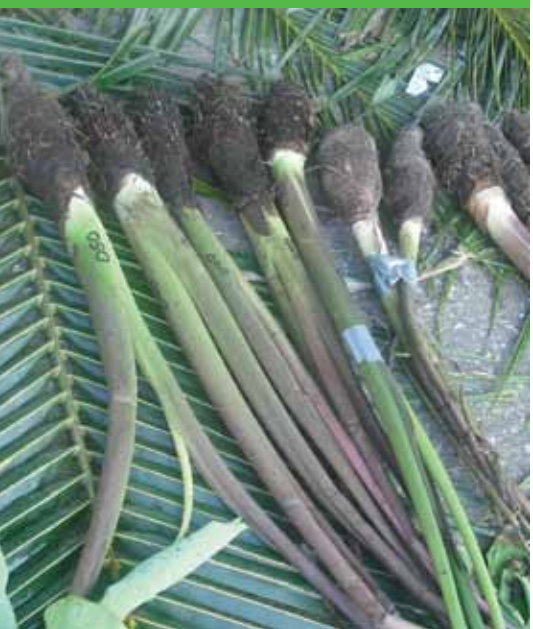
Food security

This document is intended for decision-makers across the Pacific with an interest in community-based resource management and securing food resources against the impacts of climate change.

The Australian Government's **Pacific Adaptation Strategy Assistance Program** (PASAP) helped identify adaptation measures to strengthen the resilience of food systems in the Federated States of Micronesia.



Food security is fundamental to the first goal of the 15 Millennium Development Goals—eradicating extreme poverty and hunger.

Securing food resources in the Federated States of Micronesia

Food security is at the core of sustainable development in the Federated States of Micronesia (FSM). Without constant access to safe and nutritious food, development goals such as eliminating disease, reducing infant mortality and improving education are impossible.

Like most Pacific island nations, changes in population, development, land use and climate are all having an adverse impact on the amount of food that FSM can grow for itself.

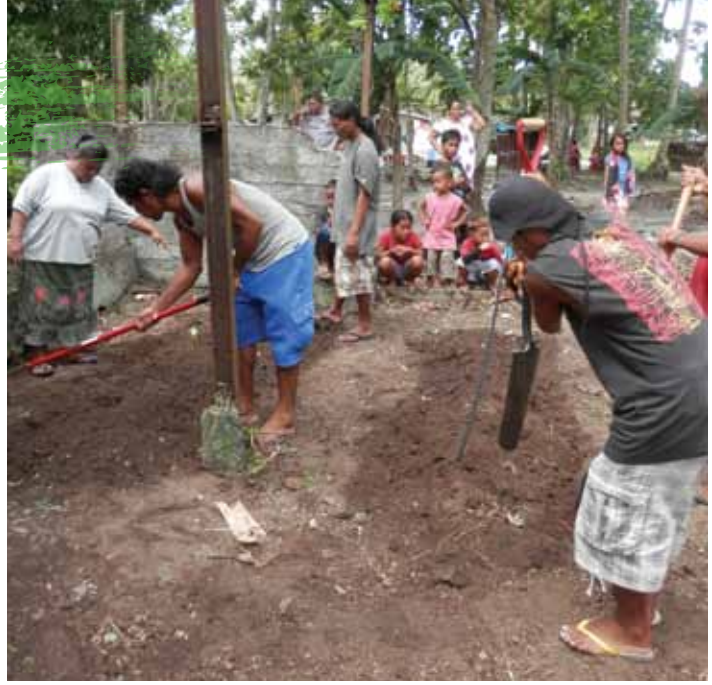
The nation has developed a food-security and climate-change policy for its 111 000 people; however, there is a gap in knowledge about the impact climate change will have on food security.

Australia's Pacific Adaptation Strategy Assistance Program (PASAP) and the Secretariat of the Pacific Community (SPC) are supporting a range of activities in FSM to help secure the nation's food resources against the impacts of climate change.

The activities are particularly aimed at identifying adaptive solutions for agriculture and the community.

Understanding security

Fishing: Coastal fishing is primarily for subsistence purposes with annual catches between 1000 and 5000 tonnes. However, as the population of FSM has increased and become more urbanised, fish stocks in reef areas close to urban centres have been seriously depleted.



Farming: More than 50 per cent of land in FSM is used for subsistence farming. The staple food crops are root vegetables such as taro, sweet potato and yams, and trees such as banana, coconut, breadfruit, mango and citrus.

Securing food resources

There are multiple factors undermining food security in FSM:

» increasing urbanisation
» insufficient investment in agriculture
» higher cost of local foods compared to imported foods
» limited interest of youth in agriculture
» biosecurity issues
» climate change.

Climate projections for the FSM mean:

» higher air temperatures—up to a 1 °C increase on the annual average by 2030
» higher sea-surface temperatures
» higher annual and seasonal mean rainfall
» more frequent and more intense rainfall
» more frequent and more intense hot days
» fewer droughts and tropical cyclones
» continued ocean acidification and sea-level rise.

These changes are affecting the quality and yield of local crops, as well as the FSM's marine food resources.

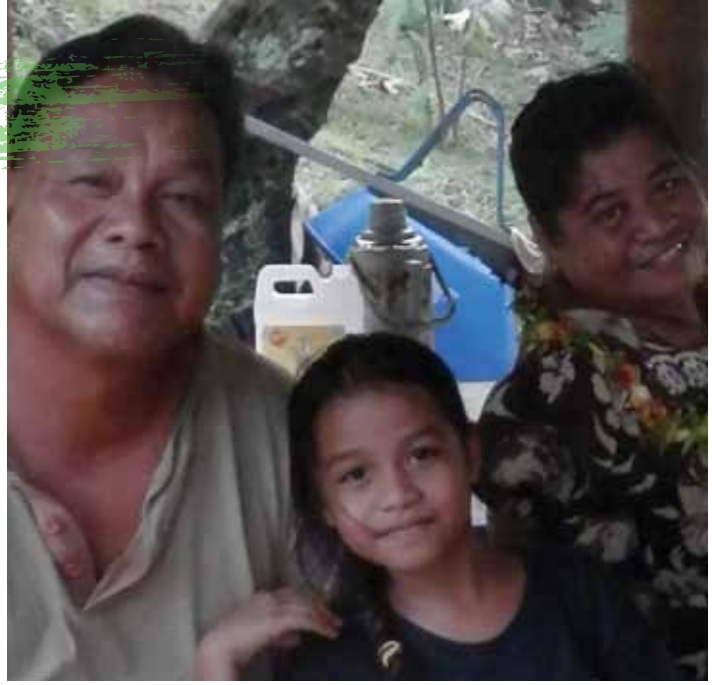
Achieving food security and adapting to climate change requires a multi-faceted approach by local, national and regional bodies.

The two-year PASAP project identified the best performing varieties of drought- and salt-tolerant food crops, and strengthened local communities' capacity to adapt to climate change.

Climate change impacts in each state		Opportunities for adaptation
Kosrae	Sea-level rise and storm surges from extreme weather events are causing erosion and threatening agroforestry systems and groundwater supplies.	People's concern about sea-level rise and storm surge may result in willingness to plant trees for coastal protection. Rising costs of imported food may also mean people turn to traditional food production.
Pohnpei	Sea-level rise and storm surges have damaged or destroyed taro production areas in low-lying areas and wetlands.	Kava (Sakau) production within Pohnpei's home gardens is ecologically sustainable compared to systems in more mountainous areas.
Yap	Salt water intrusion has damaged or destroyed taro production in low-lying areas of mainland Yap and most taro patches in outer islands.	The migration of outer-island people to mainland Yap increases the need for more local food as well as a potential labour force to expand food production systems.
Chuuk	Taro patches on Chuuk's atoll islands are especially vulnerable to sea-level rise, storm surges and salt water intrusion.	The cost of imported food is increasing, so people may need to turn to traditional food production. The migration of outer-island people to mainland Chuuk increases the need for more local food as well as a potential labour force to expand food production systems.

Building capacity

Adapting: Researchers work with local farmers to grow and assess the resilience of eight local drought-tolerant varieties of sweet potato and two local varieties of salt-tolerant taro. Farmers are encouraged to distribute these varieties to other families in their community.



Sharing: Simon Casiano (*left*), a farmer working with PASAP researchers in Chuuk, says he has given sweet potato and taro cuttings to more than 80 people in his community. He says locals are interested in the project and understand the importance of these crops.

Agriculture- and community-based activities in the project included:

- identifying varieties of drought-tolerant sweet potato and salt-tolerant taro
- educating communities about how to identify drought- and salt-tolerant crop varieties
- teaching agricultural methods that help communities manage and adapt to their changing environment, encouraging a return to locally grown produce
- increasing awareness and knowledge about climate change impacts on food security.

Communities already replant coconut groves along the coastline to protect arable land from erosion and to protect crops from salt spray and high tides. They also build seawalls to help protect land and fresh water resources from salt water intrusion during high tides.

Identifying climate-resilient foods

The PASAP project worked with local communities across the four states of FSM to assess the resilience of different varieties of the nation's significant food crops—sweet potato and taro.

Two field trials were set up in each state in areas with different ecological conditions:

- Kosrae: Tanfunsak (coastal) and Lelu (inland)
- Pohnpei: Kitii (inland) and Madolehneim (mangrove)
- Chuuk: Tunnuck (coastal and upland)
- Yap: Dinay (inland) and Wugeem (inland).

Eight varieties of sweet potato and two varieties of taro were planted in each location to identify which one was better suited to the local conditions.

The process for identifying the best performing varieties included:

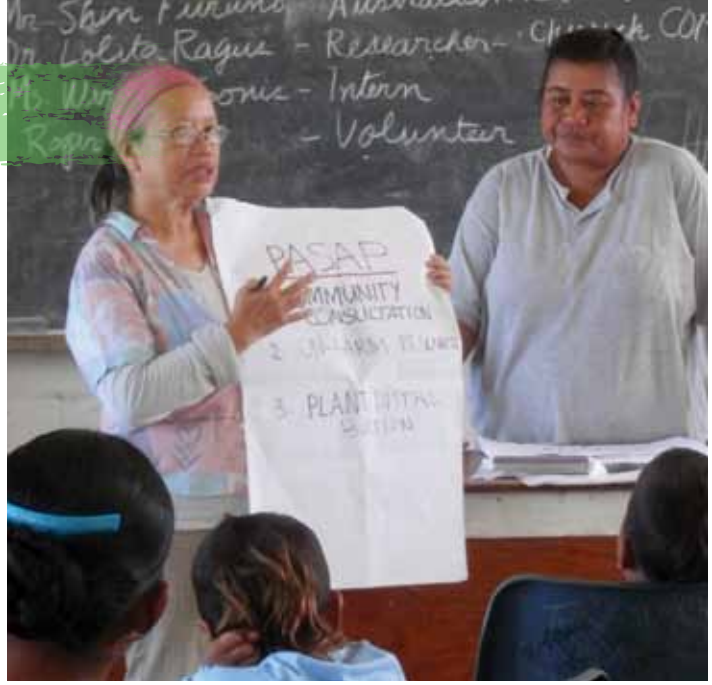
- land preparation
- planting
- growing
- harvesting
- taste-testing.

The recommended variety from each field trial was based on an analysis of plant growth, crop yield and taste-testing. Tissue cultures from the best performing varieties are cultivated for future use.

Performing: The best performing sweet potato varieties were IB/US/16 (*top 8*), IB/PR/07 (*top 4*), and IB/PR/12 (*bottom 6*). The best performing variety of taro was Kosraean Red.

Involving everyone

Participating: Women and men were able to provide different insights into local food crops and adaptive measures. For example, elderly men were able to identify salt-tolerant varieties of giant swamp taro. Women who have relocated to other islands have insight from their home islands.



Teaching: Dr Lolita Ragus, agronomist at the College of Micronesia, visits communities where crop research is being conducted to explain the research and best practices that will help the community improve their crops.

Next steps

In line with FSM's national food-security policy, national and state governments are considering the best options for securing national food resources through working with researchers, NGOs and the community to:

- integrate climate change risk considerations into coastal management policies
- include community-based adaptation activities in land-use policies
- conduct further research into the impacts of climate change on food systems
- include atoll and rural communities in climate-action projects
- protect agroforestry and mangrove areas
- develop climate-change and food-security awareness and education campaigns
- collate and update geographic data to allow for better informed environmental and developmental management decisions.

What defines food security?

The concept of food security is commonly defined as people having physical and economic access to sufficient, safe and nutritious food that meets their dietary needs as well as their preferences.

The Food and Agriculture Organization of the United Nations has defined four pillars for food security:

Availability is the amount, type and quality of food that is available for consumption. This pillar also means food can be produced, distributed and exchanged.

Accessibility is the ability to access the type, quality and quantity of food required. This pillar also means people can afford and allocate food, and have preferences.

Usability is the capacity to consume and benefit from food. This pillar also means food has nutritional and social value, and is safe to consume.

Stability is the resilience of availability and accessibility when there are changes in circumstances.

Photography: DIICCSRTE

More information

The Australian Government funded research into climate change and the resilience of food resource systems in the Federated States of Micronesia. The research was part of Australia's **Pacific Adaptation Strategy Assistance Program** (PASAP).

For further information on food security in the Federated States of Micronesia or other PASAP projects, go to www.tiny.cc/t5axxw or contact InternationalAdaptation@climatechange.gov.au

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