



Building Micronesian Climate-Proof Food Security through Intergenerational Collaboration and Community Model Farms

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Pacific Island nations are some of the most vulnerable nations on Earth to the negative consequences of global warming. Despite the diplomacy of Pacific nations at global forums on climate change mitigation, commitments made at these forums consistently fall short of the scientific agreed minimum global reduction of anthropogenic carbon emissions needed to avoid irreversible damage to planetary ecosystems. Ocean acidification levels in the Pacific are already more than 100 times greater than the maximum safe limit. Fish such as tuna and corals are sensitive to even one degree of variation in average water temperature, while crop production is extremely sensitive to changes in rainfall and temperature. Food security is a mounting concern in nations where the majority of citizens rely on subsistence farming for sustenance (Vandenbroucke et al. 2015).

In response, many Pacific Island nations are at the forefront of promoting low-emission, cost-effective energy and climate-resilient, healthy and locally grown foods. This In Brief discusses the results of a recently completed Climate Change Adaptation Project on the island of Pohnpei in the Federated States of Micronesia (FSM).¹ The FSM economy is distinguished by US Compact of Free Association funding, a rich tuna fishery dominated by foreign vessels, high migration rates to US territories, and declining traditional farming knowledge among younger generations as a result of wage employment stemming from Compact monies (Puas 2021).

Implementation of the project

By examining traditional food production and management in response to the changing circumstances in the island's land environment due to stresses caused by climate change, the project underscores the importance of traditional food production in the age of climate change and its link to healthy living in Pohnpei (Puas 2023).

The two main purposes of the project were: (1) to promote traditional taro farming at the grassroots level as a climate change adaptation strategy, and (2) to sustain traditional methods of healthy living in the era of climate change. Taro is an excellent, nutritious traditional alternative to less healthy imported foods. Dr Puas undertook an additional study on other varieties of taro that can be rotated throughout the year and harvested in a short period of time, thus providing

a year-round food source. Specific species of taro were selected following a consultative process between Dr Puas and the elders of the community to determine whether certain species can grow both on dry land and in a muddy environment. The taro took around six months to grow before being harvested in mid-2023, and was harvested three times thereafter.

This project builds on Dr Puas's experiences from a similar project — conducted in both his native Mortlock Islands of Chuuk, and Pohnpei — that focused on enmeshing traditional knowledge and research-based findings to develop effective strategies for climate change adaptation. As Director of the Micronesian Institute for Research and Development (MIRAD), Dr Puas also developed an experimental taro farm on his clan land on Pohnpei (and in the Mortlocks) testing the drought, salt water and heat tolerance of a variety of taro known to elders but rarely cultivated in contemporary FSM (Puas 2017, 2019). The New Zealand Ministry of Foreign Affairs and Trade (NZMFAT) funding allowed taro crops to be planted in a greenhouse as an alternative to traditional farming. Greenhouse planting was an experimental undertaking to observe whether these species of taro can withstand heat in enclosures.

The farm is growing well, meeting the following objectives:

- providing knowledge, skills and strategies to all stakeholders (students and community members) about the impact of climate change on food security, health and water conservation
- influencing the development of a climate change curriculum for Pohnpei Catholic High School to be shared with other schools in Pohnpei
- identifying crops (both indigenous and imported) that are adaptable to the island environment by planting them in specific soil conditions
- enmeshing traditional agricultural practices with imported knowledge from the outside world to create a hybrid model for tomorrow.

Many community members, including the President of the FSM, added taro to their diet, and it was well received.

Achievements and reasons for success

Several major lessons have emerged from this successful collaboration between MIRAD, NZMFAT, the FSM Department of Health and Social Affairs, and The Australian National University (ANU). One

lesson is that — while NZMFAT set parameters and required feedback on meeting agreed objectives — the relationship between the partners was characterised by mutual respect, open discussion and flexibility based on varying local circumstances and an understanding that the project was experimental. The inclusion of elders' knowledge of taro strengthened intergenerational bonds with high school age students enthusiastically embracing this traditional knowledge. The model farm has become a centre of learning, where all members of the wider Pohnpei community of around 36,000 people can come to observe, taste, attend workshops and request free samples to plant in their own communities. Kolonia in Pohnpei is also the centre of the national newspaper *Kaselehlle Press* and all government departments, such as project partner the Department of Health and Social Affairs, making it an ideal location for an experiment of this kind.

As a national hub and centre of politics, the location of the model farm in Palikir and second greenhouse in PCHS in downtown Kolonia facilitates national distribution via MPs, as in the case of Senator the Hon Perpetua Konman, Member for Fefan, and via visiting state delegations from elsewhere in FSM.

In addition, the Mortlockese involvement gives the project an immediacy and relevance, because these atoll communities are at the forefront of global warming impacts. The Mortlock Islands are all low-lying atolls. Since 2008, all the islands in the Mortlocks have suffered regular environmental damage from sea surges and salt water inundation. Sea surges in 2017 to 2018 destroyed more than half of the taro farms in the Mortlocks, especially on Lukunor Island, through salt water inundation (Puas 2017, 2023).

This project has expanded the range of taro grown and the amount of locally grown, healthy food in the diet of these communities in just two years. It has done so by tapping into the knowledge of the elders and integrating that knowledge into the school system, and also by providing accessible and rapid evidence and seed. This has been achieved through the model farm for policymakers and growers, and by drawing on the three central pillars of community cooperation: kin, education and church. Tangible, early returns also enhanced community trust in the project. The fruitful co-operation between local organisations and outside agencies to gain rapid community uptake of a variety of crops has wider applicability across the Pacific, given shared food security concerns such as climate change, the disruption of imported food networks, and the

vulnerability to disease of a less diverse crop portfolio (Hunter et al. 1998).

Author notes

Gonzaga Puas is Director of MIRAD; James Golightly was the project liaison officer for NZMFAT, based in its Honolulu Office; and Paul D'Arcy is an Aotearoa New Zealand academic member of MIRAD, specialising in oceanic environmental issues and the history of sustainable development.

Endnote

1. The project is a collaboration between the Micronesian Institute for Research and Development (MIRAD), Pohnpei Catholic High School, the Federated States of Micronesia Department of Health and Social Affairs, NZMFAT, and former ANU professor Paul D'Arcy.

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