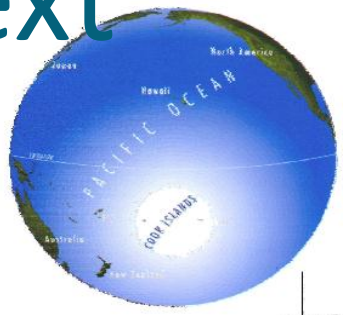
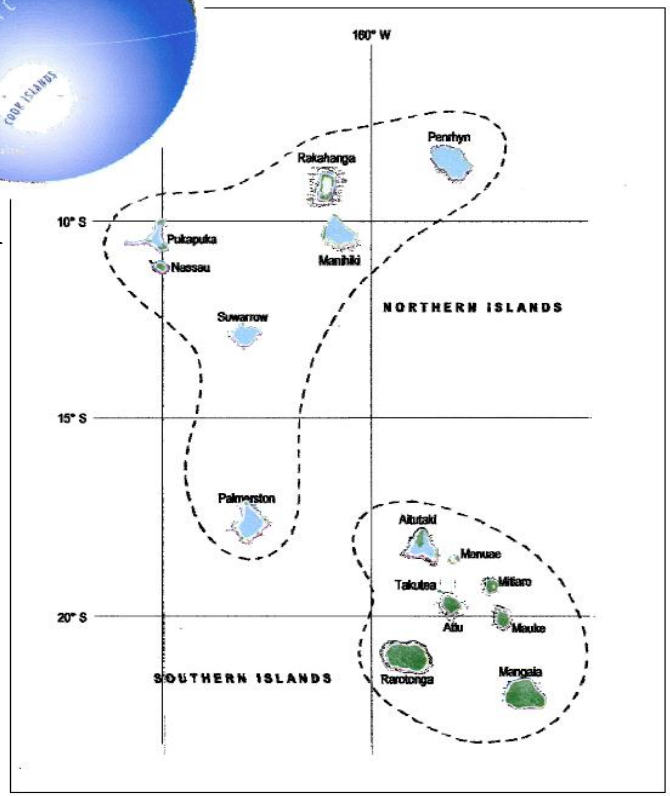
TANKS AND TABLES – Cook Islands water security through science and technology measures

The 3rd Workshop on South-South Cooperation on Science and Technology to Address Climate Change and Technical Training
23 – 25 October 2013, Nanjing,China

Cook Islands Context

- 15 small islands
- 200 square kilometres land
- 200 million square kilometres ocean
- 15,000 total resident population
- Medium income country
- Tourism led economy
- Carbon emissions negligible
- 69.574 t Co2e
- Migration, smallness, isolation





Climate

- Maritime tropical dominated by easterly trade winds.
- Dry season from May to October (average rainfall 666mm)
- Wet season from November to April (average rainfall 1333mm).
- The wet season associated with tropical cyclone season
- The average temperatures range between 21 and 28 degrees Celsius.
- Average temperatures increased by 0.6-1.0 degree Celsius since 1910 and are projected to increase by 0.99-3.11 degrees Celsius by the end of the 21st century.
- Sea levels have risen by approximately 1.6 mm per year over the last 50 years and are projected to rise by 0.19-0.58 meters by the end of the century.
- Rainfall patterns have changed and the frequency of extreme events including flooding, droughts and storm surges has increased.
- Increase in intensity and frequency of extreme climate events - cyclones

Impacts on human and natural systems

- Extensive coastal erosion, coral bleaching, increased distribution and frequency of mosquito-borne diseases, decreased productivity in agriculture, devastating droughts affecting food supply and serious water shortages, and damage to coastal infrastructure
- Sea level rise threatens low-lying islands and coastal communities which includes the majority of tourist accommodation and restaurant facilities and other economic activities in Rarotonga and Aitutaki.

National Policy & Planning Framework

National Sustainable Development Plan 2011 -2015

Priorities, Strategies and actions

Medium Term Budget Framework

national and external appropriations

Climate & Disaster Compatible Development Policy 2013 - 2016

Low carbon development

Climate & Disaster resilient development

Strengthened Enabling Environment

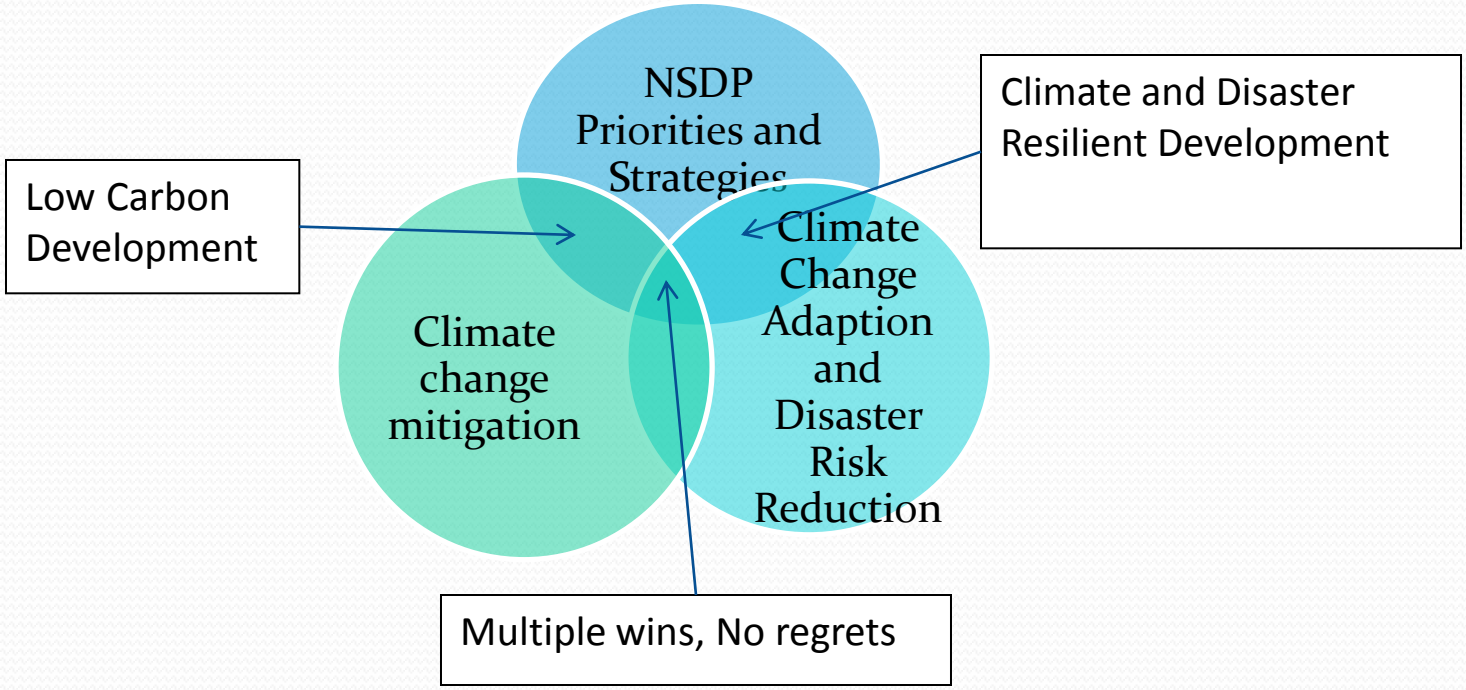
DRM & CCA JNAP 2012-16

CC mitigation, adaptation and Disaster Risk Reduction

Related Policy instruments

eg: Renewable Energy Chart, NESAF, Health Strategy, Building Code, Destination Development Strategy, Road Transport Policy, Island Strategic Plans

Integrated Policy Approach



Water Security Issues

- Issues related to fresh water harvesting, storage, distribution and quality
- Varied approach depending on island – low lying atoll vs volcanic mountain islands
  - Sustainability of the technology
    - Durability of the equipment,
    - costs of and access to parts and materials
    - maintenance schedules.
    - Skills and training to service equipment
  - Ground water tables/lens
    - Saltwater intrusion
  - Monitoring rainfall, water table and water quality
  - Early warning systems
  - Consumer conservation patterns
  - Education and awareness

Interventions

- Northern Group – Rain water
  - Households and community water tanks
  - First flush devises
  - Water tank construction – durability of materials – concrete versus plastic, above ground versus below ground storage
- Southern Group – Ground water reticulation
  - Photo voltaic Solar powered pumps,
  - Improved water monitoring

Priorities and Support

- Promote use of tried and true technology along with traditional knowledge and practices
- Development partner support and programmes eg:
  - UNDP – Adaptation Fund
    - Strengthening the Resilience of our islands and our communities to Climate Change (SRIC)
  - NZ – Bilateral funds for RE
  - EU – Regional funds GCCA
  - China – Rarotonga Water Reticulation Project – Te Mato Vai

Rakahanga

- 141 - 64% female
- 32 dwellings
- Land: 4.1 sq km Lagoon: 13 sq km
- Water - 26 households have their own rainwater tanks and 6 households rely on four public water catchments. 8 have to cart water to the home
- Water management includes increasing community and domestic water tanks.

RAKAHANGA

Water hole contamination with salt water intrusion

Atiu – Water Security

- Population: 570 - 51% Female
- 161 Dwellings
- Land 26.9km²
- Use 17% suitable for annual and tree crops (banana, mango and coconut)
- Additional 51% suitable for other tree crops (oranges, noni)
- Majority of households involved in fishing
- Water household tanks are supplemented by tankers filled at public reservoirs or natural wells;
- maintenance of roofs, gutters and tanks for clean rainwater storage tends to be neglected;
- all households on Atiu have 6000 or 5500 litre plastic water tanks which were installed in 2004 and 2005;
- two serious drought periods. Pumping water from underground caves

Water Management Plan

- increased rainwater harvesting,
- Increased storage capacity of community and households
- use of rust resistent and solar water pumps used for distribution between community tanks and households.
- Use of brackish/seawater and greywater.
- Improved monitoring devices of water galleries and community tanks

ATIU

Ground water pumped to storage tanks

Gravity feed for distribution

Concluding Comments

Capacity an ongoing issue

- Suitable use and application of technology
- Human capacity

- Contact
  - tina@akairoconsulting.com robert.matapo@cookislands.gov.ck
  - Ana.tiraa@cookislands.gov.ck
- www.pmoffice.gov.ck

- Meitaki Maata e kia manuia – Xie xie ni