives could be extended through digital tools: community-controlled digital seed repositories, paired with AI-driven assessment of climate resilience, would safeguard Indigenous varietals and enable adaptive cultivation strategies as environmental conditions shift (Teixidor-Toneu et al. 2023). Fermentation-based food technologies may also support local resilience where they are community-governed, culturally appropriate and used to complement rather than replace traditional food production. Advances in microbial ecology may further support the continuation and adaptation of culturally significant fermented foods (Gautam et al. 2025). In this model, biodiversity becomes not a relic of the past, but a living infrastructure for future food sovereignty and ecological adaptation.

4. Culture and community

Digital platforms need not disrupt community relations; they can extend and deepen them. Pacific food systems have long been characterised by collectivism, reciprocity and kin-based exchange rather than purely market transactions (Pacific Community (SPC) 2022). Designing digital transformation around these values means using technology to support communal procurement, shared kitchens, cooperative markets and collective decision-making about food production and distribution. Community participation would need to extend beyond

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consultation to shared authority over platform design, procurement systems and food-system priorities. Evidence shows that digitally mediated community organising can strengthen social cohesion and cultural continuity when locally governed (Pescarin et al. 2023). Likewise, digital tools for intergenerational storytelling (talanoa), traditional cooking and food governance can ensure that modernisation does not erase cultural identity but reinforces it as the operating logic of the food system (Haque 2025). In this scenario, culture is not a decorative add-on; it serves as the central organising principle shaping food flows, not merely consumption. Under this pathway, digital platforms and data systems would be governed through Pacific-led protocols. Communities would retain authority over the collection, interpretation, storage and secondary use of agricultural, nutritional and environmental data. Data governance would therefore support collective decision-making and benefit-sharing rather than treating Pacific communities only as sources of data.

5. Climate change

Pacific communities are already on the frontlines of climate change, facing sea-level rise, coastal erosion and climate-linked food insecurity at disproportionate levels (Parsons 2022). In this utopian trajectory, digital agriculture and ecological regeneration converge. Locally governed climate-intelligence systems and early-warning networks can enable anticipatory adaptation and community-specific risk management (Nunn et al. 2024). Public adaptation funding and locally accountable land and ocean governance would determine whether these technologies reach the communities most exposed to climate risks. Resilient crops suited to saline soils, regenerative aquaculture practices and nature-based solutions, especially ridge-to-reef frameworks that integrate land and ocean stewardship, have demonstrated potential for climate-compatible food production grounded in Indigenous ecological knowledge (Our Land and Water 2021). By aligning technological capabilities with place-based expertise, this pathway enables co-evolution with a changing environment rather than attempts to dominate or escape it, sustaining livelihoods while preserving the ecosystems that sustain them.

6. Ecological integrity

When production, consumption and ecological stewardship are co-governed, ecological integrity can become a core component of wellbeing. Pacific environmental governance traditions emphasise relational interdependence between land, sea and people, a principle supported by growing evidence that ecosystems recover most effectively under community-based management (Meffe et al. 2012). Transparent, community-managed data systems could monitor land, water and reef health in real time, while waste-to-resource loops and sustainable catch management restore nutrient cycles and local food webs or the networks of feeding relationships among species within an ecosystem. Effective land, fisheries and environmental regulation would be required to ensure that monitoring technologies support ecological protection rather than legitimise further extraction. 'Ridge-to-reef' strategies demonstrate how integrated stewardship across ecological boundaries can enhance biodiversity and food security (Office of the Prime Minister's Chief Science Advisor 2024). In this vision, human health and ecosystem health are not separate spheres of responsibility: the wellbeing of people and the environment advance together as mutually reinforcing outcomes.

4.2 | Scenario 2: Extractive Technological Colonialism (A Contemporary Dystopia)

In the competing trajectory, technological acceleration intensifies existing inequities. While technology may increase food abundance and efficiency, these gains are captured by external actors who own the infrastructure, platforms and data. In this trajectory, the logics of profit, optimisation and scalability overwrite cultural meaning and ecological reciprocity. The extractive scenario is also grounded in developments already documented within Pacific and wider food systems. These include dependence on imported and ultra-processed foods (Brewer et al. 2023; Palu et al. 2025), concentration of control within global food supply chains (Narula 2024), unequal authority over data and digital infrastructures (Pacific Data Sovereignty Network 2025) and externally driven forms of marine and resource governance that may marginalise customary users and small-scale producers (Mallin 2025; Sulanke and Rybicki 2021). The scenario extrapolates from these existing patterns to examine how technological acceleration could intensify dependency where ownership, infrastructure and decision-making remain concentrated outside Pacific communities. Under such conditions, technological change may increase efficiency while simultaneously concentrating economic value, data ownership and decision-making authority. Trade, procurement and regulatory settings would therefore be central to whether technological change reduces or reproduces existing food-system inequities.

1. Economy and food security

Food becomes plentiful and cheap but is still of poor quality nutritionally and still highly commodified. Automated supply chains favour cheap imports and highly processed staples, further displacing smallholders and weakening local production systems already undermined by colonial trade histories. Profits, intellectual property and data ownership concentrate offshore, while Pacific farmers become precarious contract suppliers to distant markets. The shift toward digital marketplaces accelerates market consolidation and price volatility, increasing vulnerability to global disruptions. Weak competition policy and trade arrangements favouring cheap imports would further consolidate external control over food markets. Far from correcting inequalities, technological food logistics risk deepening them, as control over food shifts from land-based production and local governance to digitally mediated platforms and externally owned data infrastructures (Narula 2024).

2. Food quality and nutrition

Nutrition is redefined as a programmable health outcome rather than a relational act embedded in community and ecology. Highly engineered products, optimised for shelf-life, scale and convenience, dominate energy intake, while diets become less diverse in micronutrients and lower in dietary fibre. Weight-loss pharmaceuticals such as GLP-1 agonists are promoted as solutions to diet-related disease, sidelining the structural drivers of poor nutrition (Radio New Zealand 2025). In

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some systems, digital nutrition coaching becomes punitive rather than empowering, tethered to health insurance differentials and behaviour-surveillance metrics. In the absence of effective regulation, commercial actors may use digital nutrition systems to individualise responsibility, while unhealthy food environments remain unchanged. Highly individualised or surveillance-based nutrition systems may shift attention away from nourishment and structural determinants toward compliance with externally defined behavioural and metabolic metrics (Telegraph Media Group 2025).

3. Food biodiversity and seeds

The same fermentation-based food technologies may deepen dependency where production relies on patented organisms, proprietary inputs and externally controlled infrastructure. Under these conditions, industrial production may displace local cultivation and weaken Indigenous control over seeds, knowledge and food production (Bruins 2025). Proprietary seed and input regimes may restrict farmer autonomy and shift control over genetic resources and production knowledge to external firms. Traditional crops persist only as symbolic branding for niche consumer markets, severed from their cultural and ecological functions. As genetic resources are commercialised, biodiversity shrinks into a curated subset defined by profit rather than adaptability. Ecological resilience is thus diminished precisely when climate volatility demands diversification.

4. Culture and community

Digital infrastructure restructures social life through algorithmic priorities. Platform-optimised procurement and diet recommendations override collective decision-making, shifting authority from intergenerational food leadership to external recommendation engines. Token consultation may leave decision-making power with platform owners, state agencies or commercial partners rather than Pacific communities. Rituals and shared meals remain, yet they lose autonomy over what, when and how food is produced and consumed. In addition, Pacific cuisines become commodified 'ethnic content' in global markets, while the communal ethics of feasting are replaced by efficiency logics. Moreover, structural exclusion deepens, and it shows that underrepresentation of Pacific peoples in tech-education pathways and AI-related industries ensures limited participation in shaping digital systems that govern Pacific futures (Pacific Data Sovereignty Network 2025). Contemporary Pacific data-sovereignty initiatives already reflect concerns about who controls data, analytical authority and the benefits generated through digital systems (Pacific Data Sovereignty Network 2025). In the extractive pathway, agricultural, nutritional and behavioural data are captured through proprietary platforms, while ownership, analytical authority and commercial value remain offshore. Pacific communities may generate the data on which decisions are based without having meaningful control over how those data are interpreted, shared or reused.

5. Climate change

Climate adaptation may also reproduce existing inequalities when access to technologies, finance and decision-making authority is uneven. Pacific communities already experience highly unequal exposure to sea-level rise, coastal erosion and climate-related food insecurity (Parsons 2022), while research on Pacific climate resilience emphasises the importance of locally grounded knowledge and community authority in adaptation processes (Nunn et al. 2024). In the extractive scenario, adaptation technologies and finance would instead be allocated primarily through market capacity or externally determined priorities, potentially disadvantaging rural, outer-island and less-resourced communities. Under these conditions, technological adaptation could manage climate risk without addressing the underlying distribution of power and responsibility.

6. Ecological integrity

Technological precision, in many cases, increases extraction rather than ending it, and lands and oceans risk being reclassified as investment assets under blue-economy and green-growth regimes that often prioritise capital accumulation over ecological care. These regimes promote a narrative of 'sustainable growth', yet critics argue that green growth frequently masks intensified exploitation under a veneer of environmental planning. In many contexts, marine and coastal ecosystems become commodified and treated as 'blue assets', while investments channel into capital-intensive infrastructure and extractive industries rather than community-managed stewardship (Mallin 2025). Blockchain-based traceability systems may improve transparency and accountability in food and fisheries supply chains, but their effects depend on who controls the data, standards and platforms (Ellahi et al. 2023; Asia-Pacific Economic Cooperation 2024). Without strong public-interest regulation and meaningful participation by small-scale producers, such systems may reinforce private governance or create new barriers to market access. Similar concerns arise in some blue-economy initiatives, where externally driven investment and governance may marginalise small-scale fishers and customary marine users (Mallin 2025; Sulanke and Rybicki 2021). Under these conditions, monitoring and traceability may legitimise continued extraction rather than strengthen community stewardship.

5 | Discussion

5.1 | Health as the Ultimate Test of a Realist Utopia

Any claim to a realist utopia must ultimately be tested against its health consequences. For Pacific communities, food systems are already lived through the epidemiological reality of diet-related NCDs, which continue to have devastating and disproportionate impacts on health, longevity and everyday wellbeing (Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, World Health Organization, Pacific Community 2024; Swinburn and Wood 2013; Rush et al. 2007; Sievert et al. 2019). These outcomes are shaped not only by individual behaviour but also by food environments, commercial determinants, import dependence and wider socioeconomic constraints (Cammock, Conn, et al. 2021; Amataiti et al. 2025; Manderson and Jewett 2023). In this context, abundance that merely increases caloric availability, even if locally

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produced or technologically optimised, offers little transformation if it fails to interrupt the structural drivers of obesity, diabetes and cardiovascular disease. This reframes food futures as a matter of embodied justice rather than supply efficiency. From a realist perspective, technological sophistication without measurable improvement in diet-related health inequities cannot be considered emancipatory. Health, here, is not an ancillary benefit of a better food system, but the most immediate and unforgiving indicator of whether sovereignty, care and cultural authorship have been meaningfully restored.

5.2 | The Fragility of a 'Realist Utopia'

Scenario 1 assumes that technology can support local food sovereignty when it is locally governed, culturally accountable and designed to retain economic and social value within Pacific communities. This assumption is consistent with food-sovereignty scholarship and Pacific food-system work that emphasise local authority over production, resources and decision-making (Claeys et al. 2021; Akram-Lodhi 2013; Centre for Social Impact 2023). However, technologies such as precision agriculture, digital seed systems and data-driven nutrition tools are not inherently equitable. Their effects depend on who controls land, data, infrastructure and decision-making (Narula 2024; Pacific Data Sovereignty Network 2025). A food system may be locally grown while its profits, algorithms and decision rules remain offshore.

Moreover, the abundance discourse itself risks erasing the costs of making abundance. If the Pacific's future nourishment depends on extractive footprints displaced onto other vulnerable lands, then sovereignty is merely rebranded dependency. There is also a risk that digital empowerment may be replaced by punitive surveillance and individualised risk management. This should be distinguished from necessary public-interest regulation of harmful food environments and commercial practices. Digital nutrition and metabolic-monitoring technologies may expand access to personalised health information, but they can also reinforce individualised approaches to risk if deployed without attention to structural determinants of health (Baum and Fisher 2014; Manderson and Jewett 2023). In addition, where data governance is externally controlled, such systems may create new forms of surveillance or data extraction rather than strengthening community authority (Pacific Data Sovereignty Network 2025).

Finally, no utopia is possible if its architects stand outside the community it claims to serve. Meaningful Pacific participation in technological governance is therefore essential. Existing Pacific data-sovereignty work has highlighted the importance of Pacific authority over the design, governance and use of digital and AI systems (Pacific Data Sovereignty Network 2025). Without such participation, technological transformation may reproduce rather than reduce existing asymmetries in decision-making power. The danger is not that technology fails, but that it succeeds in the wrong direction.

A realist utopia, then, is not the triumph of technology but the triumph of relational power: communities designing systems that honour their own cosmologies of care; abundance measured not only in yield but in dignity and innovation that expands the circle of who gets to flourish. Anything less risks becoming a softer mask for the same colonial logics, stitched together with modern circuitry.

5.3 | Toward a Realist Utopia: What Must Be Done?

The dual scenarios reveal both what is possible and what is at stake. A more equitable Pacific food future will not emerge naturally from technological progress; it requires specific institutional arrangements that redistribute decision-making authority, retain benefits within communities and create mechanisms for accountability. The transitions below therefore distinguish broad principles from the policy and governance mechanisms through which they could be operationalised. Table 3 summarises these governance principles, corresponding policy mechanisms, practical applications and supporting precedents.

- From Digital Access to Digital Sovereignty

Narrowing the digital divide is not enough if Pacific communities lack power over how data are collected, stored, interpreted and used. Digital sovereignty requires Pacific-led governance of agriculture, nutritional, environmental and community data, including meaningful consent, collective decision-making, locally accountable storage, limits on secondary commercial use and fair benefit-sharing. Connectivity without these protections may expand opportunities for data extraction rather than community control. Connectivity without control simply enlarges the surface area for extraction. A realist utopia instead demands community-owned data infrastructures, Indigenous AI principles and robust consent processes that determine what is collected, by whom and for whose purposes. Digital tools must be accountable to Pacific worldviews rather than Pacific communities being made accountable to opaque digital systems. In policy terms, this could include community-approved data governance agreements specifying what data may be collected, where data are stored, who can access them, conditions for secondary use and how benefits are shared. Publicly funded digital food or health projects could also require Pacific representation in governance bodies and community approval of data-use protocols. Pacific-led AI and data-sovereignty initiatives provide existing precedents for these forms of governance (Pacific Data Sovereignty Network 2025).

- From Climate Adaptation to Climate Justice

Adaptation framed only as risk management treats Pacific communities as objects of resilience rather than subjects of rights. Climate-compatible food systems must therefore be built around Indigenous land and sea stewardship, investment in community-governed production and protection of seed biodiversity as a collective asset. 'Innovation' here is not limited to imported technologies, but includes Pacific-led ecological experimentation and legal frameworks that recognise loss, damage and historical responsibility. However, Pacific climate justice cannot be achieved through adaptation within the islands alone. It also requires rapid and sustained international mitigation to limit further warming, alongside adequate climate finance and

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TABLE 3 | Translating relational governance into policy mechanisms.

Governance principle	Specific policy or governance mechanism	What this looks like in practice	Supporting precedent
Digital sovereignty	Community data-governance agreements	Community authority over collection, storage, access, secondary use and benefit-sharing	Pacific data-sovereignty initiatives (Pacific Data Sovereignty Network 2025)
Climate justice	Locally governed adaptation funding + international mitigation commitments	Community-defined allocation criteria alongside climate finance, mitigation and loss-and-damage mechanisms	Pacific climate-resilience and regional policy (Parsons 2022, Nunn et al. 2024; Pacific Islands Forum Secretariat 2022)
Economic agency	Public and school procurement rules	Preference for local and culturally appropriate food suppliers; reduced barriers for small producers	Pacific school food and food-sovereignty approaches (Burkhart et al. 2025; Centre for Social Impact 2023)
Shared authority	Co-governance and formal decision rights	Pacific representatives hold decision-making rather than advisory-only roles	Pacific-led and Talanoa-based governance approaches (Tonumaipe'a et al. 2021; Conn et al. 2020; Cammock, Tonumaipe'a, et al. 2021)
Structural cultural integration	Cultural criteria embedded in policy and evaluation	Reciprocity, collective wellbeing and cultural continuity included in procurement and programme criteria	Community-led Pacific food initiatives (Burkhart et al. 2025; King et al. 2010)

support for loss and damage. Pacific regional policy has consistently emphasised that local resilience must be accompanied by stronger global emissions reduction and international responsibility for climate action (Pacific Islands Forum Secretariat 2022). Operational mechanisms could include ring-fenced adaptation funding governed jointly with affected communities, locally defined criteria for allocating adaptation resources and requirements that climate technologies be assessed against food-security and equity outcomes. These local mechanisms need to sit alongside international mitigation, climate finance and loss-and-damage commitments (Parsons 2022, Nunn et al. 2024; Pacific Islands Forum Secretariat 2022).

- From Market Participation to Economic Agency

Inviting Pacific growers to 'participate' in markets while rules, prices and platforms are set elsewhere merely reproduces dependency. A realist utopia requires shifting from being peripheral suppliers in global value chains to building circular local economies: community-based food cooperatives, youth-led enterprises and policy settings that keep value, knowledge and profit within Pacific communities. Economic agency means deciding what to produce, for whom and under what terms, not only gaining access to someone else's marketplace. Specific policy mechanisms include public and school procurement rules that prioritise locally produced and culturally appropriate foods, support for cooperative or community-owned logistics platforms, and procurement contracts that reduce barriers for small local growers and food enterprises. Such mechanisms can shift participation from simply accessing markets toward retaining a greater share of value and decision-making authority locally (Burkhart et al. 2025; Getahun et al. 2024; Centre for Social Impact 2023).

- From Cultural Tokenism to Structural Integration

Culture cannot remain a decorative addition to technocratic reform. Pacific values of reciprocity, collective wellbeing and respect for land and ocean should be embedded in the decision-making criteria and accountability mechanisms that shape school procurement, urban planning, digital platform design and national food policies. In this configuration, culture is not an additional justification applied after decisions are made but a principle that informs how priorities, processes and outcomes are defined. Structural integration requires cultural values to shape formal decision criteria rather than to operate only as consultation inputs. This could include Pacific representation with decision-making authority on procurement and programme governance bodies, cultural criteria within food procurement standards, Talanoa-informed engagement requirements and evaluation frameworks that assess collective wellbeing, cultural continuity and reciprocity alongside conventional health or economic outcomes (Tonumaipe'a et al. 2021; Conn et al. 2020; Cammock, Tonumaipe'a, et al. 2021; Burkhart et al. 2025, King et al. 2010). Digital storytelling and Talanoa-based platforms can also support intergenerational knowledge exchange and cultural continuity when their design, content and governance remain under Pacific control (Nunn et al. 2024; Our Land and Water 2021).

These shifts do not guarantee a realist utopia, but they define the minimum conditions under which technology can serve Pacific flourishing rather than extractive continuity. Without them, the utopian scenario risks collapsing back into the softer face of the dystopia already in motion. For policymakers, these transitions require coordinated action across food, health, digital and environmental policy. For policymakers, these transitions imply a set of identifiable levers rather than a single policy intervention. These include procurement rules that favour local and culturally appropriate food, formal community roles in data and programme governance, community-approved data-use agreements, investment in cooperative or community-controlled infrastructure, equitable climate-finance arrangements and competition and intellectual-property safeguards that limit excessive concentration of control. The common principle is not simply

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participation, but a redistribution of decision-making authority, accountability and benefit.

5.4 | Research Implications

Future research should empirically test how these governance conditions operate across diverse Pacific settings. Priorities include Pacific-led evaluation of digital agriculture and nutrition initiatives, comparative research across island and diasporic contexts, analysis of data ownership and benefit-sharing and longitudinal assessment of whether technological interventions improve food sovereignty and diet-related health equity.

5.5 | Strengths and Limitations

This analysis has several strengths. It integrates health, culture, economy and ecology within a single food-systems framework, treats technology as a governance issue rather than a neutral intervention and uses contrasting scenarios to make policy choices visible. However, the paper is conceptual and does not present primary empirical data or a systematic review of all relevant technologies. Its pan-Pacific framing cannot capture the political, cultural and infrastructural diversity of Pacific settings and some examples are more applicable to particular countries or diasporic communities than others. The scenarios should therefore be interpreted as analytical prompts requiring further Pacific-led empirical validation and local adaptation.

6 | Conclusions

Using the Honest Food Framework to model alternative Pacific food futures has shown that technology alone will not determine outcomes; governance and cultural authorship will. The same innovations that promise sovereignty and resilient local food systems can also entrench extraction if Pacific communities are not meaningfully positioned as decision-makers. This thought experiment highlights the need for anticipatory governance, shifting from reactive responses to climate and nutrition crises toward proactively shaping the rules, values, and power relations that will define tomorrow's food systems. Ensuring that digital, ecological, and economic transformations align with Pacific worldviews is therefore not an optional enhancement but a precondition for equity. Realist utopias are possible but not inevitable. The crucial work now is to ensure that Pacific ingenuity does more than adapt to change; it directs the future, so that food remains a source of identity, dignity, and self-determination.

Author Contributions

Conceptualization: Cath Conn and Cassie (Xi) Wang. Methodology: Cath Conn. Software: Cassie (Xi) Wang. Validation: Radilaite Cammock and Daysha Tonumaipe'a. Formal analysis: Cath Conn and Cassie (Xi) Wang. Investigation: Radilaite Cammock and Daysha Tonumaipe'a. Resources: Cath Conn and Radilaite Cammock. Data curation: Cassie (Xi) Wang and Daysha Tonumaipe'a. Writing – original draft preparation: Cassie (Xi) Wang and Cath Conn. Writing – review and editing: Cath Conn, Radilaite Cammock and Daysha Tonumaipe'a. Visualization: Cassie (Xi) Wang. Supervision: Cath Conn and Radilaite Cammock. Project administration: Cath Conn. Funding acquisition: Cath Conn. All authors have read and approved the submitted version of the manuscript.

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Ethics Statement

Ethics approval was not required for this conceptual policy analysis because the manuscript does not report new human participant data.

Conflicts of interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing is not applicable to this article because no new empirical datasets were generated or analysed for this conceptual paper.

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