



Food and Agriculture
Organization of the
United Nations



International
Plant Protection
Convention



Department
for Environment
Food & Rural Affairs

Climate Change and the Impacts on Plant Health.

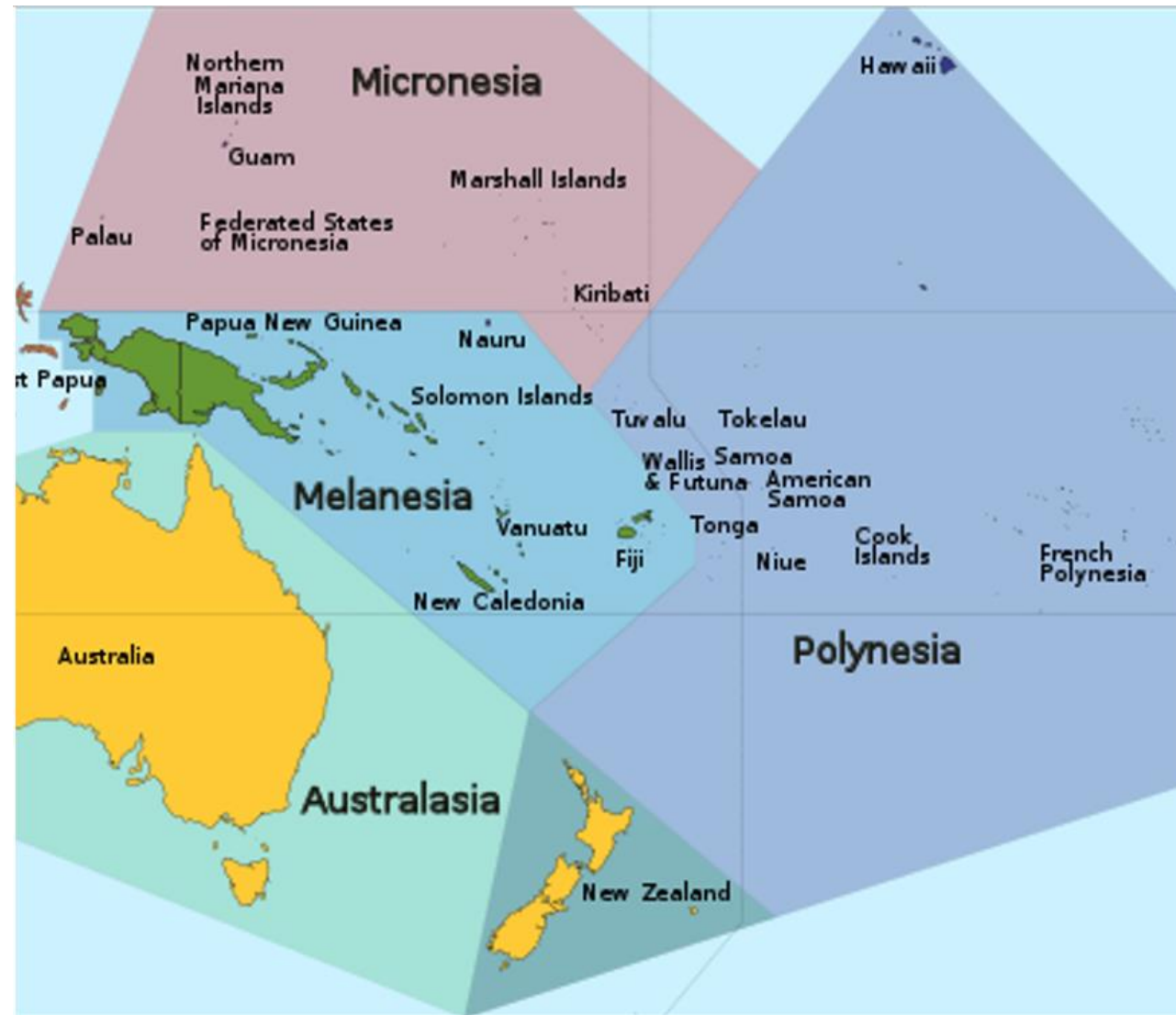
Case study in the Pacific Region.

Pacific Plant Protection Organisation (PPPO)

IPPC FG CPPI Webinar 1- 24 September 2024

PACIFIC PLANT PROTECTION ORGANISATION REGION (PPPO)

- Southwest Pacific comprises of 22 Pacific Island countries and territories scattered over 40 million sq kms ocean.
- Populations range from 1400 – Tokelau to 25 million plus - Australia.
- Areas range from 10 sq km (Tokelau) to 7.7 million sq km Australia.
- Over 50 languages + 200 dialects.
- Grouped 3 sub regions - Melanesia, Micronesia, Polynesia regions



Climate Change in the PPPO region



- El nino – Prolonged droughts
- Heavy Rainfall – Floods



Impacts



- Stressed plants
- Major Pest outbreaks – due to reduced population/absence of natural enemies
- Huge decline in agricultural production
- Huge decline in fresh produce exports

Effects of rainfall change on crop production

In FIJI the 1 in a 50 year flood in 2009 affected

- **70% of pawpaw orchards**
- **dalo and cassava plantations in the low-lying area of Naitasiri and Rewa**
- **80% of vegetables and pulses that immediately required re-planting**

Source – SPC 2016

Example of a disrupted ecology in Fiji

- “2016 Fiji Ant-Mealybug Bioinvasion” (Thaman 2018)
- Not likely a new invasion (too widespread over a sudden time period)
- Likely driven by extreme weather event, Cyclone Winston
- Cyclone caused biological control insects to decline → “Enemy release” enabled sap-sucking insect outbreak → More resources led to outbreak of white-footed ants



White-footed ants. Image
©Mario David Bazan, CCL

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- Outbreak of more than 20 sap-sucking insect species
- Affected 292 plant species including crops, ornamentals and native plants
- Likely to see more examples like this due to climate change with more extreme adverse weather events



Taro leaf blight in Papua New Guinea (PNG)

- Taro leaf blight caused by *Phytophthora colocasiae* was introduced in PNG during the 2nd World War on Bougainville in the 1940s.
- It spread to the mainland PNG in early 1979 It then spread to other parts of the coastal areas of the country.
- The disease has not been recorded in the central highlands region with cool, temperate-like weather conditions.
- The first record of TLB in the highlands was on wild taro at Kuk Agricultural Research Station in Western Highlands Province in 1986.
- The spread of TLB and the increased in commercial taro cultivation in the highlands region since the mid-1990s is attributed to change of climate in the highlands of PNG.



A taro leaf plant severely infected by TLB fungus and severe shot-hole symptoms.


Banana Associated Wilt Phytoplasma in PNG

- Banana Wilt Associated Phytoplasma (BWAP) is a phytoplasma disease. It was first observed on Buka Island of Bougainville in 2006.
- In 2009 field samples were collected from banana pseudo stem tissues in Madang Province.
- The disease mainly affects a particular the local cooking banana variety of the ABB genome.
- Initially, the disease was confined to hot and humid weather conditions in the coastal provinces of PNG.
- The disease in recent years seem to have spread into areas bordering the coastal and highland provinces most likely due to the impact of climate change.



Disease causes yellowing and browning of leaves and eventually the whole plant dies. Affected plants do not bear normal size fruits.

How is climate change affecting Nauru?

- Sea-level rising – With only one island for the 11,000 occupants we have seen the many residential areas on the fringe of the island been affect. Houses are torn apart due to the water intrusion
 - Sea-level rising also affects the water security of people, especially those living at the low-lying areas, saltwater intrusion has caused problems with drinking water
 - Ocean acidification also affects the food security of the people of Nauru, where most people rely heavily on the ocean for food. With the warming of the ocean causing less fish and coral bleaching the Nauruan people have reduced access to food
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Saltwater intrusion

- Although the Pacific Islands have done little to contribute to global warming, they are facing some of the most dire consequences of rising seas.
- Intrusion of seawater threatens biodiversity along with crop yields



Top photo – Pandanus trees affected by sea water in Kiribati
Bottom photo's – Taro farm affected by sea water in Chuuk, FSM

Prolong wet seasons

- Prolonged wet seasons contributes to the spread of black pods in Cacao.
- Black pod is caused by a an oomycete (Phytophthora) that spreads rapidly on the pods under conditions of excessive rain and humidity, insufficient sunshine, and temperatures below 21 °C.
- *Phytophthora* spp. are responsible for pod loss of 20 to 30% of the total cacao crop annually, in Fiji.



Global warming

- Increased temperatures have impact on a crop's optimal growth period. While some crops may show increased yields, most food crops will experience negative effects on the amount and quality of yields.
- In Tuvalu, a breadfruit variety is fruiting almost year around compared to the usual seasonal fruiting, thus ensuring the continuous supply of food that is high in complex carbohydrates, low in fat, and cholesterol and gluten free.



Some impacts of Climate change on crops in the Pacific


On atolls

- More frequent extreme weather events → tidal waves, seawater inundation and rising water table → direct crop loss, soil salination, reduced agricultural land, loss of freshwater reserves

On high islands

- More frequent extreme weather events → direct crop damage, landslides lead to soil erosion, reduced agricultural land, leaching and tree cover loss increasing susceptibility to weeds

All islands

- Increased habitat for pest insects, ecological changes causing pest outbreaks
 - More frequent droughts
 - Sea level rise
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Climate Change

Along with the Pacific region, Australia is on the front line of climate change impacts.

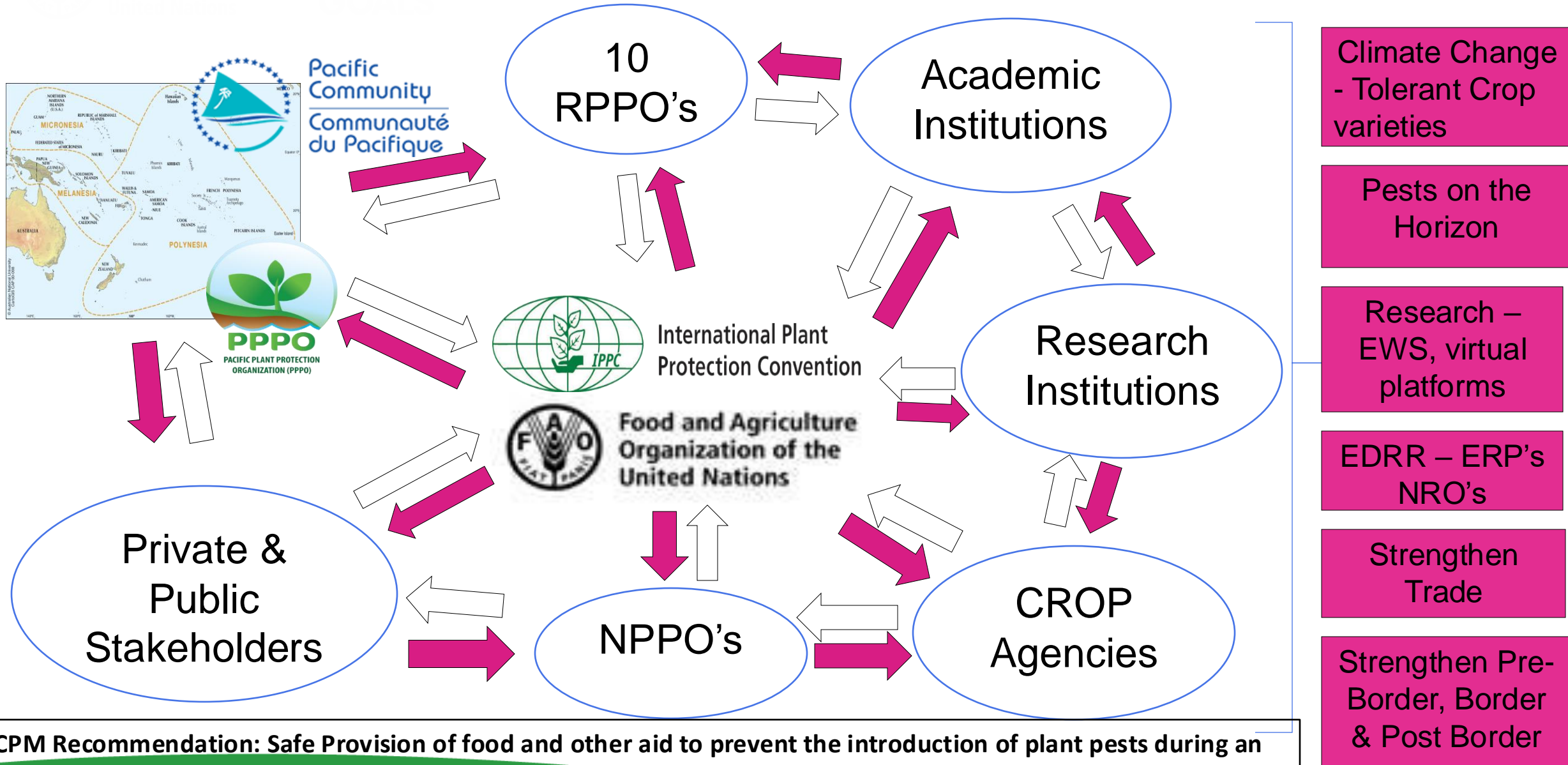
Through the NPPO (Australian Government Department of Agriculture, Fisheries and Forestry - DAFF), Australia is working to use science and innovation to support climate change preparedness and recovery.

The department has a number of initiatives such as;

- **Agriculture Biodiversity Stewardship program**
- **National Landcare and regional Land Partnerships programs**



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SAFE FOOD AID – FACT SHEETS



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SENDING SAFE AID WITHOUT HARMFUL PESTS AND DISEASES

FACTSHEET
01

For agencies and development partners sending live plants: nursery stock, propagative or other planting material

Please help us to safeguard our vulnerable environment and communities by ensuring that any humanitarian aid that is sent does not inadvertently introduce harmful pests and diseases



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SENDING SAFE AID WITHOUT HARMFUL PESTS AND DISEASES

FACTSHEET
03

For agencies and development partners sending fresh produce and other food items

Please help us to safeguard our vulnerable environment and communities by ensuring that any humanitarian aid that is sent does not inadvertently introduce harmful pests and diseases



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SENDING SAFE AID WITHOUT HARMFUL PESTS AND DISEASES

FACTSHEET
05

For agencies and development partners sending new and used building materials

Please help us to safeguard our vulnerable environment and communities by ensuring that any humanitarian aid that is sent does not inadvertently introduce harmful pests and diseases



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FACTSHEET
02

For agencies and development partners sending seeds for planting

Please help us to safeguard our vulnerable environment and communities by ensuring that any humanitarian aid that is sent does not inadvertently introduce harmful pests and diseases



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FACTSHEET
04

For agencies and development partners sending meat and animal products

Please help us to safeguard our vulnerable environment and communities by ensuring that any humanitarian aid that is sent does not inadvertently introduce harmful pests and diseases



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FACTSHEET
06

For agencies and development partners sending new and used vehicles, machinery and equipment (VME)

Please help us to safeguard our vulnerable environment and communities by ensuring that any humanitarian aid that is sent does not inadvertently introduce harmful pests and diseases



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THANK YOU



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