



Food production and water management in atolls and low-lying Pacific Islands

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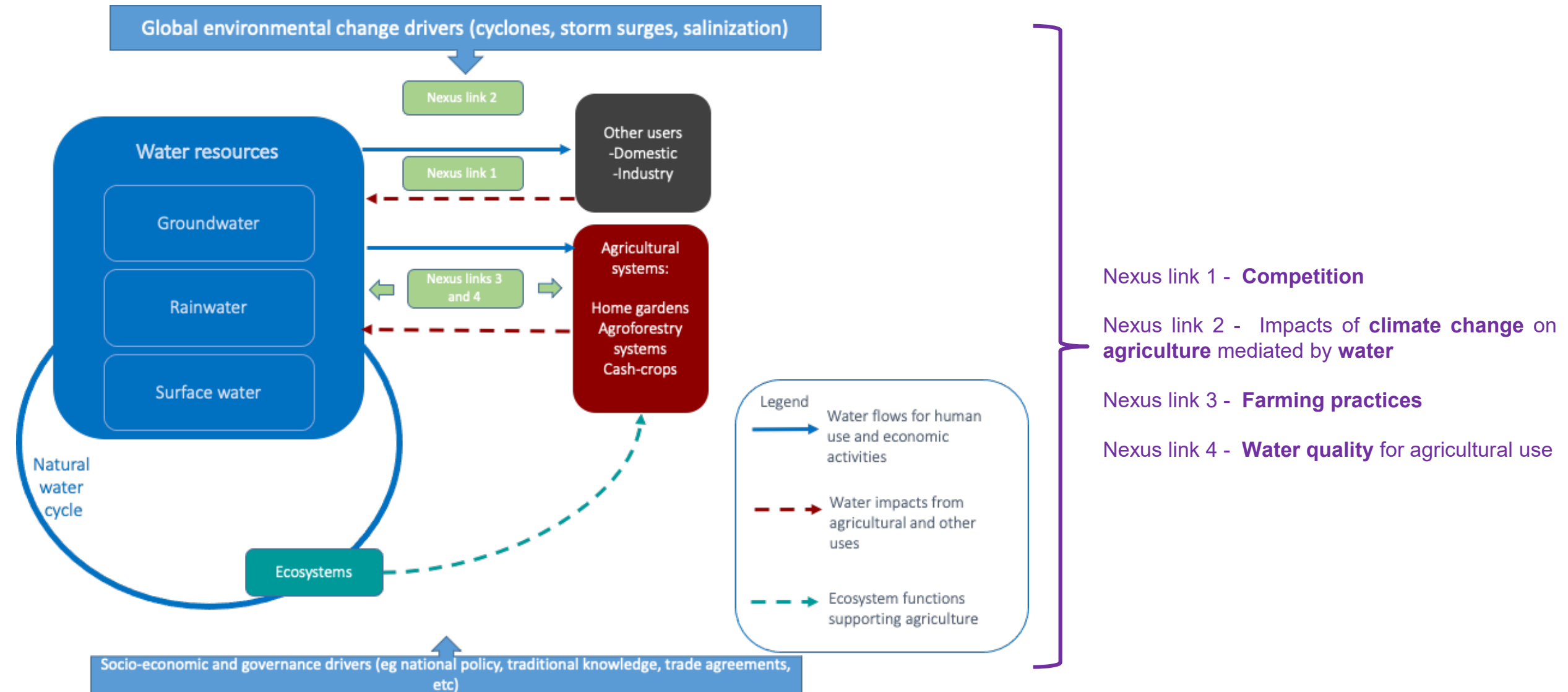
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Pacific Islands water-food nexus context

- **Water and food security risks** likely to increase worldwide due to population pressures and climate shocks
- The Pacific region is no exception – highly exposed and remote region.
- ‘Nexus thinking’ between sectors prevalent since 2000s, but very SE Asia focused work
- **Limited research** appears to have been conducted on water-food interactions in the Pacific region – but substantial work in individual sectors (SPC, Falkland and White, GeoScience Australia, ACIAR)
- Water (WASH + water resources) & agriculture attract aid investments. Agriculture receives **10 times** as much investment as water in the Pacific.



Water for food nexus framework





Unique freshwater context in atolls

- Natural freshwater resources on atolls are limited to a shallow groundwater lens and/or rainwater
- The freshwater lens floats directly on top of seawater underground
- The lens tends to be thicker in the middle of the island, but deeper underground
- The freshwater lens is susceptible to contamination



Water-climate implications

Sea-level rise

- Causes saline intrusion in coastal wells
- Raises the likelihood of overtopping
- Pushes the freshwater lens higher
- Creates erosion that can damage infrastructure
- Displaces people who consequently may have to use different water sources

Changes in rainfall

- More extreme rainfall raises likelihood of contamination
- Rainwater storage and groundwater is sensitive to an increase in dry spells (but these are uncertain)
- Higher temperatures increases evapotranspiration which offsets increases in rainfall or amplifies effects of decreases

Changes in cyclone activity

- Fewer cyclones, but with greater intensity, makes wind damage less frequent but greater in magnitude when it does occur





Water sources and uses

| Water source | Uses | Challenges |
|---|--|--|
| Privately owned electric or hand pumps, and wells | Domestic purposes; Sometimes drinking; Feeding livestock | Easily contaminated by surface runoff and sanitation pollution; Upconing if overused |
| Rainwater harvesting | Primarily drinking; Sometimes domestic purposes | Difficult to store large volumes; Sensitive to dry spells; Animal faeces |
| Piped schemes | Domestic, commercial, productive purposes | Only available on wide atolls; Drawdown if overused |
| Desalination | Sometimes all purposes (Ebeye island); Emergencies (Funafuti); Drinking water only for small-scale units | Expensive upfront costs and maintenance; Supply chain issues; Disposal of brine |
| Packaged water | Drinking | Expensive; Creates plastic waste |
| Traditional methods | Emergencies | Obtains small amounts of water |





Atoll agri-food system

Consumer Behavioural

- Preference for processed and imported foods



Taste (salty, fatty, sweet)



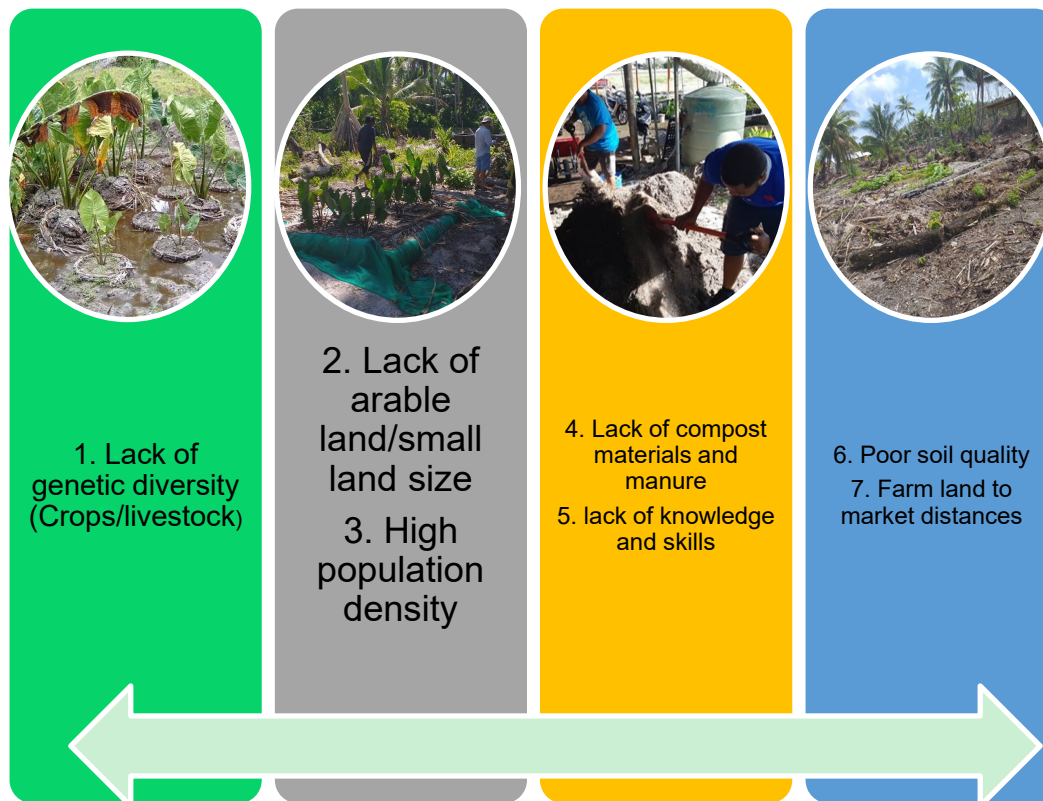
Quick and easy to prepare (rice)



Desirable/Trendy (modern)

- *On-ground local movements to revive passion and enthusiasm for local foods*

Agricultural constraints



Environmental



Governing water-food nexus in atolls

- Modern-day governance of PICTs is facilitated through a blend of nation statehood (or dependent territories of a nation state) and “traditional” systems that have varying levels of power and legal recognition across the region (Hassall et al, 2011).
- Atoll countries have different governance systems – eg Kiribati has Drought Management Plans for each island
- Context specific management (island) may not align with national level policy/strategies
- Villages and communities hold strong ‘ownership’ of traditional knowledge and ways of negotiating resource access.
- SPC and other partners increasingly working towards blended knowledge approaches to community resource governance



Focus Area: Focus Area 3: Productive water in agriculture and the economy

Session Title: Water-energy-food nexus

Schedule: 9 August 2022 (Tue), 3:00 p.m. - 4:30 p.m. (GMT+08)

