Climate, Water, and Projected Changes

Water in an Atoll Environment

RMI National Water and Sanitation Summit
International Convention Center, Majuro, Marshall Islands
March 22-23, 2011
Outline

• What is the RMI’s overall climate change policy and strategy? And how does it address water?
• What are likely climate change impacts on our water resources?
• How can we plan for those impacts?
• “Water Adaptation” projects ongoing
• Final thoughts
• Questions for break out group
RMI Climate Change Policy Framework

• Nine Priority Areas
  – Food and Water Security
  – Energy Security and Conservation
  – Biodiversity and Ecosystem Management
  – Human Resources Development, Education and Awareness
  – Health
  – Urban Planning
  – Disaster Risk Management
  – Land and Coastal Management
  – Transport and Communication
RMI Climate Change Policy Framework

• Five Strategic Goals
  – Sustainable financing and institutional coordination for climate change
  – Energy security and low-carbon future
  – Adaptation for a climate-resilient future;
  – Disaster risk reduction preparedness and response capacity;
  – Building education and awareness, community mobilization, whilst being mindful of culture and gender.
What are likely CC impacts on our water resources?

• Historic data suggests:
  – Less rainfall, less groundwater
  – More salinity of groundwater
  – More C°/F°, more evaporation

• Historic data is being used to project future climate scenarios
“... a 10% reduction in average rainfall by 2050 is likely to correspond to a 20% reduction in the size of the freshwater lens...”

- IPCC 2007
Annual Precipitation (Majuro)
Drought Periods (Majuro)

Figure 2: Average Rainfall compared with Typical Drought Year Rainfall in Millimetre for Majuro Atoll

Drought and Underground Water

Previous 3 mo. Rainfall (inches)

- Jun 8, 1998: 8
- Aug 28, 1998: 39
- Jan 14, 1999: 42
Sea Level Rise and Groundwater

| Historic: | 5cm by 2010 (since 1993) |
| Projected: | 30cm by 2050? |
| Projected: | 90cm by 2100? |
| Projected: | 100cm by 2150? |
Change in Rainfall Patterns

Has the ITCZ “rain band” really moved 300 miles North since 1630 A.D.?

What are the scenarios by 2030?
What are the scenarios by 2090?

• Vulnerability Assessment
  – Based on local historic climate data and Global Circulation Models (GCMs) used by the IPCC
  – Climate models being developed through the following projects:
    – Sustainable Land Management (SLM)
    – UNFCCC Second National Communication (SNC)
    – ADB TA 7394-REG
    – CMI conducting wave and inundation modeling
  – Wisconsin example
Change in Annual Average Temperature (°F) from 1950 to 2006

Source: Center for Climatic Research & Center for Sustainability and the Global Environment, Nelson Institute, University of Wisconsin-Madison
“Water Adaptation” projects ongoing

• Second National Communication (SNC)
  – Conduct a national climate impacts and vulnerability assessment (incl. rainfall)

• ADB TA 7394-REG
  – Build up the airport water catchment resilience 2012-2015
  – Build capacity in use of GIS by combined utilities
Use of GIS...
“Water Adaptation” projects ongoing

• Pacific Adaptation to Climate Change
  – Reduce leakage and provide cover to reduce water loss from evaporation at Majuro reservoirs 2013
  – Improve household water management and supply in Laura to reduce impacts on underground water system 2013
“Water Adaptation” projects ongoing

- SLM
  - Extra water catchments in Laura to reduce impacts on underground water system 2013
  - Profiling atoll from Arrak to Peace Park
  - GIS capacity building
  - Technical Training on agro-forestry with RND employees
  - Demo project on Ebeye for agro-forestry and climate adaptation with RND and KALGOV, Traditional Leadership
Final thoughts

• Climate change is likely to reduce and redistribute the availability of natural fresh water resources in the Marshall Islands

• Large-scale impacts to a variety of sectors
  – Agriculture, Coastal Fisheries, Health, Etc.
Key questions for the breakout group

• How can internal relocation affect resource consumption? Who/where will be most affected?
• Can sufficient rainfall be collected to supply demand, or must other options for water supply be utilized?
• Can we enhance our weather prediction capabilities using traditional ecological knowledge?
• How can we improve water conservation?
• Are the current water awareness programmes sufficient and effective?
• How can we improve water storage and its maintenance both in the outer islands, Kwajalein, and in Majuro?