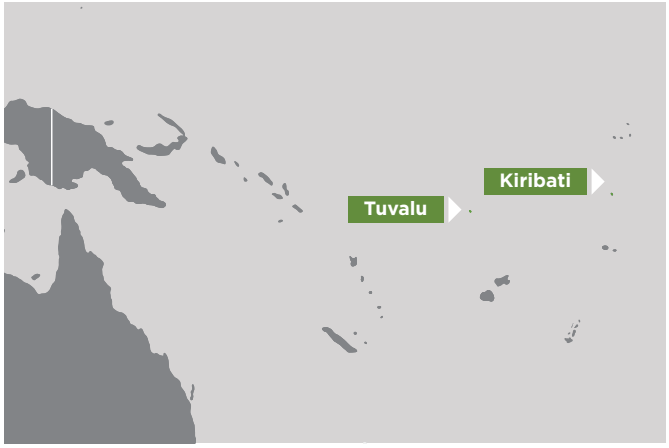
Australian Government
Australian Centre for International Agricultural Research

Soil and Land Management

Improving soil health, agricultural productivity and food security on atolls



Overview

Atolls of the Pacific islands are among the most vulnerable communities to the impacts of climate change and are facing major challenges to their food and income security.

Malnutrition is a significant concern and non-communicable diseases (diabetes, heart disease and micronutrient deficiencies) are increasingly evident as awareness of the effect of poor diet is low. Diets in Kiribati and Tuvalu have traditionally been based on fish and other marine animals and heavy on starch (giant swamp taro and breadfruit), with some fruits but few vegetables. Agricultural production in both countries is restricted by lack of seeds, water shortages and salinity, poor soils, and lack of tools and knowledge of farming practices, and limited guidance from extension services. As a result of limited agricultural production, Kiribati and Tuvalu consume more than they produce.

In order to achieve food security on atolls, there is a need to address the above critical issues by building capacity of key stakeholders to ensure soil constraints are addressed in order for the households of Kiribati and Tuvalu to produce starchy staples and nutritious food.

KEY FACTS

ACIAR Project No. SMCN/2014/089
Duration: October 2015 to December 2019 (4 years)
Target areas: Kiribati and Tuvalu
Budget: A$1,030,589

Project Leader
Gison Susumu, The Pacific Community (SPC)

Key partners
- University of Tasmania
- University of Adelaide
- Ministry of Environment, Lands and Agriculture Development, Kiribati
- Department of Agriculture, Ministry of Natural Resources, Energy and Environment, Tuvalu

ACIAR Research Program Manager
Dr James Quilty

Objective

The project aims to improve the livelihoods of the people living in the coral atolls of Kiribati and Tuvalu through increased and diversified agricultural production, including extension approaches and indicators to monitor progress and underpinned by an understanding of biological processes.

The project's specific objectives and activities are to:

- Increase the sustainability and productivity of starchy staple food production systems
- Increase household and community production and consumption of local nutritious foods
- Identify and develop opportunities for inter-island trade in high-value crops and products

Expected scientific results

- Improved food production systems for starchy staples resilient to harsh atoll conditions using integrated pest and soil management.
- Documented information generated by the project on how to organically grow, manage, prepare and preserve nutritious vegetables/fruits in household and school gardens.
- Identification and development of a fresh produce value chain for sale of surplus food production. The mass balance of nutrients will be incorporated into the value chain analyses.

Outcomes

- Cultivars of root crops best suited for some of the outer islands were selected from locally available materials. Sweet potato varieties with local name PNG and PRAP yielded the highest. The taro cultivars all performed well. Both cassava cultivars collected from Banaba and Butaritari can grow well if sufficient compost is applied.
- Applying compost to a trench or planting holes 30 to 40cm deep and planted with root crops or vegetables produced better yields than applying to mounds.
- Pot trials and on-farm trials show that applying 15% compost (1 shovel per planting hole) and 25% compost (2 shovels per planting hole) produce the best results for vegetables and root crops.
- Best bet targeted compost recipes have been developed to produce a balanced source of nutrients for crops. The compost is produced from available biomass for which the nutrient content has been analysed. These composts help overcome the limitations of nutrient poor atoll soils. The compost recipes are being provided to island communities along with training in compost production.
- Nutritious crops like te mota (wild Amaranthus), chaya (Cnidoscolus aconitifolius), drumstick (Moringa oleifera), hedge panax (Polyscias scutellaria), ofega (Pseuderanthemum whartonianum; P. carruthersii), beach cowpea (Vigna marina), kangkong (Ipomoea aquatica, Ipomoea reptans), Cucurbits (pumpkin and choko), bele (Abelmoschos manihot), chilli (Capsicum spp), and purslane (Portulaca oleracea) have been promoted in the food production systems with some success.
- Babai pits as a reserve for a range of foods have been successfully modified in three of the four outer islands in Kiribati.
- Value chain analyses of some crops from Abaiang to South Tarawa had been completed.
- An Abaiang Production Plan and Participatory Guarantee System for Root, Fruit and Vegetable Growers has been developed to guide the value chain component of the project.
- Marketing of produce grown in Abaiang has started in Tarawa.

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