Pacific food security under climate change

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Focus of the presentation:

Island based food systems - rather than Atolls
Land-based food systems – excluding fisheries
Emphasis on adverse weather events

Outline of presentation:

(1) Production – Markets – consumer
(2) Adverse weather events
(3) Their they interact.
Throughout the Pacific, demand for food is increasingly being serviced by imports. Rice and wheat are now part of Pacific Islander’s daily diet. This is a critical situation in terms of food security and nutritional security, given the volatility of international commodity prices. (FAO 2008)

Food insecurity and inadequate nutrition are key issues which threaten lives and well-being in Pacific Island countries, and changes in climate are likely to exacerbate existing vulnerabilities (UN Women 2015)

Profound changes are needed to Pacific Island food systems to deal with the threat of climate change and more resilient food systems will have to be created (SPC 2016)
Food security versus nutritional security

- For most of the time and in most Pacific Islands, it's more about nutritional security rather than food security.

- Food security becomes a problem during periods of external shocks (normally weather-based) when local food supply chains rapidly breakdown.

- Local food production systems are often highly fragile but relatively resilient.

- This resilience, however, is dependent on frequency and predictability of external weather events.
Food Production Systems in the Pacific

• Declining farming participation
• Land access challenges
  • limited arable land
  • customary land access
  • Short term 3-5 years land leases
• Trends towards urbanisation
  • Declining access to labor
• Poly-cultural production systems transiting to mono-cultural farming
• Declining or challenged soil fertility due to past production practices
• Reliance on rain-fed production & limited ground water
• Resource-limited technical support agencies
Food supply systems in the Pacific

• Commercial food production systems are often geographically concentrated
• Few food transport options
• Transport logistics often dependent on critical infrastructure.
• Semi-centralised marketing around a network of municipal markets
• Limited inter-island fresh food supply chains
• Limited cool chain management capacity from farm to market
• Current food losses 12-20 %
• Locally produced food often more expensive than imported product
If the Savaii to Upolu ferry is disrupted then the vast majority of the domestic citrus supply on Upolu (supporting 135,000 people) is removed. As citrus is a counter-seasonal fruit crop, this has wider food supply implications.
Supply route easily disrupted.

Most of the vegetable crops on the island of Viti Levu, in Fiji are sourced from the Sigatoka valley.

There are only three roads into the valley – all of which highly vulnerable to frequent severe flooding.
Retail outlets and markets supplying fresh fruit and vegetables - Samoa

- Supermarkets where fresh fruit and vegetables sold
- Municipal and private fruit and vegetable markets
Human element

- Strong dietary preferences
  - Low intake of vegetables
  - Limited diversity of food crops consumed.
- Trends towards urbanisation
  - Reduced food self dependence
- Heavy reliance on public transport to access food markets
- Increasing remittance dependence in some Islands
### Pacific horticulture food systems in the context of climate change

#### Risk factors - Fragile

1. Localized & centralised production (time and place)
2. Few food outlets and limited distribution networks
3. Increased reliance of commercial food sources
4. Limited food transport modes – often easily impaired
5. Low horticultural crops diversity
6. Low productivity
7. Declining farm participation
8. Limited central storage capacity (3 days food supply)
9. Low self recovery capacity

#### Resilient factors

1. Significant subsistence farming – alternative food
2. Short transport distances
3. Dominance of low impact crops (root crops, vegetables)
4. Secondary production locations – alternative food supply
5. Low input farming systems – limited infrastructure damage
6. Seasonal farming limiting production during high risk periods
South Pacific (since 2010)

**Hurricanes**
- 19 severe tropical cyclones (STC)
- 118 deaths due to STC
- >US$1.5 Billion in damage
- Of which US$1.2 Billion of damage in last two years (Cyclone Pam and Winston)

**Flooding**
- 113 tropical depressions leading to localized flooding
  - Flooding in Fiji (April 2016) kills 3 people
  - Flash flooding in Solomon Islands in 2014 kills 22 people and displaces 50,000.

**Drought**
- PNG Highland drought (July 2016) has 125,000 on emergency food aid.
Then there is the NCD-health crisis in the Pacific

Case example One

2014 Honiara flooding
(Solomon Islands)
Overview

- April 2014 – flash flooding in Honiara, Guadalcanal, Isabel, Malaita, and Makira-Ulawa due to Cyclone Ita
- 500mm concentrated rainfall in 24 hrs
- Total damage bill US$107.8M or (9.2%GDP)
- 22 fatalities
- 10,000 displaced individuals
- 7335 households directly affected
  - 89% of urban and 96% rural population grow their own food.
Most of the commercial horticulture production from the Guadalcanal delta destroyed

E-W Road network into Honiara destroyed

Road access within Honiara limited due to destruction of one of the main access bridge

Population displacement

Horticultural product alternatively sourced from secondary outer Islands
  • Increased boat and ferry supply routes
  • Increased losses due to prolong transport

Transport costs go up.
  • local community road use fees
  • Reduce farmer access to trucks
  • Greater reliance on small local buses

Greater portion traditional commodities sold on market

Seed supply constraints impair recovery

Increased vendor participation municipal market
Commercial food sources and supply routes pre-flooding
Post-flooding, the food systems are now hyper-sensitive to a potential second shock

- Reliance on inter-island food supply chains
- Reliance on secondary more subsistence food
- Market and food supply chain now concentrated on few crops
Localised population displacement
• 24 emergency centres established
• Domestic food supplies run short – red cross emergency food aid
• Increasing civil unrest leading to riots in Honiara
  • Concerns over perceived Government corruption, flow-on impacts of displaced population, food access re-ignite local ethnicity and inter-island tensions
• Riots cause sporadic closure of town centre and food markets
• Dengue fever outbreak
• Tensions further raised with 6.0 Mw earthquake off Makira island a few days after flood water receded.
Adverse climatic events have dramatic impacts on food systems in the Pacific – exposing underlying food security challenges.

But as was the case in Solomon Islands, they can also trigger a sequence of complex events that can lead to riots, re-emergence of ethnic tension, and public insecurity.
Case example Two

2016 Cyclone Winston (Fiji)
Overview

- Feb 2016 – Cat 5 Severe Tropical Cyclone
- Total damage bill US$1.4B
- 44 fatalities
- 40,000 homes damaged or destroyed
- 62,000 relocated to emergency accommodation
- 350,000 people adversely impacted (40% total population.)
Where most of the food security impacts occurred
Where most of the food security impacts occurred

- Greatest impact on remote islands where there was a reliance on subsistence farming
- 90-100% crop failure in affected areas
Rakiraki municipal markets, North Viti Levu
June 2016
Physical impacts

- Major loss of food supply infrastructure
- Major crop losses
- Flow-on impact on food supply chains around the whole island
- Greatest impact on remote small island populations

However, major commercial production centres on the southern side of the Viti Levu escaped relatively undamaged.
Supply chain impacts

- In-market postharvest loss reduced (8.2% to 2.5%)
- Vendors stockpiling due to difficulty in sourcing product
- Product held longer in markets (high ambient conditions) to recover higher purchase price – nutrition implications
- Consumer prepared to buy poor quality product
- Change in commodities sold – Govt. cessation of exports to re-direct product thru domestic market (ginger)
- Perceived higher pesticide usage - crop more valuable.
- Increased number of farmers direct selling in the markets
- Gender participation in market changes in favour of males
- Vendor to vendor purchasing cycle
- Elevated ethnicity impacts on supply chain
- Product moving between markets (South to North)
Increased frequency and intensity of adverse weather events, coupled with other environment changes will obviously have a major impact on Food security in the Pacific.

How this impact plays out is likely to highly complex (and somewhat unpredictable)

- Further elevate NCD’s especially amongst Polynesia cohorts
- Strengthen donor-aid dependence
- Civil unrest and ethic tensions

(In my opinion - Food security is going to get a lot worse before it gets better).