



Kwajalein Atoll Household Water Catchments Proposal to AusAid



Republic of the Marshall Islands

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Background

Located north of Kiribati and east of Federated States of Micronesia, the Republic of the Marshall Islands consists of 29 low-lying atolls and 5 single-coral islands, covering 2 million square kilometers EEZ with limited total landmass of only 181 square kilometers. Highest elevation is 10 meters above sea level with average elevation of 2 meters. Southern part of the Marshall Islands receives more rainfall annually than the northern atolls and islands, including Kwajalein Atoll.

The capital is located on Majuro Atoll. Over the past centuries, Marshall Islands has shared colonial history with Spain, Germany, Japan and finally the United State before becoming an independent island nation in 1979. Shortly in 1986, Marshall Islands entered into bi-lateral agreement with the United States known as the “Compact of Free Association” which effectively concluded the United Nation Trusteeship status that later allowed the new island nation to obtain membership of the United Nation.

Marshall Islands has since established diplomatic ties with number of nations including Australia. This bi-lateral relationship has been nurtured and enhanced over the years thru various assistance programs such as the successful maritime surveillance, scholarship and other programs. Recently, under the “Australia and Republic of the Marshall Islands – Partnership for Development Agreement,” which support the UN Millennium Development Goal (MDG), both governments entered into higher level of partnership that states;

“This Partnership for Development between the Government of Australia and Government of the Republic of the Marshall Islands establishes our shared vision to work together in close cooperation to meet our common challenges and to raise the standard of living for the people of the Republic of the Marshall Islands.”

The covenant further recognizes that vital importance of the energy and water sectors as two areas to improve the standard of living. Specifically, some of the key objectives agreed include;

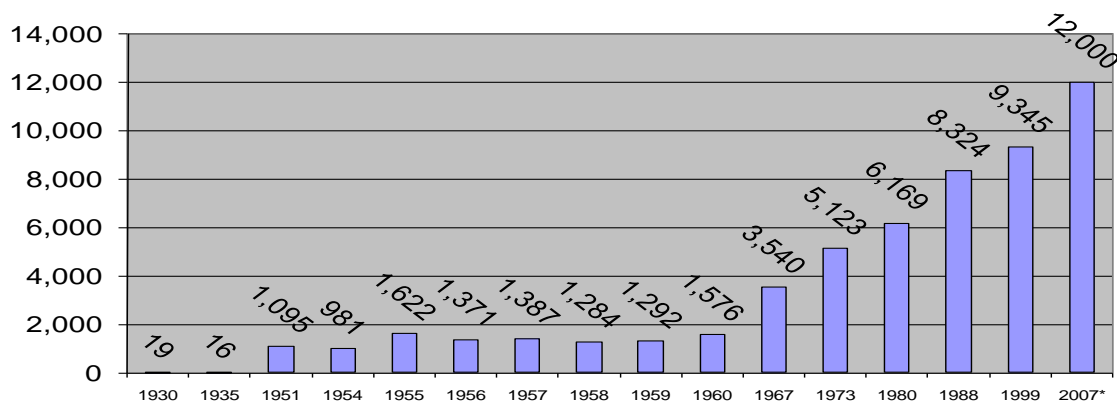
- Increase coverage of surveyed households on Majuro and Ebeye with limited or no access to clean water (either household catchments or municipal water) to 95% in 2015;
- Current level of detected water borne illness reduced by 75% by 2015;

Hence, this proposal aims to meet these specific objectives with funding proposal of \$315,000 to provide, distribute and install 220 water catchments to the island communities within Kwajalein Atoll, namely Ebeye, Eniburr, Ebadon and Mejato.

Some Basic Facts on Kwajalein Atoll

The population of Kwajalein Atoll has grown rapidly since the 1960s. Recent census shows there are 11,408 persons in the atoll most of whom are residing on Ebeye Island. This is equivalent to nearly one quarter of the Marshall Islands' entire total population of about 53,000.

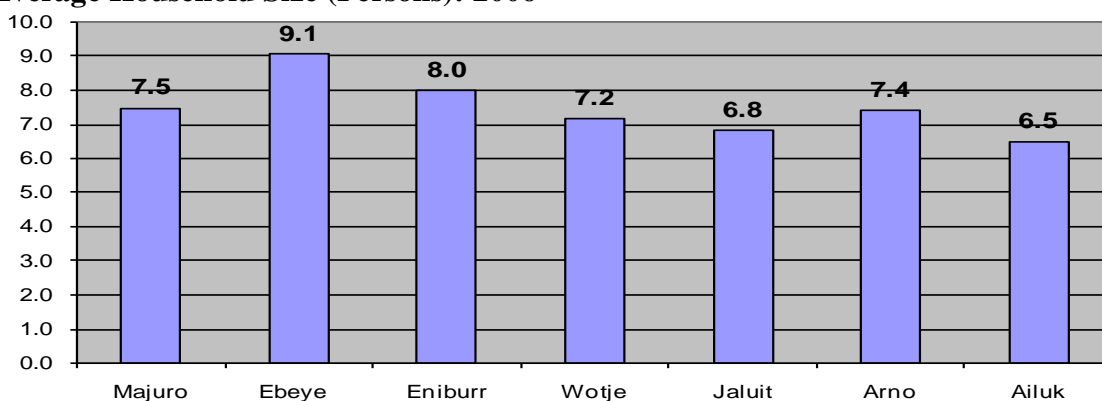
Kwajalein Population: 1930 to 2012



Source: RMI Census Reports, EPPSO

Kwajalein Atoll is one of the world's largest coral atolls as measured by area of enclosed water. Comprising 97 islands and islets, it has a land area of 16.4 km² and surrounds one of the largest lagoons in the world, with an area of 2,174 km². Per preliminary 2011 Census, there are about 1,420 households in Kwajalein Atoll with 1,135 on Ebeye alone. Households on Ebeye are much more crowded than households in other communities in Kwajalein Atoll and rest of the Marshall Islands. Survey shows an average household size of Ebeye is 9.1 persons, making it the most crowded in the Marshall Islands.

Average Household Size (Persons): 2006



Source: RMI 2006 Community Survey, EPPSO

Water Challenge on Kwajalein Atoll

Not surprisingly, crowded living conditions on Ebeye have social, health, environmental and other negative impacts on the community. In addition, the island basic infrastructures constantly face with the highly corrosive and humid surrounding. Power, water and wastewater operational services require continuous and regular maintenance. Often time, the utility operator on Ebeye, Kwajalein Atoll Joint Utilities Resources, would seek financial support from the Marshall Islands' Government to cope with the challenge of producing and distributing water using reverse osmosis (RO) system.

Presently there are 3 RO units but only one is running. Two of the machines produce 100,000 gallons per day while the third machine produces 150,000 gallons. In December 2011, the entire reverse osmosis water system on Ebeye experienced complete system failure. The crowded community was left without public water service over three weeks. Such incident, unfortunately, often occurred which is why people obtain water catchment as their alternative source of water.

However, not all people are able to afford water catchments. Recent survey shows that 56% of households on Kwajalein use the water catchments of their neighbors as main source of drinking water. The culture of sharing is expected but this situation places great stress on all the households as a result of water scarcity and lack of access to fresh water. Ebeye residents were asked to list their community's major problems (e.g., the major sources of their hardship). The top five problems identified by the people were:

1. Power problems
2. Water problems
3. High cost of living
4. Overcrowding
5. Poor sanitation

Source of drink by the rain catchments consist of 42.3% of households on both Kwajalein and Majuro. But on Kwajalein, rainwater catchments provide only 18% of households with drinking water. This figure seems much too low given the situation with water borne illness on Ebeye. One thing is clear that more than half of the Ebeye households seek drinking water from their neighbors.

Main Source of Drinking Water

| Drinking Water | Kwajalein | Percentage |
|---------------------------|-----------|------------|
| Total | 1,032 | 100% |
| Public piped water | 173 | 17% |
| Rain catchment | 183 | 18% |
| Bottled water | 93 | 9% |
| Well | - | 0% |
| Neighbor's rain catchment | 583 | 56% |

Source: RMI Water Survey 2009

There is a significant increase in the use of rain water catchments as a source of drinking water. In the 1988 Census, rainwater tanks were identified as a source of drinking water in only 20.5% of homes. By the 1999 Census this figure had increased to 63.1% of homes. Household surveys since the 1999 Census indicate that this upward trend has continued.

Table below indicated that 59% of all households on Majuro and Ebeye reported that there are periods of no water availability throughout the course of a year. On Ebeye, over 65% of households reported not having water available and the figure was 57% on Majuro. It has been identified that when access to water is diminishing, the rates of water borne illness rise.

Atoll by Water Available from Main Source Throughout the Year

| Atoll | Main Water Source | | | | | |
|-----------|-------------------|-------|-------|-------|-------|--------------|
| | Total | Yes | % Yes | No | % No | Not reported |
| 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

Base on the last water survey conducted in 2009, the total number of houses with no catchments on Kwajalein Atoll is 654. The situation on Ebeye and other communities within Kwajalein Atoll face more serious water concern than Majuro. In fact, the percentage of households without sufficient water storage on Kwajalein is almost double the rate on Majuro Atoll. The areas identified with the most significant water problems are Ebeye, Eniburr, and Carlos.

Between 2001 and 2006, there were about 1,100-1,300 reported cases of waterborne illness, effecting one of every 8 Ebeye residents annually. By comparison, the rate in Majuro has been one in fifteen people affected by water borne illness annually. Lack of access to water at the household level on Ebeye and its neighboring islands is deemed a significant contributor to higher rates of water borne illness.

Number of Households by Water Catchment Availability, Kwajalein Atoll in 2009

| Kwajalein Zones/Villages | Catchment Availability | | | |
|--------------------------|------------------------|-----|-----|-------|
| | Total | Yes | No | % No |
| Total | 1,032 | 378 | 654 | 63.4% |
| Eniburr | 88 | 29 | 59 | 76% |
| Gugeegue | 49 | 29 | 20 | 40.8% |
| Ebeye Zone 7 | 172 | 89 | 83 | 48.3% |
| Ebeye Zone 8 | 165 | 68 | 97 | 58.8% |
| Ebeye Zone 9 | 143 | 45 | 98 | 68.5% |
| Ebeye Zone 10 | 153 | 60 | 93 | 60.8% |
| Ebeye Zone 11 | 235 | 49 | 186 | 79.1% |
| Enubuj | 11 | 7 | 4 | 36.4% |
| Carlos | 16 | 2 | 14 | 87.5% |

Source: RMI Water Survey 2009

In addition to health concern, Ebeye is also known to have non-attendance problem among its students compared to other communities. In 1999, only 82% of Ebeye children between ages of 6 to 14 were actively attending school. In 2006 the percentage was only slightly higher at 85%. Ebeye's attendance rates are among the lowest in all the Marshall Islands and residents attribute this, at least in part, to the poor quality of basic services on the island, including water.

| SCHOOL ATTENDANCE 6 TO 14 YEARS | Total | Majuro | Ebeye | Eniburr | Wotje | Jaluit | Arno | Ailuk |
|----------------------------------------|--------------|---------------|--------------|----------------|--------------|---------------|-------------|--------------|
| 2006 survey | 88% | 87% | 85% | 88% | 90% | 96% | 97% | 92% |
| 1999 census | 84% | 83% | 82% | 88% | 85% | 92% | 81% | 71% |

Project Benefits - Water Catchments

The Government of the Marshall Islands has placed this Water Catchments Project at high priority given its positive impacts toward increase water accessibility, reduce water borne diseases and improve general living condition of the communities. Recognizing the urgent need for improving clean water accessibility, numbers of bi-lateral and regional partners have responded favorable at the request of the Marshall Islands' Government.

Starting in 2010, about 250 water catchments were distributed to households in Carlos, Carlson and Ebeye of Kwajalein Atoll by the generosity of the European Union (EU). Last year AusAid joined the effort and supported the “Ebeye Water Catchment Project Phase I” by providing 160 catchments to Ebeye and Gugeegu households. This project is now 95% completed.

With 410 catchments distributed already, the needed number now stands at 244 catchments remain throughout the Kwajalein Atoll, namely the islands of Ebeye, Eniburr, Ebadon and Mejato. However, the proposal seeks 220 catchments with two types of capacity (1,500 gallons and 1,000 gallons type). Reason of the reduction in number is due to space limitation of certain households’ surrounding.

This “Kwajalein Atoll Household Water Catchments Proposal to AusAid” is submitted herein as Phase II for the kind consideration of the Australia Government in consistent with the Partnership for Development Agreement. The cost breakdown is indicated below.

Estimated Project Cost

| | <u>Description</u> | <u>Quantity</u> | <u>Total</u> |
|----|----------------------------------|-----------------|-------------------|
| a. | 1,000 gallons polyethylene tanks | 120 | 98,000.00 |
| b. | 1,500 gallons polyethylene tanks | 100 | 120,000.00 |
| c. | First Flush Device | | 3,000.00 |
| d. | Gutter System | | 14,000.00 |
| e. | Spouting System | | 30,000.00 |
| f. | Installation Work | | 25,000.00 |
| g. | Inter-island Delivery | | 10,000.00 |
| i. | Contingency | | 15,000.00 |
| | | Total: | <u>315,000.00</u> |

Other Aspects of the Project

GROUND SPACE ON EBEYE

Space within most households' vicinity on Ebeye is tight which explains the reason for reduction in number of water catchments from identified 244 households needing water catchments to 220 instead. In addition, the size of the catchments is mostly smaller size which is the 1,000 gallons and rest is the standard size of 1,500 gallons.

CLEANING AND MAINTENANCE OF CATCHMENTS

Individual household shall be primary responsible to maintain their own tanks. Through the RMI Environment Protection Authority located on Ebeye, series of promotion and awareness activities are planned on annual basis. In addition, prior to distribution of the catchments, Office of the Chief Secretary shall coordinate with RMI EPA to provide awareness pamphlet and disseminate contact information if need assistance. Lately, EPA has been proactive on the issue of clean water by retrieving numerous sample water from the community to conduct lap test and notify the results with recommendation which is part of its mandate function.

As for the vendor, the catchments supplier shall be required to provide screen lid and cleaning guide to the household owners. Such activities noted herein shall also include those households with water catchments distributed prior.

TENDERING PROCESS

Subject to domestic procurement rule, it is intend of the Marshall Islands' Government to issue public bid for any interested parties to submit their bids. All the necessary document, publication and determination shall be conducted in accordance to the existing procedure and requirement of the government.

MONITORING PROCESS

The Marshall Islands' Government through the Office of the Chief Secretary, in close coordination with the Kwajalein Atoll Local Government, shall be the focal point to monitor the implementation of the project and submit timely report as required. There shall be dedicated personnel on both Majuro and Ebeye to ensure the necessary support and required tasks are met on timely basis. Distribution and installation of the materials shall be primarily on Ebeye but inter-atoll (island to island) sea transportation will be required to transport the materials and personnel to other communities within the atoll.

ACQUITTAL PROCESS

The Marshall Islands' Government will commit to the terms and reporting requirement of acquittal regarding this proposal. All transaction, payment and receipts shall be processed through the Ministry of Finance's system with the proper oversight signatures from the Office of the Chief Secretary and Ministry of Finance. Once project is completed, all necessary transaction and supporting documents shall be provided within six months period.