

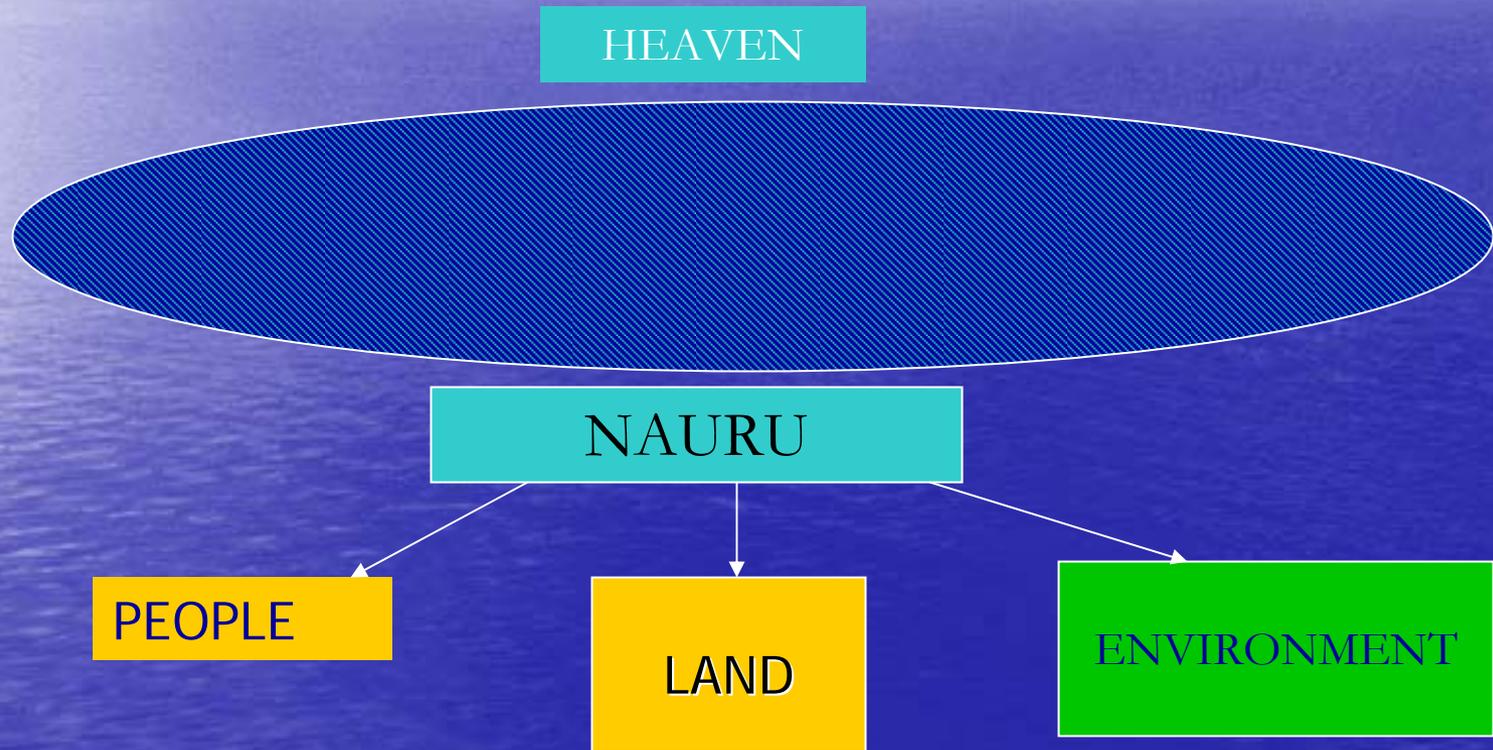
Sustainable Integrated Water Resource Management &
Waste Water Management Project

National Hot Spot Analysis &
Demonstration Concept
Stakeholders Workshop

What is the IWRM PROJECT?

- Integrated water management – *which means ...*
- Knowing your responsibilities
- Fulfilling your roles
- Knowing what others do
- Working cooperatively with others
- Appreciating how actions overlap
- Recognizing that water moves across boundaries
- Helping Serenaid as the Focal Point

The Water Cycle on Nauru



PEOPLE ON NAURU

1992 – 11,300 persons

2002 – 10,065 persons (census)

2006 – 8,500 persons

Looking into the future

2027 – 11,000 persons

Hot spot issues – longevity, public health, child gastro??

Land

Nauru – area is 2200 ha

- mined area is 1400 ha
- coastal strip is 500 ha

Population = 8,500 persons (in 2006)

Households = 1,200 (in 2006)

Thus: $8500/1200 = 7.1$ persons per household

Hot spot issue – ownership of groundwater ??

Environment

- Phosphate mining was an income and rehabilitation now an opportunity to create a new land environment.
- Having pressure in water resources in the coastal strip.
- Nutrients from households seep out onto coastal reef.

Hot Spot Issues: Groundwater contamination?
Coastal enrichment?

RAINFALL ON NAURU

- Source of life for Nauruans and the Nauru environment
- Average rainfall = 2,090 mm/yr
- 1 in 5 dry year = 1,000 mm/yr
- 1 in 10 dry year = 600 mm/yr
- 1 in 20 dry year = 400 mm/yr

Hot Spot Issues: Droughts, prediction of droughts?

HOUSEHOLDS MANAGING THROUGH WATER SUPPLY CRISIS

- Expansion in use of household tanks
- Projects to provide more tanks
- But need to improve guttering
- Small wells and bores at many households
- Also onsite wastewater disposal

Hot Spot Issues: Equitable distribution of tanks, Contamination on bore and well water, Upgrade plumbing skills, trial new sanitation solutions??

HOW MUCH WATER IS NEEDED?

- Generally expect to supply 100 L/person/day
- In 2001, desalination plant supplied 950 kL/day
- Assume 10,065 persons, and 10 % tank water
- So potable supply = $950 + 10\% / 10065 =$
- 104 L/person/day
- (estimate for 2006 = about 65 L/person/day)

POSSIBLE ROOF WATER

**Average roof area is 188
m²**

	Average	1 in 5 years	1 in 10 years	1 in 20 years
Rainfall	2090 mm	1000 mm	600 mm	400 mm
Collect	2000 mm	900 mm	500 mm	300 mm
Volume	376 kL	169 kL	94 kL	56 kL
Supply	145 L/c	65 L/c	36 L/c	22 L/c

Hot Spot Issue: Insufficient supply in dry years

POSSIBLE GROUNDWATER

	Average	1 in 5 years	1 in 10 years	1 in 20 years
Rainfall	2090 mm	1000 mm	600 mm	400 mm
Recharge	800 mm	300 mm	200 mm	100 mm
Volume	8000 ML	3000 ML	2000 ML	1000 ML
Supply	2000 L/c	750 L/c	500 L/c	250 L/c

Hot Spot Issue: Groundwater still to be proven

POSSIBLE FUTURE DEMAND FOR GROUNDWATER BY HORTICULTURE

- Important to increase fresh vegetables/fruit
- Allow 124 ha of horticulture on Topside
- Likely water demand = 6 ML/ha/year
- Hence total of 744 ML/year

Hot Spot Issue: Substantial proportion of groundwater recharge in dry year

Desalination Water Supply

- Large plant closed since 2002 – 600 kL/d?
- Small RO units = 125 kL/d each
- Theoretically 24 L/person/day
- (Actual delivery in 2005/06 = 3 L/person/day)
- So enough for a backup, but not as full supply

Hot Spot Issues: Should we expand RO desalination units?
Are delivery trucks more important than new RO plant?
Is it still a good idea to use waste heat for desalination?

CONCLUSIONS

1. Plan the water supply for 11,000 persons
2. Tank supply – good in average and wet years, must be encouraged – cannot meet all demand
3. Desalination – costly and some delivery risk, but reliable source of water in a drought
4. Groundwater - still to be proven, but should be reliable supply in a drought
5. Will need all three sources of supply to meet the future demand for water

HOT SPOT ISSUES ??

1. Need to increase supply to meet demand
2. Ownership of groundwater?
3. Additional household/community tanks?
4. Plumbing skills?
5. Water efficiency audits?
6. Monitoring of wells and bores?
7. Groundwater contamination?
8. Sanitation – sell new onsite systems?
9. More desalination units?
10. Coastal contamination?