



Concept note: Towards more resilient food systems in Pacific atolls

Food system challenges for Pacific atolls

The unique characteristics of atolls - their low-lying geography and remoteness - make them especially vulnerable to rising sea levels, saltwater intrusion, and extreme weather events. These vulnerabilities threaten the resilience of atoll food systems, limiting agricultural productivity and disrupting local food supplies. They are exacerbated by global events, such as the impact of COVID19 on smallholder livelihoods and supply chains, and disruptions to agri-inputs due to international conflicts, both of which substantially increased the cost of food. The dispersed nature of atolls makes it difficult to transport fresh produce between islands, which increases reliance on processed foods, leading to food insecurity and greater prevalence of non-communicable diseases (NCDs). Close links between land and marine ecosystems mean that environmental degradation, pests, and resource depletion have widespread and long-lasting impacts.

Australian support for the Pacific

Australia has a long-standing commitment to supporting Pacific nations in improvements in agricultural development and resilience to natural disasters. In the last five years, the Australian Government has become more proactive in its engagement with Pacific neighbours and their national priorities, as evidenced by increased budget and programs focused on climate change and adaptation, water management, soils and crop management, market development, health, biosecurity, anti-microbial resistance, plastic waste, circular economy and infrastructure, all underpinned by broad objectives of social inclusion and sustainability.

As Australia's national science agency, CSIRO has engaged in decades of collaboration in the Pacific on scientific priorities spanning climate and disaster risk, agriculture, fisheries, health and biosecurity, and resilient livelihoods. Through collaboration in major regional programs and initiatives, CSIRO has nurtured trusted relationships with Pacific governments, regional organisations (SPC, SPREP), non-governmental organisations (NGOs) and the private sector. Examples include the [Pacific Soils Partnership](#), [regional cooperation on marine waste](#), and enhancing access and reliability of [climate change information](#).

CSIRO's Pacific Agrifood Futures initiative

In 2023 CSIRO began a new initiative to build collaborations and networks between Australian and Pacific knowledge systems to better understand and enable Pacific agrifood systems to respond to current and emerging challenges impacting their resilience and sustainability. As part of Pacific Agrifood Futures, CSIRO is looking to support food systems resilience on atolls. Three key aspects of CSIRO's approach are as follows.

1. Aligning with and contributing to existing policies and priorities

CSIRO is seeking to develop and support transdisciplinary research that is aligned with Pacific national government priorities and synergistic to regional organisations' research agendas. Pacific atolls nations have several programs and initiatives contributing to food systems pathways, that any future activities could connect with.

2. Developing collaborative research for food systems resilience in atolls

The complex and interconnected nature of atoll food systems requires an integrated and collaborative approach to enhancing resilience. This includes combining different types of knowledge (such as local,

traditional, and scientific research), and working in partnerships in a co-design process. CSIRO aims to support and connect projects and organizations to sustain a shared knowledge-base, brokering partnerships and adding value where needed. This approach will help to enable an innovation ecosystem among local and regional actors engaged in food systems.

3. Taking a systems approach

Pacific nations have articulated the importance of a systems approach in tackling agriculture and food challenges in a holistic way. Rather than focusing on individual components of the food system, a systems approach recognises and tries to make explicit the interactions and feedback loops that exist along production and value chains, from governance to consumption and health, and at the intersections of agriculture, climate, ecology, and well-being. This requires interdisciplinary (and often transdisciplinary) analysis and collaboration to identify synergies and manage trade-offs inherent in achieving social, economic, and environmental sustainability. Perspectives across government, academia, industry, civil society, and local communities are needed to co-design effective solutions to food system challenges.

Potential programs of work

- Mapping food systems to enhance adaptation pathways across different scales, including embedding adaptation into existing food systems policy frameworks and integration across sectors.
- Integrated water management, including rainwater harvesting, recycled water treatment technology for agricultural use, ecological restoration, and using perched water tables in traditional pits.
- Circular economy practices that focus on soil fertility, compost, mulch, water retention, organic waste, and livestock systems.
- Strategies to secure sustainable and inclusive value chains that enhance healthy food accessibility, affordability, and convenience.
- Characterizing food consumption patterns and behaviours, including food sources, preferences, and opportunities for improving nutrition.
- Understanding how nature-based solutions contribute to atolls food systems resilience, including integrated water and soil management, ecosystem restoration, and agroforestry.
- Supporting networks for regional knowledge sharing, including atoll food systems resilience, nature-based solutions, and integrating traditional and non-traditional knowledge.
- Understanding the nexus of climate change, human migration, and food systems to develop regional discussions on the implications.

Expected outcomes

- Strengthened science-policy relationships within countries, and between Australia and atoll nations, contributing to knowledge-sharing, coordination, ongoing partnerships and collaborations.
- Improved capability within atoll nations to develop systems approaches to food resilience that recognise multiple and intersecting issues of climate, poverty, and natural resource degradation.
- Locally-driven solutions to climate adaptive agriculture that combine traditional knowledge, nature based solutions, and other scientific contributions for long-term sustainability.
- Investment catalysed for a systems and partnership approach that align with government priorities, moving away from isolated, siloed interventions.