Asia Water Forum 2022
8–11 August 2022 • Online

Focus Area 2: Universal Water and Sanitation Services

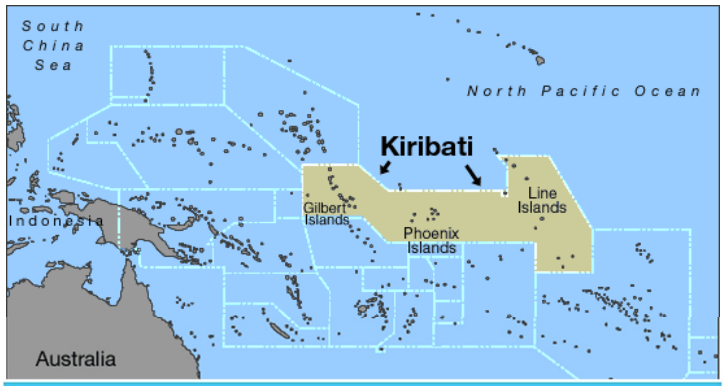
Session Title:

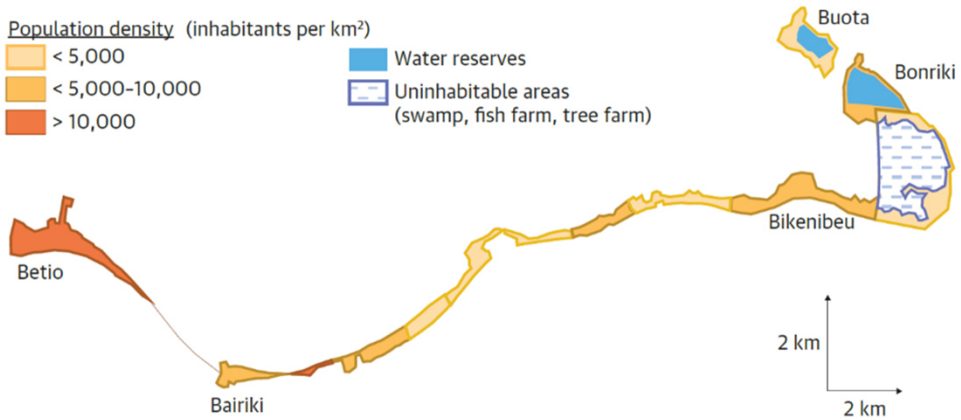
Creating safe and resilient water supply systems for the Pacific communities: Kiribati Public Utility Board's (PUB) holistic approach to water safety planning

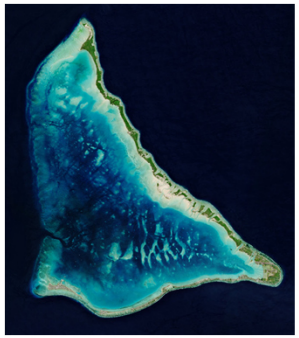
Schedule: August 9, 2022 | 11:00am - 12:30pm

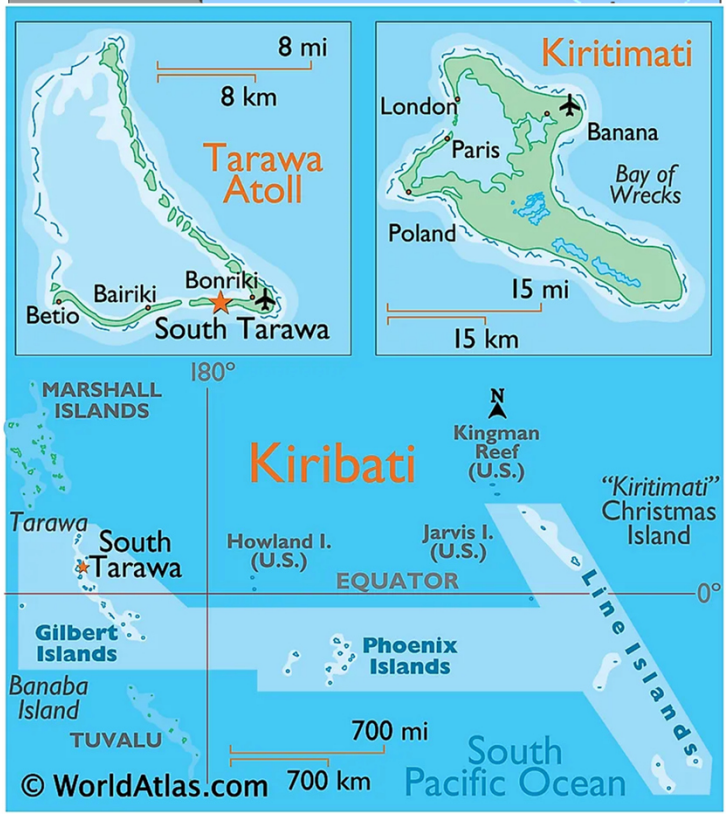
ADB

Kiribati & South Tarawa









PUBLIC UTILITIES BOARD

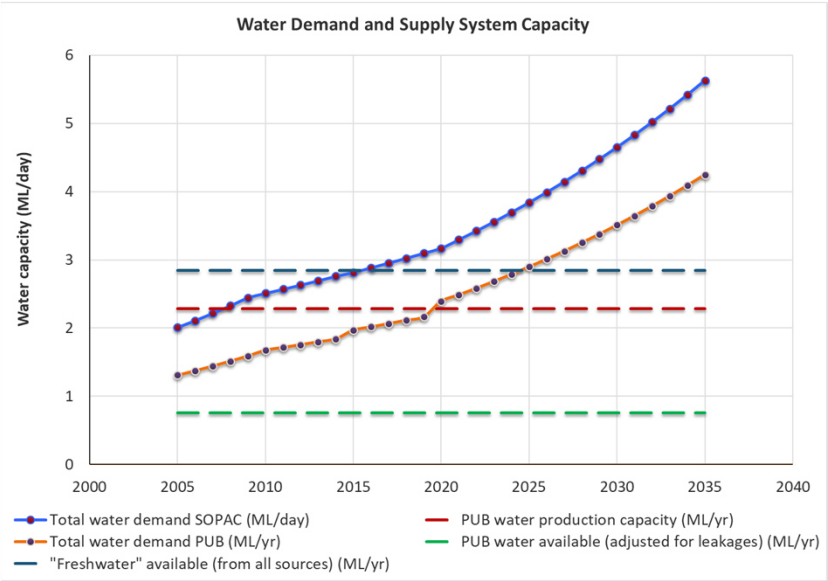
- Population ~ 70,000
- Expected population in 2040 ~ 96,000
- High population density in Betio
- Water and Energy managed and operated by PUB

ADB

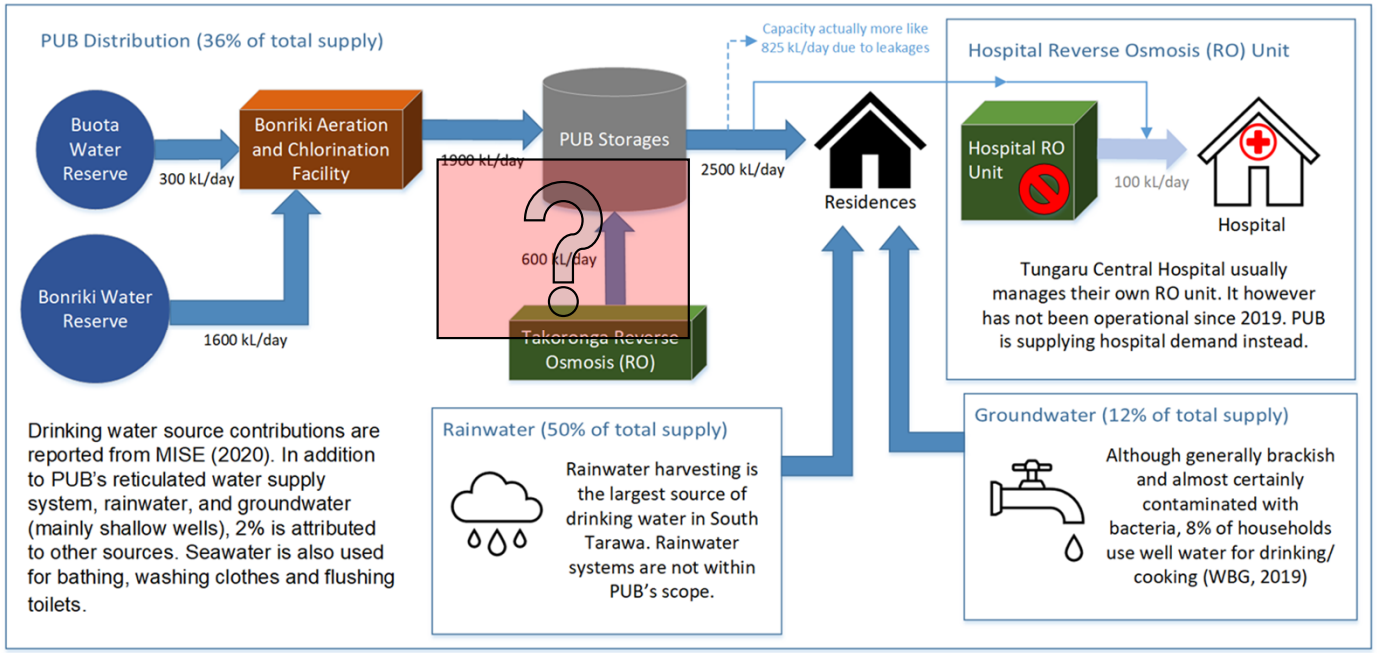
Water system under a number of pressures

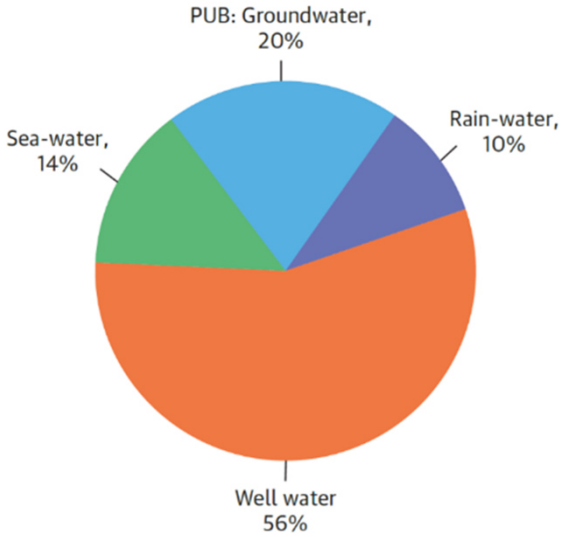
- South Tarawa's population is rapidly increasing
- Rising sea-level due to climate change consuming previously occupied land area
- Increasing ocean levels will increase salinity and reduce sustainable yield extractions
- Treatment plants have asset and operability problems (RO not fully functional)
- Water losses through network are extensive
- Community does not have SOPAC minimum water supply of 50 L/p/d from all sources

Salt water from sea incursions and storm surges has isolated some houses Kiribati's main island of South Tarawa

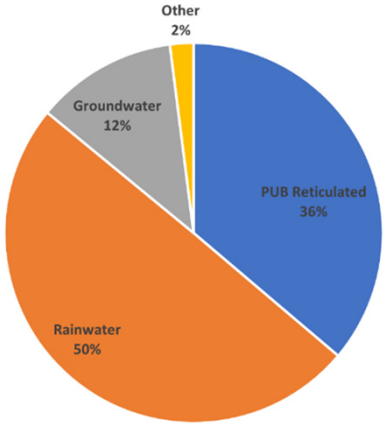


South Tarawa Water Supply





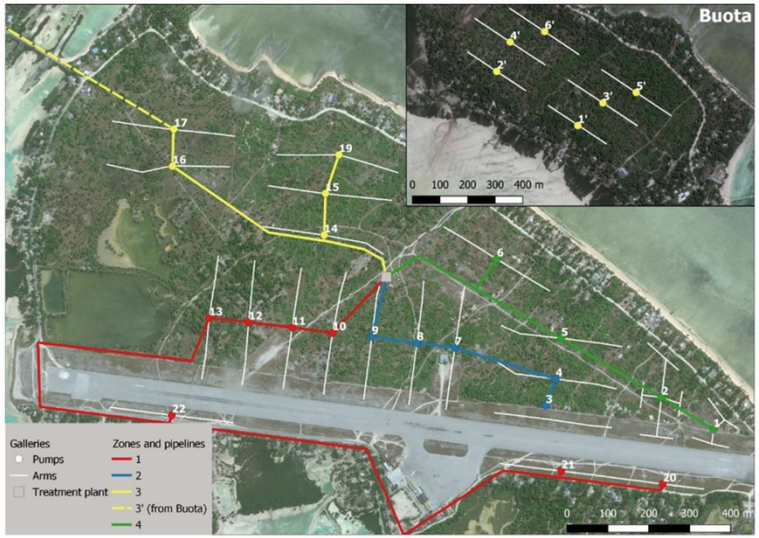
Contribution of water resources to total water supply (World Bank Group 2019)



Kiribati drinking water sources (FCG and Fraser Thomas 2020)

Water safety is a major concern

- Water reserves (which are on the higher lands) have large number contamination activities
  - Airport, cemetery, agricultural, sand/gravel mining
  - Open defecation is common, flush toilets use salt water, broken sewer lines contaminating freshwater lens with fecal- and saltwater.
- Household rainwater tanks and private bores are used to supplement reticulated supply, but both are highly contaminated with E.Coli
  - Weekly random water quality testing across South Tarawa showed the presence of E. coli more than 90% of the time in harvested rainwater (World Bank Group 2019).



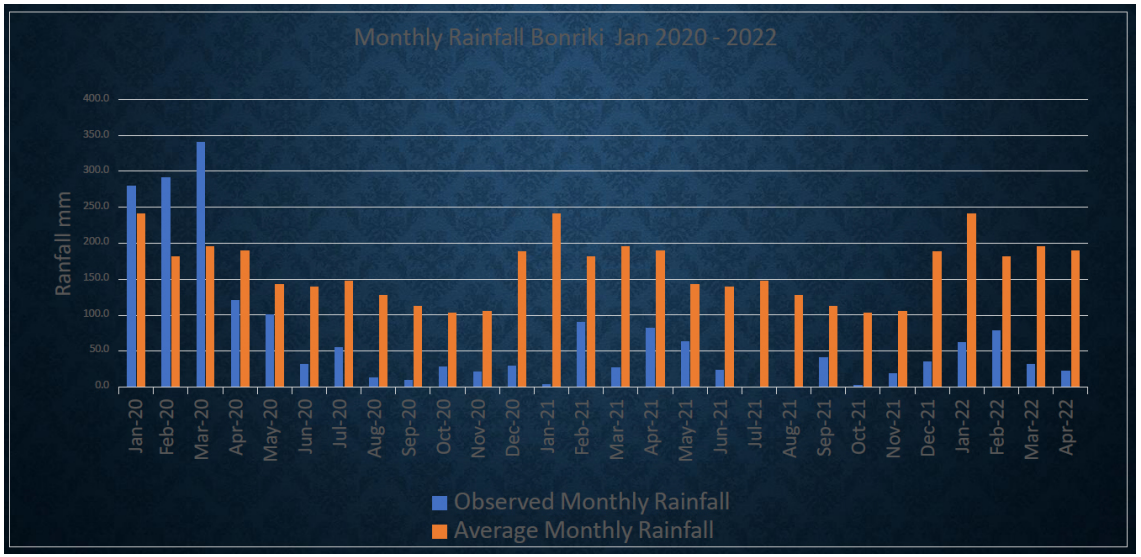
Bonriki and Buota water reserve areas

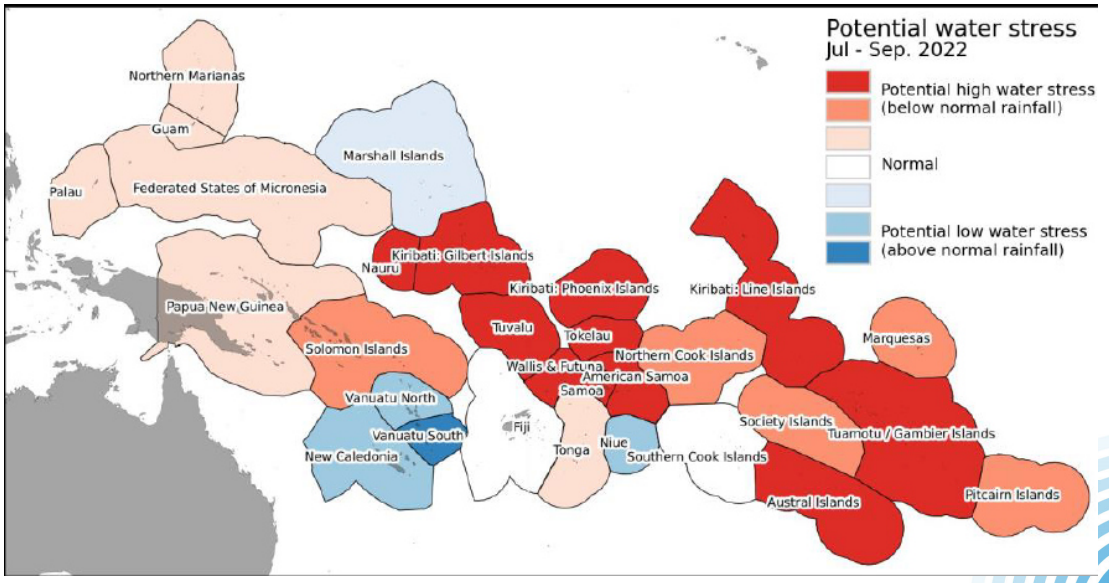
Drought crisis!

- Alert Level 1 – Drought Watch – 3 month rainfall below the 40th percentile
- Alert Level 2 – Drought Warning – 12 month rainfall below the 25th percentile
- Alert Level 3 – Drought Declaration -12 month rainfall below 25th percentile and 7 day averaged salinity at WTP is >1,000uS/cm

Current status

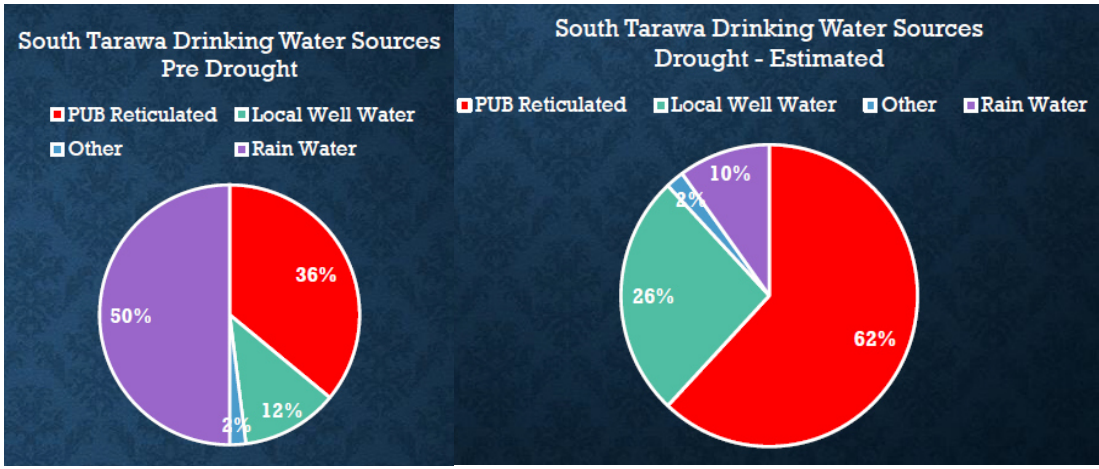
- 12 month rainfall - 5th percentile, (<25th percentile achieved – Feb 2021, <10th percentile Mar 2021) Salinity >1,000uS/cm – Feb 2022
- 3 month outlook KMS – below average rainfall –high confidence

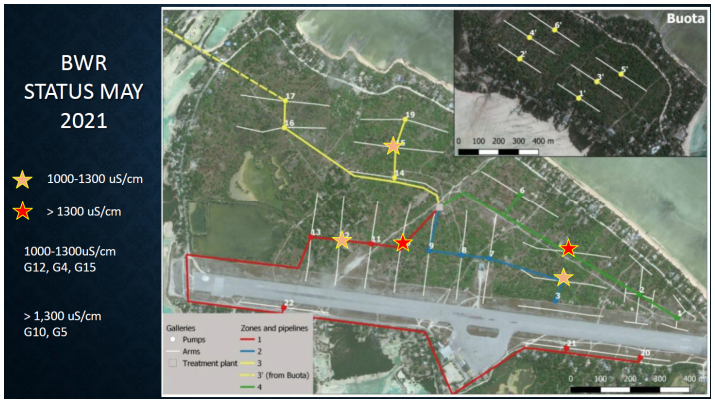


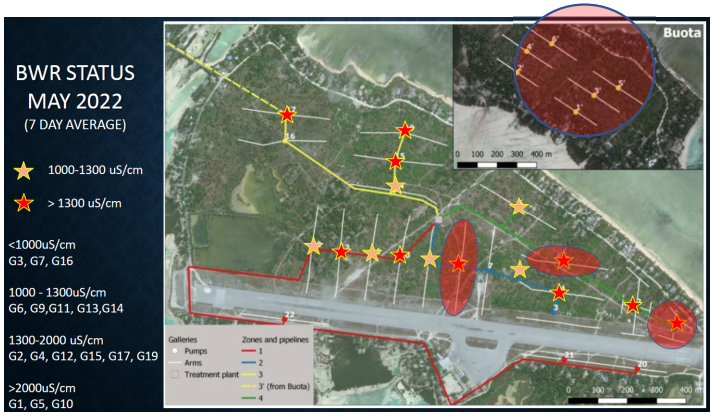


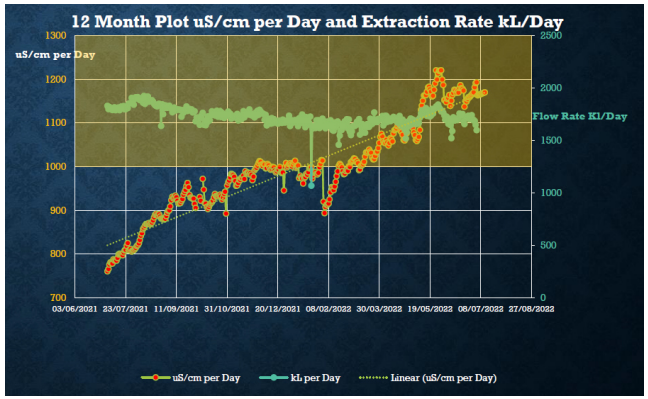
Another pressure

- Community is using more PUB reticulated supply
- Lower rainfall is impacting on salinity of the freshwater lens



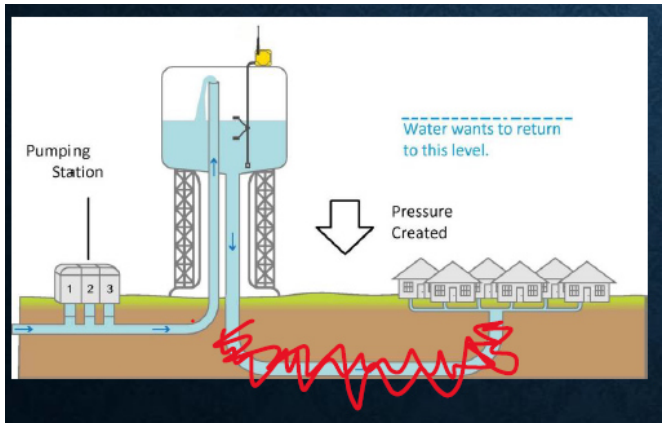






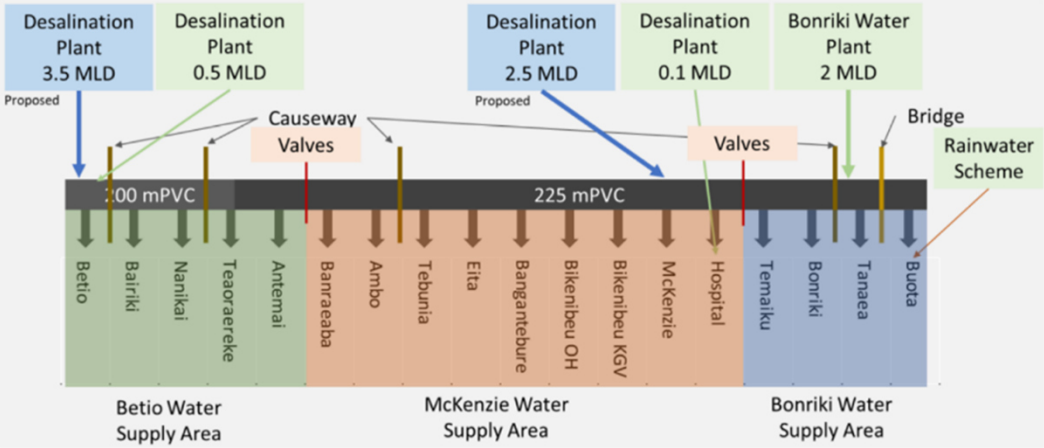
Immediate Drought Response Tasks

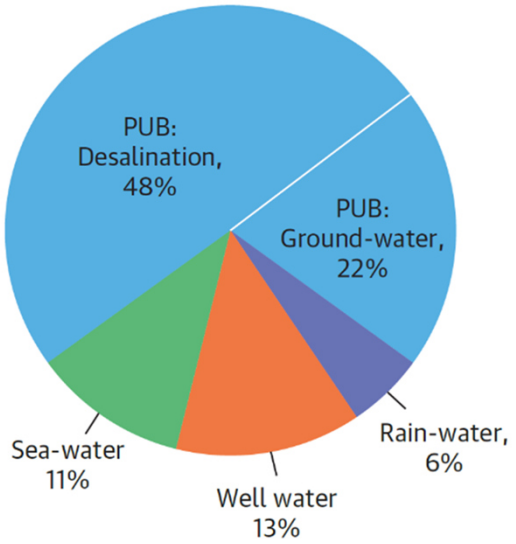
- Existing pipe networks leak >70% ➔ Disconnect house lines from PUB ➔ PUB will locate strategically placed water tanks and standpipes around the township ➔ standpipes and tankering to remove pipeline (remove leakages)
- Reduce freshwater lens extraction from 1.6 ML/d to 0.5 ML/d to prevent salinity
- Still Need more water!! ➔ Reinstate operation of the desalination plant Avonale ➔Additional Desalination Unit
  - 500kL/day Takaronga, Reinstate hospital, 250 kL/day desalination plant to be located at TUC, Additional 200 kL Desal in Betio



Medium to longer term major potential projects

- New pipeline 140mm OD HDPE100 (Funded by NZ) to the existing PUB Water Tower & Betio ring main
- South Tarawa Water Supply Project - establish 6 ML/day capacity of desalinated water.





Way Forward

1. Consider **holistic approach and customized solutions** in addressing complex operational issues and external risks.

2. **Dynamic and adaptive planning is imperative** in mainstreaming water resilience in the context of small island developing states.

3. **Kiribati's water security** depends on diversified sources of drinking water.

4. **Water safety planning** (WSP) helps create a strategy to strengthen water reliability and safety.

5. **Integration of drought monitoring** into WSP and ensuring **timely reporting** to government agencies are key to resilience and sustainability.