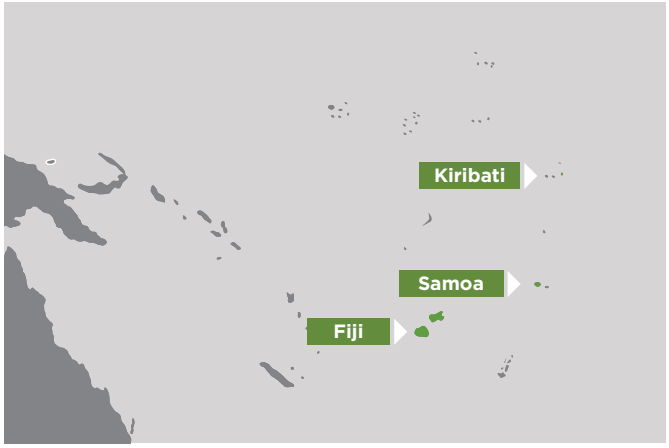
Australian Government
Australian Centre for International Agricultural Research

Fisheries

Diversification of seaweed industries in Pacific island countries



Overview

Seaweed farming is one of the few industries in Pacific island countries that is culturally and technologically appropriate, and able to provide marine-based livelihood benefits to men and women in remote coastal communities.

Seaweeds are produced in relatively small volumes for food and as bioproducts throughout the Pacific and many communities rely on this production for their income. This industry is diverse in the types of seaweeds produced, whether they are cultured or harvested, the way that they are processed and in the final use of the seaweeds. However, this diversity is yet to be translated into sustainable or growing industries, with a range of issues nominated by stakeholders that span technical, cultural and economic aspects. There is a considerable opportunity to modernise and expand the seaweed industry, including the introduction of new products and applications, and this can be done with the support of government, fisheries departments, researchers and the private sector.

This project aimed to conduct a diverse range of research-for-development activities in each of the three partner countries – Fiji, Kiribati and Samoa – relating to seaweed production and bio-product evaluation to diversify the activities and, correspondingly the opportunities available to the seaweed industry in the Pacific islands. The intent was to make the local industry more resilient to both external and internal changes for each partner country.

KEY FACTS

ACIAR Project No. FIS/2010/098
Duration: October 2013 to June 2018 (5 years)
Target areas: Fiji, Kiribati, Samoa
Budget: A$1.2 million

Project Leader
Dr Nicholas Paul, University of the Sunshine Coast

Key partners
- University of South Pacific, Fiji
- Ministry of Fisheries and Forests, Fiji
- Ministry of Agriculture and Fisheries, Samoa
- Ministry of Fisheries and Marine Resources Development, Kiribati

ACIAR Research Program Manager
Dr Ann Fleming

[1] (FIS/2001/085)

Objective

The overall aim was to provide the technological basis for diversification and revitalisation of seaweed industries in Pacific island countries.

Specific objectives were to:

- Improve production levels and post-harvest quality of *Kappaphycus* in Fiji and Kiribati.
- Consolidate production and post-harvest strategies for sea grapes (*Caulerpa*) in Samoa and Fiji.
- Assess opportunities for new seaweed bioproducts in Pacific island countries.

Scientific results

- Biochemical data has been produced for *Kappaphycus* farmed across the Pacific and is the first complete characterisation of product quality for the region. These "product sheets" can be used by stakeholders to aid in their commercial negotiations and to develop alternative products and new applications.
- There has been a substantial change in knowledge relating to the use of the common term "sea grapes". The project's molecular barcoding investigation identified that there are at least four different species of sea grapes in Fiji and Samoa, and only one of these, *Caulerpa racemosa* in Samoa, is readily domesticated for aquaculture.
- In Kiribati, the beach wrack of *Acanthophora* and *Gelidium* (both red seaweeds) and the green seaweed *Ulva* have been biochemically characterised, focusing on their nutrient and mineral contents for compost applications.
- In Samoa, the red seaweed *Halymenia floresii* has been domesticated at the fisheries hatchery at Taloa - a species that was traditionally consumed by villagers.
- Multiple scientific papers were published on new opportunities for seaweed industries and the techno-economic analyses for the diversification of bioproducts.

Outcomes

- Revitalised production of *Kappaphycus* in remote coastal communities of Fiji and Kiribati. In particular, use of *Kappaphycus* for biochar as an agricultural agent and use of *Kappaphycus* in new food and health applications offering new opportunities for export.
- Seaweed (*Caulerpa*) preparations for inclusion in a range of cosmetic products are now a reality for the local company - Essence of Fiji.
- Seaweed cultivation proved an excellent vehicle for the involvement of women and young people, with female entrepreneurs prominent in Samoa for packaging and sales of sea grapes (*limu fuafua*) in the marketplace.
- In Kiribati, women organizations readily engaged with wild harvest and nutritional/cooking programs facilitated by the project team. A peer-to-peer cross-country training exercise was developed that brought Samoan women with expertise in sea grape harvesting and processing to Tarawa in Kiribati to train the women organisations. This provided a unique opportunity for the Samoan trainers to share their knowledge on the international stage.
- Additional training outcomes in Kiribati include community-based production and use of seaweed compost leading to sales of compost and crops by participants.
- Developed a regional database on the production of *Kappaphycus* in Fiji and Kiribati and the seasonality of biochemical traits, along with tailored operating procedures and strategies for the renewed production of *Kappaphycus* with specific end-uses.
- Produced standard operating procedures for village-based production of *Caulerpa*, and product sheets on the nutritional profiles and shelf-life of sea grapes in Samoa and Fiji.

Australian Aid

ACIAR
aciar.gov.au