



Discussion brief

Nutrition and food systems in the Pacific

December 2023

Background

In July 2023, CSIRO hosted a workshop in Canberra, Australia with SPC and other Australian agencies (DFAT, DAFF, DCCEW, ACIAR) to connect on food systems research and activities in our region. A food systems approach to improving health and nutrition, specifically addressing the challenge of increasing rates of non-communicable diseases (NCDs), was identified as a potential area of collaboration between SPC and CSIRO.

This discussion brief has been prepared to frame further discussions between SPC and CSIRO about how the two organisations can combine their strengths to tackle the nutrition challenge in Pacific Island Countries and Territories (PICTs). It is proposed that these strengths lie in both organisations' multidisciplinary research which is what will be needed to enhance the resilience of food systems in our region in the face of NCDs and climate change.

The table below outlines intersections between NCDs, food systems and climate as a starting point for discussion about how SPC and CSIRO can work collectively in this area.

Key factors relating to nutrition in the Pacific

Non-communicable diseases	A shift towards a more energy-dense nutrient-poor diet is increasing the prevalence of obesity and NCDs. Low production and consumption of traditional and local healthy and nutritious foods. Affordability and access to healthy diets remains a key challenge. Preference for ultra-processed foods which are cheap, do not require refrigeration, have a long-shelf life, are easy to prepare and signal an element of wealth to the community. There are multiple and interrelated social, cultural and institutional drivers that influence food and health choices and need to be addressed systematically to reduce the prevalence of NCDs. Additionally, the built environment can enable or hinder good health outcomes. These need to be addressed systemically to reduce prevalence of NCDs.
Food systems	Declining number of people engaged in agriculture leading to a loss of traditional knowledge and lower food production.

	<p>Wide geographical spread, inadequate infrastructure and transport, and lack of storage facilities, including cold storage.</p> <p>Limited arable land, with poor soils, limited water supply, and fragile natural environments.</p> <p>Poor agricultural practices and limited access to technology, knowledge, and markets.</p> <p>Limited technology and mechanisation for value-adding / processing.</p> <p>Food safety, including unregulated pesticide use and spoilage.</p> <p>Depleted oceanic resources.</p> <p>High reliance on imported food.</p> <p>Significant food waste, including post-harvest losses.</p>
Climate	<p>High vulnerability to climate change; rising sea levels, increased temperatures, changing patterns of rainfall and extreme climate events (droughts, storms, cyclones).</p> <p>Climate projections for the region highlight that extreme climate and weather patterns are accelerating.</p>
NCDs + food system	<p>Decline in domestic availability and affordability of traditional foods has contributed to a rapid nutrition transition in the Pacific, evidenced by the high rates of NCDs.</p> <p>Logistical and supply chain issues often make it more convenient and cheaper to stock foods such as tinned meats, instant noodles, and sugar-sweetened beverages, than fresh food.</p> <p>Initiatives to support the cultivation of healthy food (including aquatic food) are a critical step in increasing the consumption of healthy food, especially in rural areas.</p>
NCDs + climate	<p>Extreme weather events are likely to shift, change and/or disrupt livelihood opportunities and subsequently reduce/change food intake which may lead to acute and long-term health effects.</p> <p>Sixteen PICTs will be unlikely to have sufficient reef fish availability to meet their protein needs; nine are expected to have a shortage while seven will have difficulties supplying reef fish to growing urban populations.</p> <p>Climate change-induced migration is increasing urbanisation which is associated with increased access to energy-dense nutrient-poor foods.</p> <p>Gender, social norms, power relations, and socioeconomic dynamics mean that the impacts of climate change are experienced differently among women – this has implications for women and family health.</p> <p>Climate change will likely exacerbate existing the effects of NCDs. For example, increased temperatures are likely to complicate pre-existing obesity and type 2 diabetes.</p>

	<p>Potential damage to health system infrastructure from climate change will reduce the capacity to manage the burden of NCDs in the region.</p>
<p>Climate + food systems</p>	<p>Nearly all components of the food and health system are impacted by climate change. It negatively impacts the four pillars of food security: availability, access, utilisation, and stability. See Figure 1.</p> <p>Reduced global crop yields are expected to increase the volatility of world food prices which will inevitably impact food access for those PICTS heavily reliant on food imports.</p> <p>The transition from La Niña to El Niño weather patterns is expected to reduce yields and lead to failed crops due to extended dry seasons and extreme temperatures and increase the incidence of pests and diseases.</p> <p>Long-established local disaster response strategies such as food preservation and storage, traditional famine foods and inter-community trade have been eroded by reliance on food assistance following extreme events.</p> <p>Staple crops in the Pacific appear to be more climate-resilient than cereal crops, especially in the short-term.</p> <p>Addressing the multidimensional impacts of climate change on Pacific food systems requires a comprehensive approach that combines adaptation and mitigation strategies, international cooperation, sustainable development planning, and support for local communities to build resilience in the face of challenges.</p>
<p>Climate + NCDs + food systems</p>	<p>The high vulnerability of Pacific food systems to climate change, limit their capacity to support healthy and sustainable diets. Nutrition will be affected by reduced food availability, access and stability, impaired livelihoods, and increased dependency on imported foods.</p> <p>Decline in fresh fish availability has been linked to an increased consumption of less expensive and less nutritious imported protein sources.</p> <p>Climate change is likely to exacerbate already increasing rates of urbanisation in the region, which can offer some health benefits, however, it has also been associated with impaired food and nutrition security due to increased requirement for income to meet food needs, reduced access to land for household gardens and locally grown foods and increased physical access to, and reliance on, store-bought, processed foods.</p> <p>Migration can destabilise traditional social support systems such as food sharing in times of food shortages. On the other hand, remittances may result in an increased reliance on imported foods, a reduction in local agriculture and increased sensitivity to outside markets.</p> <p>Food assistance provision may undermine traditional food security and can lead to permanent shifts in dietary patterns from a healthy local diet to an increased reliance on less nutritious imported foods.</p>

Proposed area of SPC-CSIRO focus

A range of strategies to tackle the NCD crises have been proposed including supporting healthy food environments, nutrition education, regulatory measures such as taxes, subsidies, labelling, marketing, and nutrition standards. These strategies have also been identified as double-duty or triple duty-actions to address the Global Syndemic (obesity, climate change and malnutrition)⁽¹⁾ indicating that there may be win-win solutions for tackling climate change and NCDs. Such strategies require a systems approach that takes multisectoral action (as is recognised by the Pacific NCD Roadmap). Other actions have been identified to strengthen linkages between nutrition and climate change across the WHO health system pillars (see Appendix 1).

While a range of strategies have been proposed, research is still needed to identify evidence-based interventions that maximise nutrition at all steps of the food supply chain. Research on climate mitigation and adaptation in the food system is predominantly focused on food production⁽²⁾. A recent review found that this is no different in the PICTS (Figure 1)⁽³⁾. There is little information, let alone specific guidance, on how to mitigate and adapt to climate change at other stages in the value chain. Research on the impacts of climate change on nutrition is growing, but it could be strengthened and further developed, especially in relation to NCDs. Many studies are limited by their inability to establish causality, use of secondary data (designed for varying objectives), inability to detect results in subgroups, and complex confounding factors^(4,5). Figure 1 outlines a range of entry and exit points for increasing net nutrition across the food supply chain under climate change⁽²⁾.



Figure 1. Entry and exit points for increasing net nutrition across the food supply chain under climate change⁽²⁾.

The research capabilities of SPC and CSIRO span multiple sectors in the food system. SPC has combined competence in multiple areas related to the "blue" and "green" nexus of food production, consumption, trade, and policy. This includes work in health, climate and oceans science, disaster resilience, agriculture and forestry, fisheries and aquaculture, water, energy, culture, human rights, youth, gender, and statistics. CSIRO research and technology includes food production and manufacturing, biosecurity, nutrition, sustainability, climate, marine science, soil science, energy, and water management.

There is an opportunity to combine capability, knowledge, and experience from both organisations to strengthen the resilience of Pacific food systems in the face of the challenges of NCDs and climate change. It will be imperative that this opportunity is in line with Pacific priorities being articulated through the Regional Research Agenda (RRA) framework.

Next steps

It is proposed that a small group of researchers from SPC and CSIRO working in nutrition and food systems come together to share their knowledge and experience, using this discussion brief as a starting point to identify potential future collaboration.

References

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Appendix 1

Summary of key actions required to strengthen linkages between nutrition and climate change across the WHO health system pillars ⁽³⁾

Governance and Leadership

- Ensure nutrition is addressed in climate resilient development and national climate change processes, plans and programmes (such as NAPs NDCs)
- Increase policy coherence and multidisciplinary collaboration at local, regional, national and international levels to enhance food chain sustainability and local access to adequate nutrition
- Promote rights of vulnerable people to essential livelihood resources, including land rights and access to or protection of fishing grounds
- Promote national commitment to shift towards healthy, sustainable diets

Financing

- Mobilize existing and emerging climate funds to support nutrition-focused adaptation actions and target most vulnerable populations, such as women and children in communities most at risk of undernutrition
- Ensure that national adaptation plans include adequate budgetary allocations to address nutrition problems

Capacity

- Raise awareness on nutrition and climate change among decision-makers and policy-makers
- Build clinical and community-based management capacity of undernutrition
- Health personnel trained in the use of climate information and early warning systems
- Promote gender equality and girls' education
- Support the development of strong institutional frameworks and human resources to implement nutrition-based agendas

Service Delivery

- Implement short-term emergency and seasonal safety nets that are gender-sensitive (such as food- and cash-transfer and micro-finance initiatives to increase financial access to foodstuffs)
- Use school-based approaches (school feeding programmes, school gardens, nutrition education) to include considerations of climate variability and long-term change into existing nutrition initiatives
- Provide education on healthy diets and sustainable food systems
- Develop nutrition early warning and early response systems; and improve contingency planning

Information

- Refine the understanding of potential impacts of climate variability and change on national nutrition, including for high-risk populations and areas, and seasonal/acute nutrition risks
- Identify the effectiveness of interventions to promote community level nutritional resilience to climate change
- Conduct participatory, nutrition-focused risk assessments and risk reduction plans
- Strengthen surveillance systems – health and environmental
- Improve the use of nutrition early warning/early response systems

Technologies

- Integrate farming systems exploiting synergies of horticulture, aquaculture and small livestock rearing to reduce waste and expenses on agricultural inputs; and increase food production diversity
- Promote renewable energy use (such as biogas and solar); seek alternative energy sources to hydropower that may be unavailable during periods of drought
- Promote strategies that aim at reducing the food sector carbon footprint through sustainable food production, food consumption and waste reduction