

Majuro and Kwajalein Water Survey Results February 2010

Economic Policy, Planning and Statistics Office

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Survey Presentation

- 1. Background
- 2. Survey Operations
- 3. House Listing and Updated Maps
- 4. Household Descriptions
- 5. Population Descriptions
- 6. Income Descriptions
- 7. Findings and Conclusions

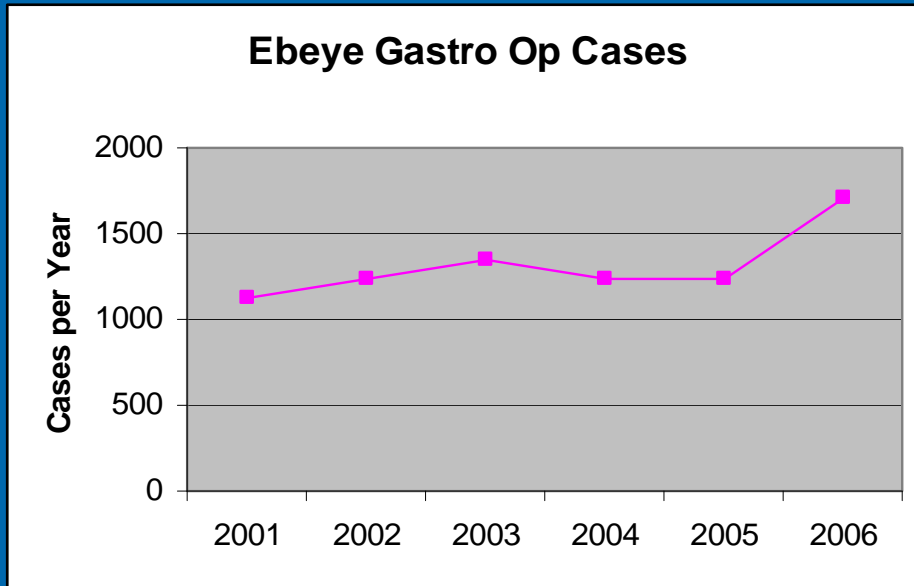
1. Water Survey Background

- Survey largely funded under 9th European Development Fund
- World Bank OECD provided funding assistance for survey
- SOPAC and SPC provided technical assistance for GIS and Data Processing
- MWSC, OEPPC and MPW provided personnel, with additional offers of assistance from MOH and IA

1. Water Survey Background

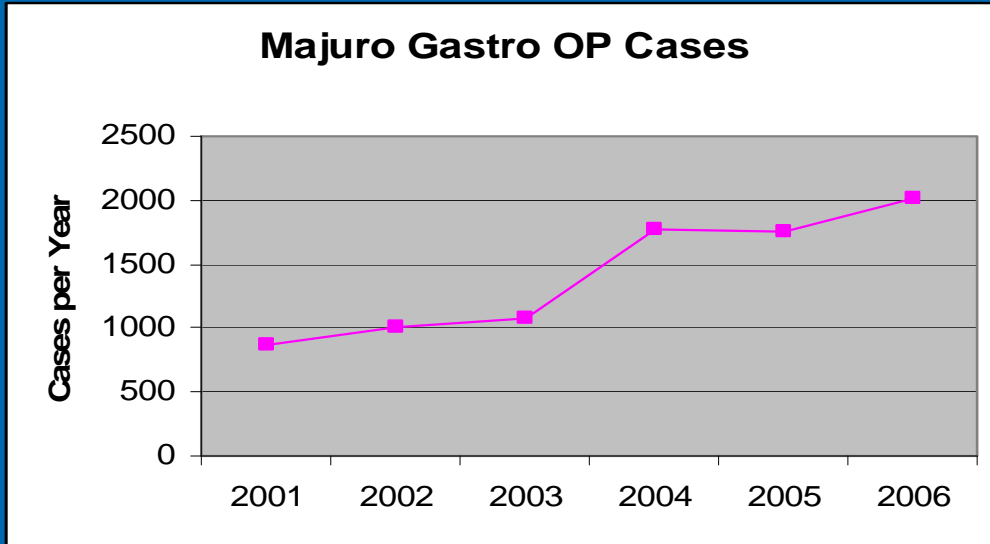
- Late 2006, need to program EU Envelope B Funds for some type of disaster mitigation project, approximately \$1.3 million available.
- Informal discussions had revolved around water, this lead to Cabinet approval in Dec 2006 to support water projects.
- Projects to be supported were; completion of Outer Island Water catchments, Majuro and Ebeye Water catchments, Water trucks for MWSC, Support of water testing programs and supplement support for protection of Laura water lens
- During write up of the project proposal and EU paperwork some interesting and alarming data concerning water borne illness was recognized.

1. Water Survey Background



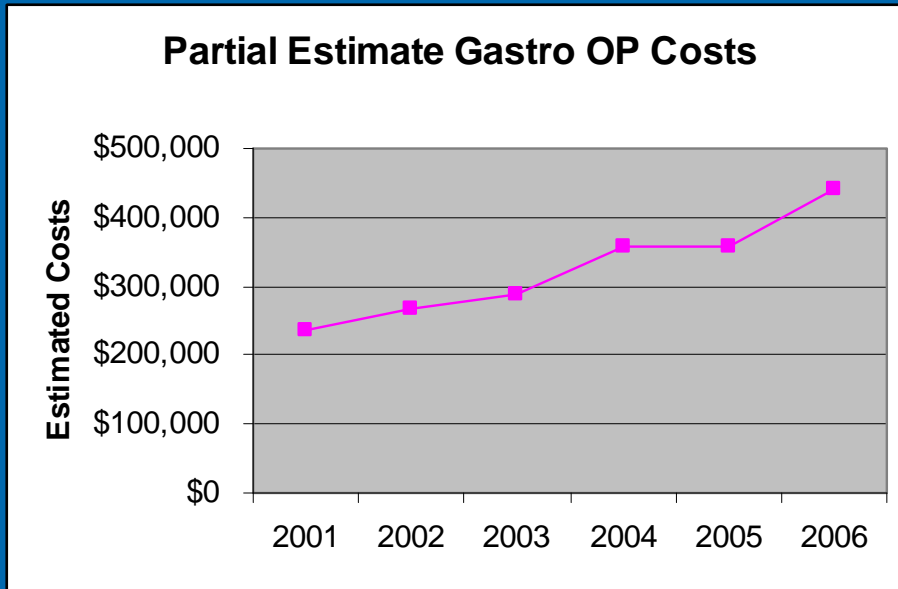
- Between 2001 and 2006 there was a 52% increase in the number of gastroenteritis cases, coupled with cholera outbreak in late 2000

1. Water Survey Background



- Between 2001 and 2006 there was a 133% increase in the number of outpatient gastroenteritis cases, and a typhoid outbreak of about 44 cases in 2006.

1. Water Survey Background



- Between 2001 and 2006 the estimated costs of treatment for gastroenteritis alone, increased by 87%, for an annual estimated cost of nearly \$445,000
- Annual budgets for prevention for water borne consistently under \$50,000 a year.
- An ounce of prevention and pound of cure?
- Urban areas, public and environmental health programs need attention

2. Water Survey Operations

- How would water catchments be distributed? To who, where and why?
- Existing maps and house listings too outdated and did not provide enough information.
- House to house survey on Majuro and Ebeye could solve this problem, as well as prepare for next RMI Census.

2. Water Survey Operations

- Draw on experiences and personnel from Demographic and Health Survey (DHS)
- Use Geographic Information Systems (GIS) to update housing maps
- Develop new enumeration areas (EAs), provide for better analysis using small EAs.
- Survey developed was comprised largely of standard and universal household survey questions, ease of comparison with 88 and 99 Census and any future projects. Form had 33 questions

2. Water Survey Operations

- Use of former DHS personnel meant less need for any extensive training and retained emphasis on high expectations and high quality.
- Major definition issue was to define “no water catchment” as <350 gallons. Smallest popular retail catchment was 400 gallons, definitions for improved water source and WHO minimum indicators for personal water use, made 350 gallons more than an acceptable limit for hh definition of “no water catchment”.

3. House Listings and Maps

- 99 Census, Majuro had 3,080 hh, estimating about 3,200 hh, instead there were 4,238hh! Maps woefully out of date, progress was much slower than planned, need for more resources for project.
- Was tedious work updating maps, needed for matching house listings and determining which hh would receive water catchments, given the scarce resources

3. House Listings and Maps



4. Household Descriptions

Table 1. Total Number of households surveyed by Result and Atoll, 2009

Result	Atoll		
	Total	Kwajalein	Majuro
Total	5,320	1,082	4,238
Completed	4,652	1,032	3,620
Partly completed	1	0	1
Refused	39	3	36
Vacant	445	28	417
Household not available	56	12	44
Other	127	7	120

Source: RMI Water Survey 2009

4. Household Descriptions

Table 22. Atoll by Water Catchment Available

Atoll	Catchment Available			
	Total	Yes	No	Not reported
Total	4,652	2,689	1,963	-
Kwajalein	1,032	378	654	-
Majuro	3,620	2,311	1,309	-

Source: RMI Water Survey 2009

4. Household Descriptions

- In Majuro (Table 23), Zones 19, 20, 21 and 22 (Arrak and Laura) are by far the worst affected by lack of household water storage. In these areas over 50% of homes have no effective household water storage and this, in turn, places more pressure on the Laura water lens as a significant number of households use the lens water for everyday household needs. More household water catchments can reduce this pressure on the Laura water lens, thereby reducing the potential damage to the Laura water lens. Overall, just over 36% of homes on Majuro are going without sufficient household water storage.
- The situation on Ebeye and some islands on Kwajalein atoll (table 24) are more serious than Majuro; in fact the percentage of households without sufficient water storage on Kwajalein is almost double the rate on Majuro Atoll, with just over 63% of all households not having a water catchment available. The areas with the most significant problems are Enubirr, Ebeye Zone 9, Ebeye Zone 11 and Carlos.

4. Household Descriptions

Table 36a. Atoll by Water available from main source throughout the year

Atoll	Main Water Source				
	Total	Yes	% Yes	No	% No
Total	4,652	1,902	40.9%	2,750	59.1%
Kwajalein	1,032	358	34.7%	674	65.3%
Majuro	3,620	1,544	42.7%	2,076	57.3%

Source: RMI Water Survey 2009

4. Household Descriptions

Table 35. Main source of drinking water by Atoll

Drinking Water	Atoll		
	Total	Kwajalein	Majuro
Total	4,652	1,032	3,620
Public piped water	208	173	35
Rain catchment	1,966	183	1,783
Bottled water	811	93	718
Well	2	-	2
Neighbor's	1,632	583	1,049
Others	33	-	33
Not reported	-	-	-

Source: RMI Water Survey 2009

4. Household Descriptions

Table 39. Atoll by water available from your main source throughout the year

Atoll	Water Available			
	Total	Yes	No	Not reported
Total	4,652	2,193	2,459	-
Kwajalein	1,032	182	850	-
Majuro	3,620	2,011	1,609	-

Source: RMI Water Survey 2009

4. Household Descriptions

Table 40. Atoll by Number of households face most scarcity of water for everyday use

Atoll	Scarcity							
	Total	Often	% Often	Sometimes	% Sometimes	Not much	% Not Much	
Total	2459	1251	50.9%	1044	42.4%	164	6.7%	0
Kwajalein	850	491	57.8%	322	37.9%	37	4.3%	0
Majuro	1609	760	47.2%	722	44.8%	127	7.9%	0

Source: RMI Water Survey 2009

5. Population Description

Table 1. Number of households by Type of Family by Atoll

Type of Family	Atoll		
	Total	Kwajalein	Majuro
Total	4,652	1,032	3,620
Immediate Family	2,333	233	2,100
Joint/extended	2,319	799	1,520
Not reported	-	-	-

Source: RMI Water Survey 2009

5. Population Description

Table 2 Number of Households by ethnicity or race by Atoll

ethnicity	Atoll		
	Total	Kwajalein	Majuro
Total	4,652	1,032	3,620
Marshallese	4,223	994	3,229
Micronesian	39	4	35
Australian	6	-	6
New Zealander	3	-	3
Chinese	40	-	40
Japanese	18	-	18
Philipino	159	27	132
USA	69	5	64
Other	95	2	93
Not reported	-	-	-

Source: RMI Water Survey 2009

5. Population Description

- The population figures for the households surveyed on the two atolls were a combined 38,322 people. The total population of Ebeye, Kwajalein Atoll zones 7 – 11, is 9,360 people and on Majuro Atoll the total population was 27,699 people. The population for Ebeye during the 1999 Census was 9,345 people and for the 1988 Census 8,324 people. The population for Majuro during the 1999 Census was 23,676 people and for the 1988 Census 19,664 people.
- There were some interesting survey results with average household sizes for Majuro and Kwajalein. The combined average household size for the two atolls was 8.24 people
- On Kwajalein the average household was 10.3 people, with a range of 6.1 to 12.99 people per household depending on the zone or island.
- On Majuro there were only 7.65 people per household and the range was much tighter than on Kwajalein, ranging from 5.61 people, at the end of Laura, to 9.28 people in Jenrok village.

5. Population Description

Table 9. Population in households without water catchment

Total Population	Pop without water catchment	% Total pop without water catchment	Total Kwajalein	Kwaj Pop without water catchment	% Kwaj pop without water catchment	Total Majuro	Majuro Pop without water catchment	% Majuro pop without water catchment
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38,322	14,374	37.5%	10,623	5,463	51.4%	27,699	8,911	32.2%
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5. Population Description

Table 10. Household population by five year age-group without water catchment by Atoll, 2009

	Total	% Total	Kwajalein	% Kwaj	Majuro	% Majuro
Total	14,374	100%	5,463	100%	8,911	100%
0 - 4 yrs	2,262	15.7%	858	15.7%	1,404	15.8%
5 - 9 yrs	2,032	14.1%	791	14.5%	1,241	13.9%
10 - 14 yrs	1,578	11%	650	11.9%	928	10.4%
15 - 19 yrs	1,384	9.6%	557	10.2%	827	9.3%
20 - 24 yrs	1,473	10.2%	478	8.7%	995	11.2%
25 - 29 yrs	1,236	8.6%	451	8.2%	785	8.8%
30 - 34 yrs	1,042	7.2%	359	6.6%	683	7.7%
35 - 39 yrs	828	5.8%	340	6.2%	488	5.5%
40 - 44 yrs	734	5.1%	290	5.3%	444	5%
45 - 49 yrs	607	4.2%	248	4.5%	359	4%
50 - 54 yrs	441	3.1%	181	3.3%	260	2.9%
55 - 59 yrs	351	2.4%	133	2.4%	218	2.4%
60 and over	406	2.8%	127	2.3%	279	3.1%

6. Income Description

- According to the survey results 46.6% of all households on Mauro and Kwajalein earned less than \$10,000 annually. On Kwajalein, 30.5% of households earned less than \$10,000 and on Majuro the figure was reported at 51.1%. The most alarming element of this for Majuro is that 11.8% of households reported having no annual income at all.
- So on Kwajalein 48.9% of all households earned less than \$16,000 annually and on Majuro 72.4% of households earned less than \$16,000 annually.
- Based on these income figures and what has been reported in the past about the very high level of household and consumer debt in the RMI, it is not feasible to expect most households are in a position to purchase water catchment systems unless there is some type of specialized assistance with loans, grants or donor sponsored projects made available to households for this purpose.

6. Income Description

- There were some interesting results with household income, with average households on Kwajalein having 29.4% income (\$18,933 vs \$14,632) than the average Majuro household. However, with the average Kwajalein household being 10.3 people compared to Majuro's 7.65 people per household this would come to \$1,838 per person on Kwajalein and \$1,913 per person on Majuro. Given that consumer prices consistently range between 20% - 30% higher on Ebeye than Majuro, many households on Ebeye will face some challenges meeting basic household needs than on Majuro.
- Of the 1,309 homes, on Majuro identified in Table 5 below, as having no water catchment 51% (669 households) of these households reported earning less than \$10,000 annually. Of the 1,309 total, 68.7% (899 households) of households with no reported water catchment earn less than \$16,000 annually.
- On Kwajalein (Table 6) the same pattern exists, the lower the income level the more likely the household is to be without household water storage. However the situation on Kwajalein is much more severe in terms of the number of households that do not have water storage.

7. Conclusions and Recommendations

- There is a critical need for more household water catchments based on the increasing levels of water borne illness reported on Majuro and Ebeye. Budget would be approx \$2 million, but could also be public works scheme, solve a problem, put people to work, increase local economic activity.
- Conduct review of existing gaps in provision of current Public/Preventative Health model and ability of government to provide water in extended dry periods or other emergency situations.
- The need to pay attention to environmental health and its effects on the community through the use of better surveillance methods, particularly with use GIS systems.

7. Conclusions and Recommendations

- **Improve and Increase level of public awareness and basic public health education concerning water and other preventative health issues**
- **Expansion of Water Quality Testing Programs and Training Personnel in government and NGOs**
- **Creation of a National Water Office, Develop New National Water Policies and Operational Plans**

8. Concluding Observations

- Access to water is a much larger problem than originally thought;
- Poverty is a real, serious and growing issue in the urban areas of RMI, of this there is NO doubt – no water, no electricity, high unemployment, stagnant wages, rising prices, need to improve government services and access to information;
- Innovative approaches, “can do” attitude, collaboration, accountability can make a difference

Kommol Tata

