Republic of Marshall Islands
Water & Sanitation Sector

Final Report

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Abbreviations

ACP	African, Caribbean and Pacific Group of States
ADB	Asian Development Bank
AusAID	Australian Agency for International Development
BMZ	German Federal Ministry of Economic Cooperation and Development
BOM	Bureau of Meteorology (Australia)
CADRE	Climate Adaptation, Disaster Risk Reduction and Education Program
CCA	Climate Change Adaptation
CCCPIR	Coping with Climate Change in the Pacific Islands Region
CMI	College of Marshall Islands
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DRM	Disaster Risk Management
DUD	Delap-Uliga-Djarrit
EPA	Environmental Protection Authority
EU	European Union
FEMA	Federal Emergency Management Authority (United States)
GCCA	Global Climate Change Alliance
GEF	Global Environment Facility
GIS	Geographical Information Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GPS	Global Positioning Systems
IOM	International Organization for Migration
IWRM	Integrated Water Resource Management
JIRCAS	Japanese International Research Center for Agricultural Sciences
JNAP	Joint National Action Plan for Climate Change and Disaster Risk Management
KAJUR	Kwajalein Atoll Joint Utilities Resources
MICS	Marshall Islands Conservation Society
MIMA	Marshall Islands Mayors Association
MIMRA	Marshall Islands Marine Resources Association
MIVA	Marshall Islands Visitors Authority
MoE	Ministry of Education
MWSC	Majuro Water and Sewage Company
NAP	National Action Plan
NGO	Non-Government Organization
NOAA	National Oceanic and Atmospheric Administration
OEPPC	Office of Environmental Planning and Policy Coordination
PACC	Pacific Adaptation to Climate Change
PAC-TAM	Pacific Technical Assistance Mechanism
PAC-SAP	Pacific Adaptation Strategy Assistance Programme
PICCAP	Pacific Islands Climate Change Program
PIFS	Pacific Islands Forum Secretariat
PREL	Pacific Resources for Education and Learning
RMI	Republic of Marshall Islands
R&D	Resources and Development
RO	Reverse Osmosis
SLM	Sustainable Land Management
SOPAC	Applied Geoscience Division of SPC
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environmental Program
STAR	System for the Transparent Allocation of Resources

UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USAID	United States Agency for International Development
USP	University of South Pacific
WAM	Waan Aelon in Majel
WASH	Water, Sanitation and Hygiene
WUTMI	Women United Together, Marshall Islands

Executive Summary

RMI has a uniquely fragile water resource network due to its small size, lack of storage, and limited fresh-water capacity. The situation is multiplied by limited investments made in water and sewage management and infrastructure. Furthermore, until recently little attention has been paid to the potential effects of climate related extremes on RMI's current water resources, especially with regards to salt-water intrusion, which negatively affects the limited freshwater lens on some of the lower-lying islands and atolls. On the Majuro Atoll, where over 50% of the population reside, the water supplies rely on the airport runway catchment area, from where water is piped to the city's principal reservoir, and the Laura freshwater lens. Hygiene and sanitation continue to be a concern and a particular challenge is to manage a sewage system without contaminating the ground-water lens. Already, some of the country's fresh-water lens has been contaminated with brine, from over-extraction and coastal movements from human development practices and erosion.

The country's main strategic development document, *Vision 2018*, sets out water as one of its key priorities and the Draft National Water Policy, *appendix 1*, is currently being developed to set out guidelines for the water and sanitation sector moving forward. Water is also integrated into both the Climate Change Policy and the Disaster Risk Management Policy and subsequently into the Draft Joint National Action Plan for Climate Change and Disaster Risk Management (JNAP).

There are many donor funded water programs that cover various aspects of the water sector from education programs to suppling rainwater catchment tanks. Furthermore there are specialized climate change and disaster risk management programs that focus programs on drought resistance and climate change adaptation measures protecting groundwater lenses.

There are, however, many areas within the water and sanitation sector that require further programs and management actions in such fields as public systems, rainwater catchments, groundwater, water quality and human health, emergency preparedness, water conservation and outreach programs.

The RMI Government has prioritized an enhanced coordinated GIS capacity within the water and sanitation sector, especially in developing a detailed water infrastructure network including the MWSC network, private wells, rainwater tanks and septic tanks and household coverage, *appendix 2*. This would allow for identifying disadvantaged households, water storage capacity, household connections, water usage trends and minimising potential risks to human health. Other programs that can be incorporated using the increased GIS capacity are water conservation and water quality monitoring programs.

1. Introduction

As many other island nations, the RMI have uniquely fragile water resources due to their small size, lack of storage, and limited fresh-water. According to the *RMI 2011 Census*, rainfall catchment supplies over 79% of the household water supplies. Increases in population on the two urban islands Majuro and Kwajalein (Ebeye), pose a significant challenge to meeting future water needs. The country has made only limited investments in water and sewage management and infrastructure. This is compounded by the typical constraints of small island nations in isolation, fragile natural variability, and a limited human, financial, and capital resource base. Furthermore, only until recently little attention has been paid to the potential effects of climate related extremes on current water resources, especially with regards to salt-water intrusion, which negatively affect the limited freshwater lens on some of the lower-lying islands and atolls. Water crises during El Niño driven droughts are becoming increasingly common on smaller and more remote northern atolls that rely primarily on rainwater and have limited harvesting capacity and high costs to serve from a centralized government. On the Majuro atoll, water supplies rely on the Laura freshwater lens and the airport runway catchment area, which pipes water to the city's principal reservoir. Rising temperatures could lead to increased evaporation from the reservoir, thus reducing already limited freshwater supplies. Hygiene and sanitation continue to be a concern and a particular challenge is to manage a sewage system without contaminating the ground-water lens. Already, some of the country's fresh-water lenses have been contaminated with brine. Some atolls in the north have also been left inhabitable from US nuclear testing during the last century, most famously Bikini Atoll. This has resulted in contaminated soils and subsequently the groundwater resources on some islands in RMI.

Figure 1 Map of the Republic of the Marshall Islands

2. Background

2.1. Geography

RMI comprises of two chains of 29 low-lying atolls and 5 islands, see *figure 1*, situated just north of the Equator in the central part of the Pacific Ocean, 2200 miles west of Hawai'i and 1600 miles east of Guam. The total land area is some 70 square miles (110 sq.km) in an Exclusive Economic Zone of some 750,000 square miles (1.2 mill.sq.km).

The average surface level of the land areas is about 7 feet (2.1m) above mean sea level, and soils are generally poor and overlying coral sand, limiting the Republic's agricultural base.

2.2. Climate

The climate in RMI is moist and tropical. The rainfall varies considerably from south to north with from an annual mean of about 130 inches (3,300mm) in the southern atolls lowering to about 60 inches (1,500mm) in the northern atolls.

The two most densely populated atolls Majuro and Kwajalein have a 'dry' season from around December to April and a 'wet' season from May to November, see *figure 2*.

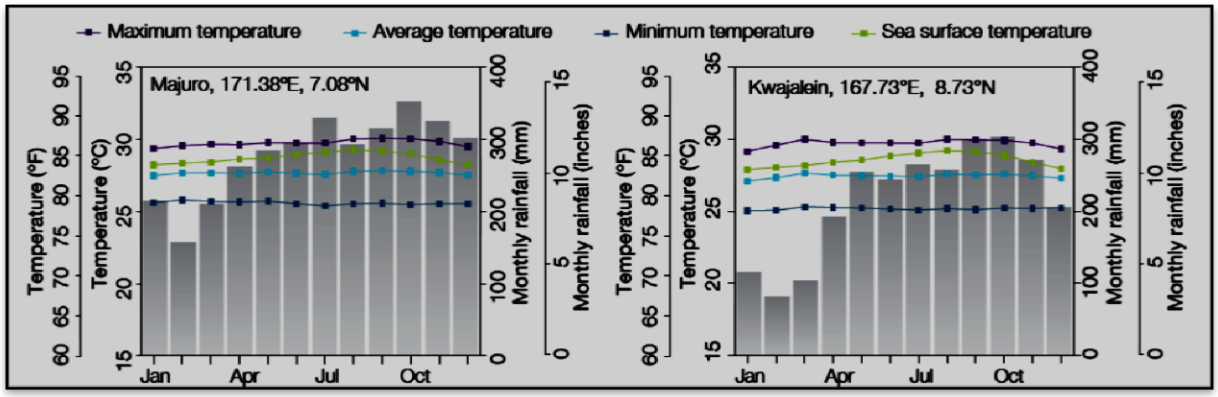

Figure 2; Average Annual Rainfall and Temperature Charts for Majuro and Kwajalein (CSIRO & Australian Bureau of Meterology)

The Intertropical Convergence Zone brings rainfall to the Marshall Islands throughout the year. This band of heavy rainfall is caused by air rising over warm water where winds converge, resulting in thunderstorm activity. It extends across the Pacific just north of the equator, see *figure3,* and is most intense and closer to the Marshall Islands during the wet season. Rainfall is also sometimes influenced by the West Pacific Monsoon, which brings wetter conditions when it is active over the Marshall Islands.

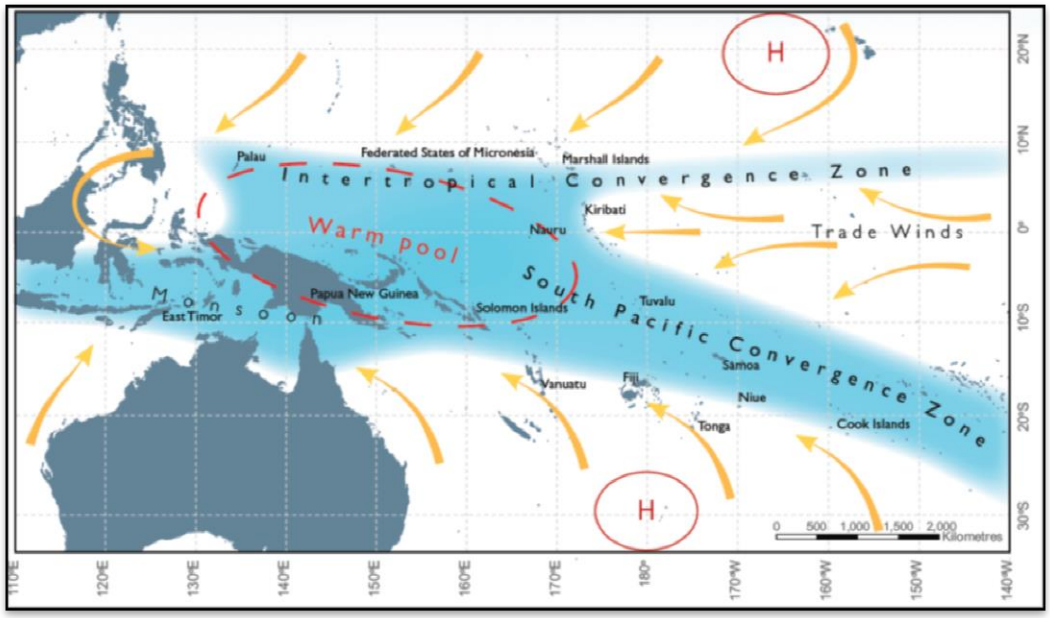

Figure 3; Intertropical Convergence Zone across the Pacific Ocean (CSIRO & Australian Bureau of Meterology)

The climate of the Marshall Islands varies considerably from year to year due to the El Niño-Southern Oscillation. This is a natural climate pattern that occurs across the tropical Pacific Ocean and affects weather conditions around the world. There are two extreme phases of the El Niño-Southern Oscillation: El Niño and La Niña. There is also a neutral phase. Conditions during La Niña years are generally wetter than normal. El Niño events tend to bring warmer than normal wet seasons and warmer, drier dry seasons, and there have been drought periods in which no significant rainfall has fallen for up to three months.

Typhoons, droughts and storm waves are the main extreme events that impact the Marshall Islands. Typhoons affect the Marshall Islands late in the typhoon season, between September and November. They are usually weak when they pass through the region, but are more intense in El Niño years. During an El Niño event the sea surface temperatures increase in and to the east of the Marshall Islands. This allows more intense typhoons to form.

2.3. Future Climate Predictions

Findings taken from the Pacific Climate Change Science Program Marshall Islands Report (CSIRO & Australian Bureau of Meterology)

TEMPERATURES WILL CONTINUE TO INCREASE

Projections for all emissions scenarios indicate that the annual average air temperature and sea surface temperature will increase in the future in the Marshall Islands. By 2030, under a high emissions scenario, this increase in temperature is projected to be in the range of 0.8 –1.8ºF (0.4–1.0°C).

MORE VERY HOT DAYS

Increases in average temperatures will also result in a rise in the number of hot days and warm nights, and a decline in cooler weather.

CHANGING RAINFALL PATTERNS

Almost all the global climate models project an increase in average annual and seasonal rainfall over the course of the 21st century. Wet season increases are particularly due to the expected intensification of the West Pacific Monsoon and the Intertropical Convergence Zone. However, there is some uncertainty in the rainfall projections and not all models show consistent results.
Droughts are projected to become less frequent throughout this century.

MORE EXTREME RAINFALL DAYS

Model projections show extreme rainfall days are likely to occur more often.

LESS FREQUENT TYPHOONS

On a global scale, the projections indicate there is likely to be a decrease in the number of typhoons by the end of the 21st century. But there is likely to be an increase in the average maximum wind speed of typhoons by between 2% and 11% and an increase in rainfall intensity of about 20% within 100 km of the typhoon centre.
The Marshall Islands is in a region where projections tend to show a decrease in typhoon frequency by the late 21st century, and a decrease in the proportion of the more intense storms.

SEA LEVEL WILL CONTINUE TO RISE

Sea level is expected to continue to rise in the Marshall Islands. By 2030, under a high emissions scenario, this rise in sea level is projected to be in the range of 1.2–6.3 inches (3-16 cm). The sea-level rise combined with natural year-to-year changes will increase the impact of storm surges and coastal flooding. As there is still much to learn, particularly how large ice sheets such as Antarctica and Greenland contribute to sea-level rise, scientists warn larger rises than currently predicted could be possible.

OCEAN ACIDIFICATION WILL CONTINUE

Under all three emissions scenarios (low, medium and high) the acidity level of sea waters in the Marshall Islands region will continue to increase over the 21st century, with the greatest change under the high emissions scenario. The impact of increased acidification on the health of reef ecosystems is likely to be compounded by other stressors including coral bleaching, storm damage and fishing pressure.

2.4. Demography

The just released *RMI 2011 Census* accounts for a population of 53,158 persons in RMI, 27,243 males and 25,915 females. The 1999 Census, revealed 50,840. The additional 2,318 people reflect a 0.4% population growth rate between censuses. Prior to the 2011 Census, there were projections that the RMI population would have 55,000 to over 60,000 people, but due to massive outmigration in recent years, it is estimated that around 11,000 Marshallese have left the country, mainly to the United States.
Majuro and Kwajalein (Ebeye) are the main populated atolls with a combined 73% of the total RMI population with 52% and 21% respectively. All outer islands' populations, except Jaluit, Lae, and Lib,

have decreased since the 1999 Census, indicating a flow from the outer rural atolls to the peri-urban atolls of Majuro and Kwajalein (Ebeye). To lessen in-migration pressure on the peri-urban areas there is a need to increase economic and employment opportunities in the outer islands, as well as improving the transportation and communication infrastructure, but indicators suggest that outer island development is not receiving the level of support necessary to achieve these goals.

2.5. Economy

The Marshall Islands were under German influence from 1899 to 1914, under Japanese influence from 1914 until 1944, and since then under the influence of the US, initially as part of the Trust Territory of the Pacific Islands until 1986, and latterly as a sovereign nation associated with the USA under a Compact of Free Association which defines political, military and economic relationships between the two nations. The United States will provide US$57.7 million per year to the RMI through 2013, and then US$62.7 million through 2023, at which time a trust fund, made up of U.S. and RMI contributions, will begin perpetual annual payouts, together with special compensation for Marshallese detrimentally affected by US nuclear testing.

Marshall Islands is still a mainly copra-based subsistence economy. Copra and coconut oil constitute 90% of exports. Tuna are also exported fresh for the Japanese sushi market. RMI has an great economic potential in marine resources with a 2.1 million km² exclusive economic zone rich in Skipjack and Yellowfin tuna and the potential mining of seabed mineral deposits. The tourism industry also has high potential and currently employs around 10% of the labour force.

3. Water and Sanitation Summary

3.1. Water Resources

The primary source of freshwater is rain which, because of the low elevation of the atolls and islands, soaks directly into the soil and disperses into the saltwater which permeates atoll subsoils. In some favourable locations some of the freshwater may accumulate in a lens which floats on the saltwater below and can be accessed with wells.

Rainwater collection systems, widely used in most water-short countries, are not well developed in the RMI. Existing legislation which requires new buildings to be provided with rainwater collection and storage facilities is not well enforced. With rainfall at 60 inches, a 100 ft^2 catchment would justify at least 1,600 gallons of storage, holding enough water for about 300 person-days of careful use in the dry season. However the cost of the storage tanks is seen as a large issue, especially in the outer islands.

On Majuro, water supplies rely mainly on the airport runway catchment area and are supplemented by the Laura freshwater lens, especially in times of drought. The water is treated and stored in reservoirs. There is little information on the quantity of water both extracted and contained in groundwater lenses. However recent attempts have been made to quantify the Laura lens on Majuro. Early results have shown that it is at risk of over-extraction, especially in drought periods, the times it is needed most. Research has shown that the lens does not fully recover to its full extent after prolonged droughts.

Seawater provides a limitless resource for either direct substitution of freshwater for certain uses, e.g. flushing toilets, or as a base for the production of drinking water by desalination. Ebeye's Municipal Water uses this method, and there are donor-funded projects that are preparing to install solar powered reverse osmosis units in some of the outer islands. Both these methods are expensive, and the community themselves are unlikely to purchase their own systems.

3.2. Water Supply & Usage

On Majuro Atoll, the average daily quantity available for distribution to the community is about 1 million gallons (3,700 m^3) produced both from a groundwater lens at Laura and from rainwater harvested from part of the paved area of the international airport. The reticulated water supply system is operated by MWSC, treatments include sand filtration and chlorination. Approximately 1,100 residential households are currently subscribed to the main water system, around one third of the total households. The other households mainly rely on rainwater harvesting methods.

According to the *2011 Census* most households rely on rainwater harvesting, especially for drinking with 79% surveyed claiming it was their major source, see *figure 4*.

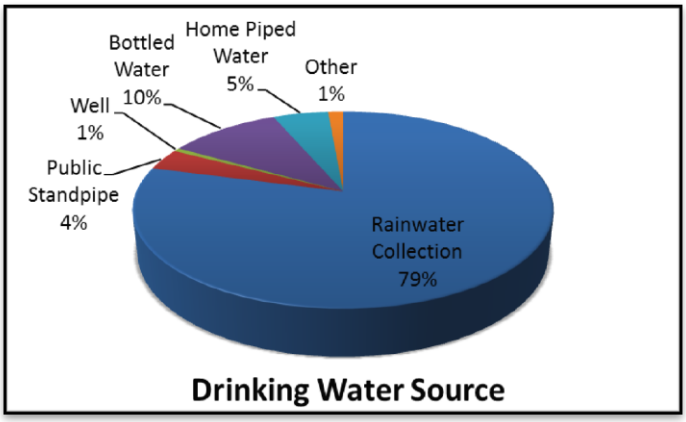

Figure 4; *RMI 2011 Census* results for Source of Drinking Water by Household

Ebeye's water supply uses two reverse-osmosis units with a maximum production capacity of 200,000 gallons per day (100,000 each). However only one of these units is currently in operation. Water is distributed via a reticulated water system with chlorination treatment. However only one in three households rely on this system as their primary source of drinking water. All other households who are not on this system must rely on rainwater harvesting or other means, including transport of potable water from the Kwajalein base, which accounts for the results for water access shown in *figure 5*.

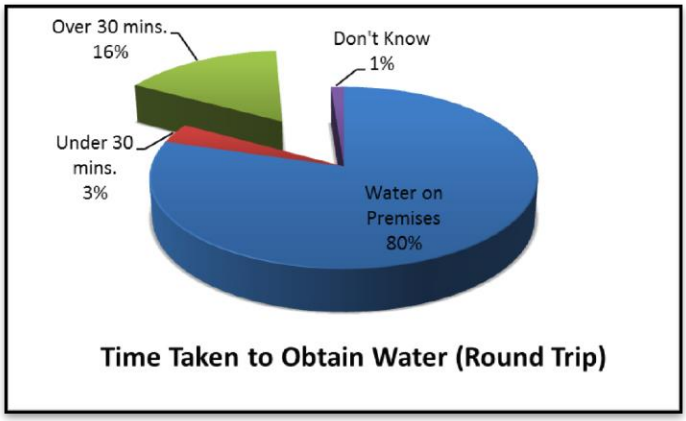

Figure 5; Time Taken to Obtain Water (Round Trip) (EPPSO, 2011)

On the Outer Islands rainwater is preferred by 76% of households supplemented when necessary by groundwater, 24% of households rely entirely on groundwater.

In spite of the fact that the naturally-occurring freshwater resources of the RMI are limited, the rainwater resource is considerably under-exploited, and supplies to individual consumers could be considerably enhanced if more attention was given to rainwater harvesting and storage.

The urban areas of Majuro and Ebeye are both supplied with seawater for toilet flushing and for fire-fighting.

Unrestricted water demand levels on Majuro are extravagantly high and would probably be similar on Ebeye if it were not for the fact that the output of the desalination plant limits freshwater use. An awareness campaign to increase public awareness of the need to economise on water use and to promote the use of water-efficient plumbing and sanitary fittings are urgently required. Promotion of rainwater collection and storage from all buildings throughout the RMI.

There is also a perception that much of the apparent high individual use of water is due to over-estimations of water production and to leaks in the reticulation pipework. Reliable bulk metering and a comprehensive leak detection survey is therefore required in both freshwater and seawater urban systems.

Of the household treatment methods for the treatment of drinking water only 52% were of improved methods, *ie.* boiled and bleach/chlorine usage, see *figure 6*.

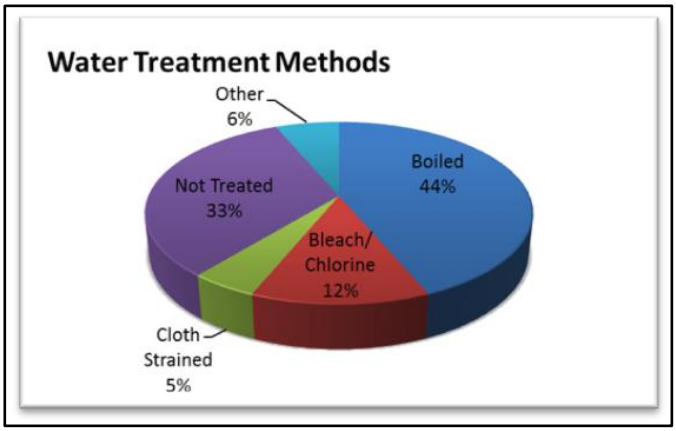

Figure 6; Household Water Treatment Methods for Drinking Water (EPPSO, 2011)

3.3. Sanitation

Saltwater is reticulated on both Majuro and Ebeye for the flushing of toilets, and both urban areas have a piped sewerage system terminating in an outfall to the sea.

In Majuro just over one-third of households use the saltwater reticulated sewerage system. However the majority of the households use septic tanks, even though they are required by law to be connected. The septic tanks also provide the potential overview and issue of how they are emptied and maintained with the utility now obtaining a pumping truck and charging around $500 for the empting service.

Ebeye also utilises a saltwater reticulated wastewater system. The system was first developed in the 1960s as a gravity sewer system and this still forms the bulk of the reticulation. The system includes an extended aeration loading treatment plant, however this plant is currently non-operational, instead untreated sewage is redirected into the lagoon via a 660 foot pipe.

Of the sewage outfalls, both have been storm-damaged or affected by land development so that sewage solids float to the surface and contaminate adjacent shorelines.

Families living on the Outer Islands are being encouraged to construct improved sanitary facilities rather than using the natural environment or the lagoon. Pit latrines are commonly dug as deep as possible to avoid frequent relocation, so most pits penetrate the groundwater table, and thereby pollute adjacent wells. Composting toilets as an alternative to pit latrines have been researched and developed in recently in Laura, Majuro as part of the IWRM Project, with other potential replication opportunities discussed.

Of the household sanitation facilities only 71% of households have improved sanitation facilities, see *figure 7*, this percentage is worse when just calculating for the outer islands with 51% with improved

sanitation. This figure is 37% with no facility, often with defecation occurring directly on beaches, fields and in the ocean.

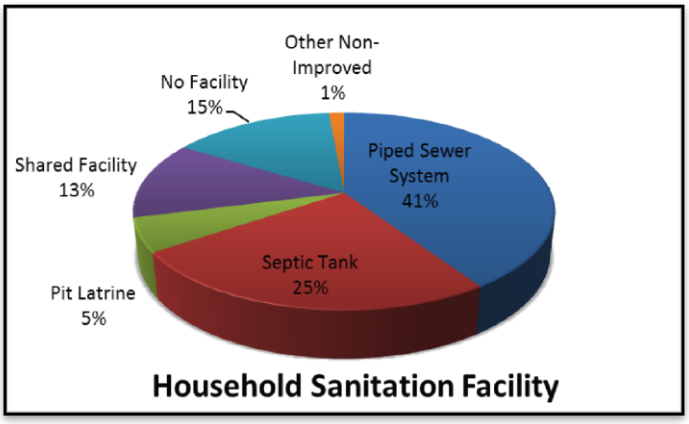

Figure 7; Total Household Sanitation Facility Methods; (EPPSO, 2011)

3.4. Water Quality and Health

Health statistics present an interesting picture in that the incidence of sanitation related and preventable diseases is higher in the urban areas of the RMI, with their piped water supplies and sewage disposal, than in the rural Outer Islands where there are no community water supplies or sanitation facilities. Overall, the health profile of Majuro is typical of a developing country, whereas that of the Outer Islands is typical of a country of moderate economic development.

The perception of health professionals is that the main causes of death are behavioural in character and that health education will have to be improved if the existing high rates of morbidity are to be reduced to an acceptable level.

3.5. Waste Disposal

Landfill sites are operated as reclamation areas adjacent to the urban areas, because of the shortage of land area in RMI. The landfills are in general poorly managed with no control on access and the mechanical equipment for spreading compacting and covering the garbage is frequently out of service.

In rural areas, each household makes its own arrangements for garbage disposal, sometimes in pits, but more frequently in the ocean.

The volume of garbage could be reduced by the recycling of recoverable materials, but distances from markets have seriously constrained the economics of recycling. Scrap steel in all forms from old car bodies to unserviceable earthmoving machinery litters the urban areas of the RMI and, even if the material has no commercial value, it should be removed, especially if the community is serious about the promotion of tourism. Waste oil and solvents could be removed by the oil importing companies for re-refining, but otherwise would require an incinerator for disposal.

A lack of effective stormwater drainage and subsequent pollution of stagnant water presents a real health risk. The poor drainage also leads to surface erosion, flooding of roads, and uncontrolled silt-laden discharges to the lagoon or the ocean.

3.6. Governance

RMI GOVERNMENT

The legislative branch of government consists of the Nitijela (Parliament). The Nitijela has 33 members from 24 districts elected for four-year terms. Members are called senators. The executive comprises the president and the cabinet. The president is elected by majority vote from the membership of the Nitijela and then selects the cabinet (currently ten ministers plus the president) from members of the Nitijela. There are four court systems: a supreme court and a high court, as well as district community courts and the traditional rights court. The thirteen-member Council of Chiefs (Iroij) serves a largely consultative function on matters of custom and traditional practice.

Ministries and offices of the RMI Government:

- Ministry of Education
- Ministry of Finance
- Ministry of Foreign Affairs
- Ministry of Health
- Ministry of Internal Affairs
- Ministry of Justice
- Ministry of Public Works
- Ministry of Resources and Development
- Ministry of Transportation and Communications
- Office of the Attorney General
- Office of the Cabinet
- Office of the Chief Secretary
- Office of the Council of Iroij (Chiefs)
- Office of Environmental Policy, Planning and Coordination (OEPPC)
- Office of the Nitijela
- Office of the President

SUPPORTING NATIONAL AGENCIES

OEPPC; Office of Environmental Policy, Planning and Coordination is the office responsible for climate change, environmental policy and planning and is located within the Office of the President. Its Minister is represented by the Minister in Assistance (Vice President).

EPA; The Environmental Protection Agency is responsible for pollution control, water quality monitoring and water and sanitation planning.

Weather Service; Marshall Islands National Weather Service Office provide short and long term weather forecasts and monitoring of atmospheric conditions coordinated with international weather organizations.

WUTMI; Women United Together, Marshall Islands. A RMI wide women's NGO network with chapters and clubs located on every inhabited atoll. Has great links to the Ministry of Internal Affairs and other agencies.

MICS; Marshall Islands Conservation Society is an influential environmental NGO who helped develop the Reimaanlok Community Based Management Approach

MIVA; Marshall Islands Visitors Authority actively promotes tourism and influential in waste management, climate change and sustainable development fields

MWSC/ KAJUR; Majuro Waste & Sewage Company/ Kwajalein Atoll Joint Utilities Resources are the water and sanitation service provider for Majuro and Ebeye

MIMRA; Marshall Islands Marine Resource Authority is influential in fisheries and coastal management practices and is taking a key role in developing Reimaanlok

MIMA; Marshall Island Mayors Association made up of all the Mayors of all 24 districts (atolls), important in the management of outer island affairs and management activities

ISLAND/ TRADITIONAL GOVERNANCE

The Chiefs (Iroij) are still considered to be the traditional rulers of the land and their resources. The Chief is a hereditary title and passed through to subsequent generations. The traditional leaders are powerful when it comes to land and resource management representing many of the land owners. The Chiefs also form a 13 member Council of Chiefs that plays a consultative role to the formal RMI Government. The Chiefs are also influential in atoll management through Mayoral Offices.

4. Policies and Institutional Landscape

This section provides an inventory of key policies related to water and sanitation management in the RMI and a summary analysis of the policy landscape and existing gaps (Part II). *Policy* as used here refers to any *officially* and *explicitly* articulated *government* position, plan, strategy, intention or course of action. This section also presents a picture of the existing institutional landscape and how water resources management is currently coordinated among the various players and through the recently established Water Task Force.

Existing policies that relate to water and sanitation management can be grouped into the following categories:

1. National laws
2. National regulations
3. National plans, strategies and policies
4. Local government ordinances
5. International conventions, treaties, and agreements

Note that numerous water-related studies and assessments have been conducted over the years. Because these are mostly diagnostic and do not officially and explicitly articulate government's policy or intentions related to water resources, most of them will not be included in this inventory.

4.1. Summaries of relevant national laws

NATIONAL ENVIRONMENTAL PROTECTION AUTHORITY (EPA) ACT

This act establishes the EPA, and outlines its power, functions and duties; establishes some procedures for environmental management (e.g. environmental impact assessments); establishes an environmental advisory council; establishes judicial proceedings and parameters; and articulates other matters related to the EPA and environmental issues. The act defines a public water system as a system for the provision of pipe-borne water for human consumption that has at least fifteen (15) service connections or regularly serves at least twenty-five (25) individuals, including: (i) any collection, treatment, storage and distribution facilities under the control of the operator of the system, which are used primarily in connection with that system; and (ii) any collection or pretreatment storage facilities whether or not under the control of such system, which are used primarily in connection with such system.
Under Powers of the Authority (section 121) the act enables EPA to make regulations, including for primary and secondary drinking water, pollutants, pesticides and other chemicals that may have harmful effects on the environment (including water sources), discharge of hazardous waste, and the preservation of historical, cultural or natural heritage. Section 122 provides more detailed parameters for primary drinking water regulations. Sections 123 and 124 provide more details on regulations for pollutants (including discharge of pollutants in to water) and pesticides. Part VII outlines EPA's enforcement powers, including for illegal discharge of any pollutant into water resources and for polluting, impairing or destroying the air, land or water, or other aspect of the environment. The act includes a short section (146) on the discharge of waste (which includes waste water or sewerage) and enforcement measures related thereto.

PUBLIC HEALTH AND SANITATION ACT

This act (also referred to as the Public Health, Safety and Welfare Act) provides for the health, safety and welfare of the people of the Republic through the establishment of health services, and control of sanitation, and related matters. The act outlines the duties of the Secretary of Health, whose main objective is to improve the health and sanitary conditions of the Republic, and gives the Secretary authority to promulgate regulations (across a wide range of areas) to better the public health and safety. Part II Sanitation, section 109, which relates to latrines and toilets and disposal of human excreta generally, states that: Latrines or toilets conforming to standards established by public health regulations shall be constructed and maintained in connection with each inhabited dwelling in the Republic. Depositions of human intestinal excreta in the vicinity of a dwelling or in or within five hundred (500) yards of any village in a place other than an approved latrine or toilet is prohibited. The act also identifies tasks that Ministry of Health is to undertake, including establishing standards for toilet construction

and maintenance, formulation food standards and conduct inspections, and setting standards for school sanitation.

PLANNING AND ZONING ACT

This act provides for: (a) planning in land water use; (b) the promotion of the health, safety and general welfare of the people; (c) the creation of zones in municipal areas in order to lessen the congestion and to secure safety from fire and other hazards; (d) the regulation and control of the construction of buildings and the prevention of overcrowding of land; and (e) matters connected therewith or incidental thereto. The act enables the RMI's Chief Planner to formulate land and water use policy in Majuro and other atolls. It calls for the establishment of a Planning Commission in all local governments and outlines the related roles and responsibilities of these commissions, including upholding the zoning principles stated in the act. Section 208 states that the local government Council may take into consideration in its planning and implementation program the necessity to establish and maintain catchment areas and water reserves for the collection and supply of water. Section 209 calls on every local government Council to make ordinances with respect to specifying the requirement of rain water catchment for every future construction of a house or for every building or industry where water is being used. This section also mandates that local ordinances shall require that all future constructions shall be equipped with a water catchment system to provide for a minimum of 500 gallons of rain-fed water storage to be collected from the roof area of the said house, building or industry. The act establishes six types of zones: residential, commercial, industrial, resort, public and watershed zones. Watershed zones are exclusively for the catchment, collection, storage and distribution of water. Part V calls for the adoption of a Marshall Island Building Code and provides guidelines related thereto. Section 223 states that the Building Code shall be designed to provide reasonably uniform standards and requirements for provision of water supply and sanitation to buildings consistent with intended use and occupation.

COAST CONSERVATION ACT

This act makes provisions for a survey of the coastal zone and the preparation of a coastal zone management plan; to regulate and control development activities within the coastal zone; to make provisions for the formulation and execution of schemes for coast conservation; and to provide for matters connected therewith or incidental thereto. The act establishes a Director of Coast Conservation and allows the General Manager of EPA (or anyone else who is suitable) to serve in this capacity. The Director is to conduct a coastal zone survey and formulate and execute schemes of work for coast conservation comprehensive Coastal Zone Management Plan, which shall include proposals for which deal with (among other issues) waste disposal facilities. The act also prescribes guidelines for permitting (e.g. for dredging). Section 320 instructs the Director to give directions for prevention or intrusion of waste or foreign matter into the Coastal Zone (which would include waste water).

DISASTER ASSISTANCE ACT

This act aims to reduce vulnerability of people and communities of the Republic to damage, injury, and loss of life and property resulting from natural or manmade catastrophes; to clarify the role of the

Cabinet and local governments in the prevention of, preparation for, response to, and recovery from disaster; to authorize and provide for coordination of activities relating to disaster prevention, preparedness, response, and recovery between agencies, and for matters connected therewith and incidental thereto. The act defines "disaster" as any occurrence or imminent threat of widespread or severe damage, injury, or loss of life or property resulting from any natural or manmade cause including but not limited to fire, flood, earthquake, wind, storm, wave action, oil spill, or other water contamination requiring emergency action to avert danger or damage, volcanic activity, epidemic, air contamination, blight, drought, infestation, explosion, or civil disturbance. The act outlines the powers of Cabinet to declare disasters and establishes a Disaster Committee, under the Chief Secretary, that is responsible for mitigation of the effects of any disasters for directing the conduct of counter-disaster operations. The Committee shall also prepare, for issuance by the Cabinet, executive orders, proclamations and regulations as necessary or appropriate in dealing with any disaster as well as a Disaster Plan. Importantly, the Disaster Committee is mandated to take specific disaster prevention measures, such as ongoing monitoring and conducting studies of disaster prevention methods.

OFFICE OF ENVIRONMENTAL PLANNING AND POLICY COORDINATION (OEPPC) ACT

This act establishes OEPPC as an advisory body to the RMI government on issues concerning environmental planning and policy. OEPPC also acts as the national focal point on all projects, programs, and negotiations related to environmental policies. Three units of OEPPC are established, each with a set of duties and responsibilities: the environmental policy and planning unit, the program coordination unit, and the data collection and analysis unit. The environmental policy and planning unit is responsible for duties such a preparing annual environmental reports and conducting vulnerability assessments. The program coordination unit is in charge of preparing monthly monitoring reports on all applicable projects and programs and other project/program management tasks. The data collection and analysis unit is responsible for data collection and analysis of subjects such as greenhouse gas emissions.

EDUCATION ACT

This Act establishes the Ministry of Education and articulates the government's overarching education policy. Part IV Division IV states that the Ministry shall promote the physical, mental, social and emotional well-being of students by providing instruction in positive health habits and attitudes, essential health services and a healthy school environment with adequate water and sanitation facilities.

4.2. Summaries of relevant national regulations

PUBLIC WATER SUPPLY REGULATIONS

These regulations, technical provisions and specifications establish certain minimum standards and requirements as determined by the EPA to be necessary for the public health and safety and to insure that public water supply systems and water supply sources are protected against contamination and pollution and do not constitute a health hazard. The regulations cover a wide range of areas and is-

sues, including: standards for pre-existing, new or modified public water systems; bottled water production; operation, maintenance and self-monitoring of public water systems; approved laboratories, reporting, public notification, record keeping and right of entry; variances; and supply of drinking water during emergencies. The final section details enforcement procedures.

RMI SUSTAINABLE DEVELOPMENT REGULATIONS

These regulations were proposed as part of an effort to implement the Coast Conservation Act 1988 (CCA) and the Nation Environmental Protection Act 1984 (NEPA). These regulations implement the CCA and NEPA by establishing standards, criteria, and permitting procedures for development activity throughout the Republic, having regard for the long term stability, productivity and environmental quality of the Republic so as to assure the sustainable development and preservation of the Republic's natural resources. In part, these regulations set forth criteria to determine which development activities require a Development Activity Permit. The major sections of the regulations deal with environmental permits, permit conditions, permit exemptions and criteria, and enforcement.

TOILET FACILITIES AND SEWAGE DISPOSAL REGULATIONS

These regulations set a minimum standard for toilet facilities and sewage disposal in order to minimize the environmental pollution, health hazards, and public nuisance from such facilities. The regulations cover rules and requirements for toilet and sewage facilities, permits, and disposition of sewage and excreta. Standards are also set for sewerage systems, septic tanks, privy and toilet facilities. Included are regulations on the maintenance and repair responsibilities of the owner of any toilet and sewage facilities. The regulations also prescribe the way in which EPA may enforce its power on those violating any of the regulations and requirements.

SOLID WASTE REGULATIONS

These regulations establish minimum standards governing the design, construction, installation, operation, and maintenance of solid waste storage, collection and disposal systems. Such standards are intended to: prevent pollution of the drinking and recreational waters of the RMI; prevent air and land pollution; prevent the spread of disease and the creation of nuisances; protect the public health and safety; conserve natural resources; and preserve and enhance the beauty and quality of the environment. Section 28 establishes standards for permitted landfills and prescribes guidelines for to protect and prevention contamination of water resources (e.g. ground water). Section 34 prescribes guidelines for proper landfill disposal toxic, caustic, volatile, and flammable chemical waste, stating that the waste shall be disposed of in a special trench or pit that is designed to retain the wastes and prevent infiltration into ground and surface waters. It also states that dewatered sludge from water treatment plants and dewatered digested sludge from waste water treatment plants shall be mixed with the other deposited solid wastes at the landfill to prevent localized leaching and that raw sewage sludge and septic tank pumpings are prohibited at all solid waste disposal facilities.

ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS

These regulations implement Part IV of the National Environmental Protection Act 1984 (NEPA) and Section 11 of the Coast Conservation Act 1988 (CCA) by establishing standard procedures for the preparation and evaluation of an environmental impact assessment (EIA) for proposed public and private development activities that may affect the quality of the environment of the Republic. These Regulations establish uniform standards under two Acts so that environmental scrutiny of proposed development activities may be streamlined and simplified. EIA's are intended to help the general public and government officials make decisions with the understanding of the environmental consequences of their decisions, and take actions consistent with the goal of protecting, restoring, and enhancing the environment. These Regulations are designed to integrate the EIA process into early planning of projects to ensure timely consideration of environmental factors and to avoid delays, as well as to identify at an early stage the significant environmental issues facing the Republic. The specific directions to achieve this purpose are contained in these regulations. Major sections of the regulations cover: preliminary proposals; EIA requirements; EIA format and content; review and approvals processes; regulatory permits and reports; and penalties and enforcement.

EARTHMOVING REGULATIONS

These regulations set standards for all earthmoving activities to prevent accelerated erosion, accelerated sedimentation, and disturbance of potential cultural resources. Earthmoving activities include dredging, quarrying, or construction operations and related activities. All persons engaging in any earthmoving activities are required to design, implement and maintain erosion control, sedimentation control, and cultural preservation measures which effectively prevent accelerated erosion, accelerated sedimentation, and adverse impact on cultural resources. The major sections of the regulations cover: erosion and sedimentation control plan, erosion and sedimentation control measures and facilities; cultural preservation measures; restoration; permits; and enforcement. Water resources, such as groundwater and any freshwater lakes, are also protected under these regulations. Section 9, covering projects involving water, states that if the project involves an earthmoving activity in a lagoon, or a reef, or any body of water, the EPA may require the plan to map and describe existing ecosystems, plants, animals, the coastal zone management boundary and coastal areas of special importance as well as maximum and minimum turbidities.

4.3. Summaries of relevant national plans, strategies and policies

VISION 2018

This is the RMI's Strategic Development Plan Framework for 2003 to 2018. It outlines some broad strategies and goals under many thematic areas. Under Infrastructure, it sets out two specific goals related to water: 1) To provide reliable and affordable infrastructure in the areas of communication, transportation, water and sewage, and energy; and 2) Enable all citizens to access clean and adequate water supplies as well as sustainable, affordable and reliable power supply.

ENVIRONMENTAL PROTECTION AUTHORITY STRATEGIC PLANS

The 2004-2007 strategy identified four strategic areas of focus, including Environmental Health and Water Quality. Under this strategic program area, EPA commits to goals and actions to improve quality of public water supply (in Majuro and Ebeye), community-based management of water supplies, marine water quality, sanitation, and food safety. The overarching goals under this strategic area are improved health of the community through increased access to safe drinking water and safe food and a clean marine environment safe for humans and marine life. The new strategy (2012-2014) identifies a new set of key areas, goals, objectives and implementing actions. Key Area 2 is the Water Quality Monitoring Program, whose mission is to provide water quality monitoring and healthy environment to all the communities in the RMI. The three objectives under this key area are two: 1) Ensure quality of public water supplies (Ebeye and Majuro); 2) Ensure continued education and training regarding community-based management of water supplies; and 3) monitoring of hazardous/wastes disposal, toilet and sewer facilities. Another key area is to continue efforts to promote community education and awareness, including on water and sanitation issues.

RMI INFRASTRUCTURE DEVELOPMENT AND MAINTENANCE PLAN (IDMP)

The IDMP is the government's main infrastructure plan and guides allocation of resources to specific capital projects. The IDMP was developed in conjunction with the renegotiated Compact which came into effect in FY 2004. Thus far, projects constructed under the IDMP have focused primarily on the education and health sectors, with education seeing the bulk of infrastructure spending. New facilities constructed have included water catchment facilities (e.g. new school buildings and classrooms have included rainwater harvesting and catchment systems) and basic sanitation facilities. In addition to this, separate moneys have been set aside (on occasion) for school water supply maintenance. Most existing public facilities built before the current IDMP period (e.g. schools, dispensaries, government offices) have basic water and sanitation systems in place, but many of these systems are in critical disrepair and in need of upgrading and maintenance, including public school water and sanitation systems.

RMI CLIMATE CHANGE ROAD MAP

The roadmap is based on an initial whole-of-government, inter-agency workshop held in August 2010. The main goals identified are to: 1) enhance the coordination and coherence of RMI's efforts to address the challenges posed by climate change; 2) inform the development and adoption of a RMI National Climate Change Policy by the end of 2010; and 3) in parallel, take advantage of the unique window of opportunity afforded by climate change fast-start finance for the period 2010 to 2012 (as captured in the Copenhagen Accord). The roadmap: provides guiding principles; outlines the institutional framework; discusses plans, programs and projects; identifies implementation clusters; and next steps. The roadmap incorporates many water-related issues, including prioritizing water security, indicating that climate change adaptation should: address substantial leakage/waste/evaporation (an immediate issue); address failing and climate-exposed infrastructure (such as underground pipelines); and consider desalinization potential.

RMI NATIONAL ACTION PLAN FOR DISASTER RISK MANAGEMENT (NAP-DRM) 2008-2010

The plan begins by describing the risk context and existing disaster risk management arrangements. It presents the national action plan (NAP) matrix and implementation program over the period, including cost estimates, financing strategy, communications strategy and monitoring and evaluation. Contamination of water supplies is considered a key risk factor identified. Among the key factors contributing to RMI's high risk profile are its limited and fragile fresh-water resources that are highly vulnerable to over-use and contamination. Weak management systems for solid waste and waste water are considered a threat to (among other things) water resources. Among the 10 main goals identified in the NAP is the goal of *access to safe and adequate clean water at all times (goal #5).* Under this goal, the plan states that the main objectives will be to: strengthen national coordination mechanisms; improve technical capacity and management of water utilities; reduce contamination of ground and surface water resources; strengthen capacity to reduce risk from water shortages resulting from hazardous events; and raise public awareness about water related risks.

JOINT NATIONAL ACTION PLAN FOR CLIMATE CHANGE ADAPTATION AND DISASTER RISK MANAGEMENT (JNAP)

It is proposed that this JNAP will absorb the previous one (NAP-DRM) and the draft results matrix for this plan presents the major goals as: 1) establish and support an enabling environment for improved coordination of disaster risk management/climate change adaptation in the Marshall Islands; 2) public education and awareness of effective DRM/CCA responses from local to national level; 3) enhanced emergency preparedness and response at all levels; 4) improved energy security, working towards a low carbon future; 5) Enhanced local livelihoods and community resilience; 6) integrated approach to development planning including consideration of climate change and disaster risks. Under goal five, one of the outcomes sought is to reduce vulnerability to water and food related hazards and shortages resulting from hazards and climate change impacts. Many of the same objectives in the NAP-DRM are incorporated into this JNAP-CC-DRM.

RMI MINISTRY OF HEALTH STRATEGIC PLAN 2012-2014

The plan is a three year revolving plan that replaces the previous five and fifteen year plans. The plan articulates overall policy statements, objectives, outcomes, and implementing actions. The seven key results areas are: Primary Health Care Services; Majuro Hospital; Ebeye; Administration and Financial Services; Planning and Statistics; and Referrals. Under key area one (primary health) one of the implementing actions is for the Mobile team to conduct education on public health issues including hygiene, general cleanliness, exercise, diet and water issues. To reduce the incidence of gastro-enteritis, the plan calls for the development of IEC materials on clean drinking water, human wastes and garbage hazards.

4.4. Summaries of relevant international and regional agreements

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

Also known as the Biodiversity Convention, the CBD is an international, legally binding treaty. Its three main goals are: conservation of biodiversity; sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources. CBD tries to support development of national strategies for the conservation and sustainable use of biological diversity. It is widely considered to be the key document on sustainable development.

UN CONVENTION TO COMBAT DESERTIFICATION (UNCCD)

The UNCCD focuses on countries that experience severe droughts and/or desertification. It provides measures to combat desertification and mitigate the effects of drought through national action programs and long-term strategies supported by international cooperation and partnerships.

UN FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC) AND THE KYOTO PROTOCOL TO THE UNFCCC

UNFCCC is an international environmental treaty produced during the UN Conference on Environment and Development (UNCED) (also known as the Earth Summit) in 1992. Its main objective is to stabilize greenhouse gas concentrations in the atmosphere to prevent dangerous anthropogenic interference with the climate system. UNFCCC does not set mandatory limits on emissions and has no enforcement mechanisms (it is legally non-binding), but it provides for "protocols" for setting mandatory emission limits, such as the Kyoto Protocol (1997) which established legally binding obligations for developed countries to reduce emissions.

UN MILLENNIUM DECLARATION AND THE MILLENNIUM DEVELOPMENT GOALS

The declaration establishes a common framework for development, focused on the most prominent contemporary development challenges. The declaration establishes Millennium Development Goals (MDGs) which are time-bound, quantified targets for addressing extreme poverty and related issues (income poverty, hunger, disease, lack of adequate shelter, etc.). Goal 7, Ensuring Environmental Sustainability, includes four specific targets, one of which is to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

UN BARBADOS PROGRAM OF ACTION AND MAURITIUS STRATEGY

More commonly referred to as the Barbados Program of Action (BPOA), this policy document: addresses the economic, environmental, and social developmental vulnerabilities facing small island development states (SIDS); and outlines a strategy to mitigate SIDS vulnerabilities. The Mauritius Strategy for further implementation of the BPOA which came out of the UN Conference on Small Islands in 2005 (and which covers the period 2005 to 2015) emphasizes and establishes strategic measures to deal with SIDS vulnerabilities in relation to the intensity and frequency of natural and environmental disasters and their increasing impacts.

THE MICRONESIAN CHALLENGE

This is a regional inter-governmental initiative for the effective conservation of marine and terrestrial resources in Micronesia. First proposed in 2005 by Palauan President Tommy Remengesau, Jr. the initiative calls for the conservation of 30 percent of near shore coastal waters and 20 percent of forest land by 2020. Palau, FSM, RMI, Guam, and CNMI have joined the initiative, representing nearly five percent of the marine area of the Pacific Ocean.

UN 64TH GENERAL ASSEMBLY RESOLUTION ON THE HUMAN RIGHT TO WATER AND SANITATION

In the 2010 UN General Assembly, 122 nations declared the right to safe and clean drinking water and sanitation as a human right, essential for the full enjoyment of the right to life. The resolution encourages the international community to increase efforts to provide safe, clean, accessible and affordable water and sanitation for all. RMI and many other Pacific nations were absent during the vote on the resolution.

4.5. Local Government Ordinances

Due to poor recordkeeping in both local governments and in the National Government, accessibility to local government ordinances is a major problem. At the moment, there are no known local government ordinances that have direct relevance to water resources or sanitation. Nonetheless, efforts by the Water Task Force and EPA will continue in order to fully assess all local ordinances and to determine which (if any) are relevant to water resources management in the RMI.

4.6. The Institutional Landscape

At the national level, the National Water Task Force (NWTF) serves as the interim water and sanitation coordination body. Established in 2008 via Cabinet resolution, the NWTF has a general mandate of safeguarding freshwater resources in the RMI.

5. Programs

Programs	Stakeholders	Project Description
Integrated Water Resource Management Project (IWRM)	Funding: GEF Implement: SPC-SOPAC Local: RMIEPA Contact: Mr Julius Lucky tupaclolo@hotmail.com	The RMI IWRM Program aims to promote best water management practices through a demonstration project to protect the Laura groundwater lens through better integration of the community and introduce sustainable management practices like water monitoring programs, dry-litter piggeries and composting toilets. The program also aims to assist in national water governance mechanisms. (Until end of 2013, likely 5 additional years)
European Union Envelope- B: Water Supply	Funding: EU Implement: SPC-SOPAC Local: Chief Secretary's Office Contact: Mr Kennedy Glanry kennysunshine@hotmail.com	The overall objective of this project is to improve the reliability of dry season and drought-period water supply to the urban and rural people of the Marshall Islands. The specific components of the project include: - Outer island household rainwater harvesting provision, 173 tanks provided - Urban rainwater harvesting provision, Majuro 350 tanks & Ebeye 250 tanks provided - Improved rural and urban rainwater harvesting management, roof catchment improvements and a 2000 gallon water truck provided - Improved drought yield of national airport runway rainwater harvesting, clear sediments from airport catchment tunnels - Protection of Majuro's groundwater resources for future drought supply, 2000 gallon septic pump truck provided (Recently completed)
Japanese International Research Center for Agricultural Sciences Laura Groundwater Study (JIRCAS)	Funding: Japan Implement: JIRCAS Local: R&D Contact: Mr Henry Capelle kikurto@yahoo.com	The JIRCAS program is centred around a detailed scientific study of the Laura groundwater lens, and effective use of water resources in regards to sustainable agricultural practices. They are also developing solar water purification methods. (Until end of 2014)
Sustainable Land Management (SLM)	Funding: GEF Local: OEPPC Mr Ned Lobwij nedlobwij@gmail.com	The SLM program is a small grants programme aimed at building capacity and coordinating efforts at the grassroots level. Activities have included holding environmental festivals, developing plant nurseries and coastal rehabilitation programmes. (Recently ended, extension likely through 5-STAR funding)
PAC-TAM Water Professional	Funding: AusAID Local: MWSC Mr Nigel Deacon Nige.deacon@gmail.com	*Mr. Nigel Deacon* is an AusAID funded engineering consultant based at Majuro Water and Sewage Company, his main aim is coordinating their works and planning their supply systems. He is a member of the Water & Sanitation Policy sub-committee. (Finishes Sept. 2013, funded for additional 12 months)

Programs	Stakeholders	Project Description
Land Grant Extension Officer	Funding: US Local: CMI Mr Jina David Jinana76@yahoo.com	*Mr Jina David* from the College of the Marshall Islands visits the outer islands as part of the RMI 'Mobile Teams' and works within the community in Majuro, he educates the community on water and climate related issues. He also teaches them about water testing and takes some samples that are brought back to EPA in Majuro for testing
Water for Life	Funding: US Implement: PREL Local: MoE Ms Evelyn Joseph josephe@prel.org	Regional Education Programme run out Hawai'i, aimed at teaching Grade School students about Water, focus on Majuro only. Details yet to be finalized, but likely to include visits to IWRM field unit in Laura and the EPA Office to learn about Water Quality Monitoring.
Pacific Island Forum Secretariat- Renewable Energy	Funding: Japan Implement: PIFS Local: R&D Contact: Mr Henry Capelle kikurto@yahoo.com	15 Solar Powered Reverse Osmosis Water Purification Units to be set up on outer island communities, details of the exact plan of the program have yet to be developed.
Micronesia Challenge	Funding: *Various* Implement: MCT Local: CMAC Contact: Mr Albon Ishoda taishoda@gmail.com	Micronesia wide conservation initiative that enhances community resilience by using traditional knowledge and ecosystem strategies to conserve vulnerable coastal land resources by 2020; goals are to effectively conserve at least 30% of near shore resources and 20% of terrestrial resources. Funding the trust account has been problematic and any funds will not likely be retrieved until after 2020. Funds have been planned to be used on the future ongoing activities of the Reimaanlok Community Based Management Planning. (Ongoing)
Pacific Australian Climate Change Science Programme and the Pacific Adaptation Strategy Assistance Programme (PACCSAP)	Funding: AusAID Implement: CSIRO/BOM Local: OEPPC Contact: Mr Bruce Kijiner bruce.kijiner@ntamar.net	PACC-SAP are providing climate change projections, analysis and adaptation planning activities for RMI. Agencies responsible are: AusAID; Australian Department of Climate Change and Energy Efficiency; Australian Bureau of Meteorology, Commonwealth Scientific and Industrial Research Organisation, RMI National Weather Service Office (Report Completed)
Pacific Adaptation to Climate Change (PACC)	Funding: GEF Implement: SPREP Local: OEPPC Contact: Mr Joe Cain Jsphcain4@gmail.com	The PACC Program will implement long-term adaptation measures to increase the resilience of the water sector in the RMI to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. With components including Water Policy Production, Laura Lens Protection, Airport Rain Catchment Upgrade. (Until end of 2013, an extra 5 years has been funded by AusAID, known as PACC +)

Programs	Stakeholders	Project Description
SPC Global Climate Change Alliance-Pacific Small Island States Program (SPC GCCA PSIS)	Funding: EU Implement:SPC Local: OEPPC Contact: Ms Pasha Carruthers pashac@spc.int	The GCCA Program will implement long-term adaptation measures to increase the resilience of coastal environments in RMI to the impacts of climate change. The program aims to focus its resources on Ailinglaplap Atoll. (Until end of 2014)
Global Climate Change Alliance-USP (GCCA-USP)	Funding: EU Implement:USP Ms Tamara Greenstone-Alefaio tgreenstone@gmail.com	Vulnerability assessments initially for six atolls, then decide on small scale climate adaptation measures to fund. The main focus is on educational development and enhancing local student capabilities to learn the assessment process through the University of the South Pacific. (Until end of 2014)
North Pacific Renewable Energy Program (North-REP)	Funding: EU Implement: SPC Local: R&D Contact: Mr Rupeni Mario rupenim@spc.int	The main objective of North-REP project is to improve the quality of life and decrease the use of fossil fuels in RMI. It aims to improve energy efficiency, access to affordable, safe, clean reliable, and sustainable electricity supply. Under North-REP, close to 1500 homes in 15 outer islands and atolls in RMI will be installed with solar home systems. (Until end of 2014)
Coping with Climate Change in the Pacific Island Region (CCCPIR)	Funding: BMZ Implement: GIZ & SPC Local: EPA Contact: Mr Fenno Brunken Fenno.brunken@giz.de	In RMI the CCCPIR focuses on increasing the resistance to climate change of the water and sanitation sector. Proposed programs include developing a comprehensive GIS database of the Majuro water and sanitation network, as well as other activities including workshops and developing informational material.
GEF 5- System for the Transparent Allocation of Resources	Funding: GEF Implement: UNEP Local: OEPPC Contact: Mr Steve Why Stevewhy2@gmail.com	This $4.5M project is in the development phase, with Water Security, Food Security, Energy Security and Coastal Management all part of a programme based mainly around community based management and engagement activities in the outer islands. A further $1M can be added into the program from other GEF Programs (Sustainable Forest Management and Ridges to Reefs). (Until end of 2014)
Hybrid Mitigation, Relief and Reconstruction Programme.	Funding: US Implement: IOM Contact: Mr Kate McDermott kmcdermott@iom.int	The project aims to provide humanitarian relief and assistance for reconstruction and recovery following an extreme event or shock to Small Island Developing States. Moreover, together with USAID, IOM will work with the Government and communities to increase emergency response capacity as a disaster mitigation measure.
Climate Adaptation, Disaster Risk Reduction and Education Program (CADRE)	Funding: AusAID Implement: IOM Contact: Mr Kate McDermott kmcdermott@iom.int	The aim of the CADRE program is to build the resilience of vulnerable communities in the North Pacific to hazards and assist them to adapt to climate change through education and information delivery.

Table 1; RMI Water, Climate Change and Disaster Management Programs

6. Supported Development Activities Summary

6.1. Water & Sanitation Policy Development

PROCESS

In October 2012, the Policy Sub-Committee had just been re-established in order to complete the process of developing a draft National Water & Sanitation Policy. The document was in a rough draft form from the previous committee, and was put to the larger National Water Task Force in November for input and clarification on wording and content, see *figure 8*.

Figure 8; NWTF Meeting (Photo: IWRM)

With support from the SPC-GIZ CCCPIR program the draft Policy was then formalized and the greater consultation period with the community and with various agencies, government and significant groups commenced (see Annex 1). Also before the community consultation and the posting in the newspaper occurred the document had to be available to be viewed on the EPA website. Since the website was not active, it had to be recreated.

It was discussed with the SPC-GIZ CCCPIR consultant that it was important that a community figure be visible to the public on 'Water & Sanitation' issues to involve the community and to help the progression of the Policy. Many discussions were held with colleagues from various offices and the same name kept coming up as the ideal candidate to become the 'National Water & Sanitation Champion', existing influential senator and prominent traditional leader Mike Kabua, see *figure 9*. There had also been a 'Water Champion' in the past, being the former first lady Hannah Zedkaia, but has since become dormant. It was suggested having a male and female, and from opposing sides of politics that the longevity of these roles and their influence would benefit the water sector and would influence the ongoing success of the policy.

The translation of the policy into Marshallese was agreed to and is still in process.

Figure 9; Meeting with Senator Mike Kabua discussing becoming National Water & Sanitation Champion (Photo: IWRM)

ACHIEVEMENTS

- Senator & Iroij Mike Kabua becoming the National Water & Sanitation Champion to assist with the Policy through higher level consultations
- Further development of the Policy by the National Water Task Force and its Policy Sub-Committee
- Consultations with Chief Secretary, Mayor's Association, MALGOV, KAJUR, KALGOV and communities across Majuro and Ebeye, see *figures 10- 13*.
- Amendments to the Policy made by the National Water Task Force and Policy Sub-Committee from admissions made during consultation phase.
- Policy submitted to Cabinet, see A*ppendix 1*.

Figure 10; Community Policy Consultation at World Wetland Day (Photo: IWRM)

Figure 11; Meeting with KAJUR on Kwajalein Atoll (Photo: IWRM)

Figure 12; Laura Community Water Policy Forum Discussions (Photo: IWRM)

Figure 13; Senator Mike Kabua speaking at the Laura Community Water Policy Forum (Photo: IWRM)

LESSONS LEARNT

There were no responses from the public from any form of consultation that involved one on one contact. Whether that is from placing an advert in the newspaper, looking at the website, coming into the office, listening to the radio or handing out brochures at various events. A consultation with a community where people were interviewed door to door to attend a group discussion was not successful. More success did come when high ranking officials and support from numerous agencies occurred.

6.2 World Water Day Organization

PROCESS

With support from the SPC-GIZ CCCPIR consultancy the first World Water Day organizational meeting occurred on Thursday 31st January, seven weeks out from the event itself. Various agencies and organizations who all work around water were gathered to help organize activities for the day. The attendees came from the agencies and programs of EPA, IWRM, OEPPC, PACC, MWSC, PREL and CMI-Land Grant. Various options around different activities for schools, communities, media involvement, political involvement, and lead-up events were discussed. An ambitious agenda for the day was set out that centred on the anticipated signing of the National Water & Sanitation Policy by the President. However, the signing was postponed, and alternative arrangements were made.

ACHIEVEMENTS

- World Water Day Presidential Statement, see *appendix 5*, given in front of over 100 people and broadcast across the atoll over radio.
- Two World Water Day Walks occurred one down through the main street in town escorted by local and national police from the International Convention Centre to the Marshall Islands Middle School. The second was at the other end of the atoll at Laura, where local citizens walked around the village in a loop, *see figures 14 & 15.*
- The walks were registered with the 'International Walking for Water' campaign, including 250 backpacks for the students taking part in the walk.

Figure 14; RMI President Loeak with students at the start of the walk (Photo: PACC)

Figure 15; Students taking part in the International Walking for Water Walk (Photo: PACC)

LESSONS LEARNT

Some parts of the extended program were not carried out because of unforseen events like e.g. broken audio facilities. For future planning of similar events it is recommended that a local organization or agency needs to take the lead about promoting such an important event.

6.3 Educational & Informational Materials Development

PROCESS

The SPC-GIZ CCCPIR program supported the development of signs jointly with the IWRM Program for their community awareness centre in the Laura Community to showcase their activities and inform the community about the importance of taking care of the environment and in particularly their ground-water resource. They had already developed a sign for their dry-litter piggery and eco-sanitation toilet displays and further designs were developed for a recreational sites water advisory sign, *appendix 6,* that would inform the community of coastal sites that are safe for swimming at, but also advise the community on the various sources of water pollution contributing to the poor water quality in places. The idea of this sign comes from already existing signs developed by the EPA in Pohnpei and have been proven to be quite effective in engaging the community.

Jointly with the IWRM Program a series of informational materials were developed by the SPC-GIZ CCCPIR consultant on various aspects around their works to showcase for World Water Day and within their planned educational centre at Laura. The series includes the titles *Composting Toilets, Dry Litter Piggeries, Rainwater Catchments* and *Water Conservation (*see *appendix 7).* The series were also developed so that they could potentially be used in other participating IWRM Project countries. Various drafts were developed jointly with the IWRM staff but also with the EPA's Education and Information Division Chief. The content originally involved more text, and it was decided more photos and images were needed to engage the reader's interest.

During February an emergency meeting was held by various agencies (IOM, MWSC, OEPPC, MICS & EPA) to discuss what can be done to inform the public on the growing concern of an extended dry period and threat of drought on Majuro but even more on the Outer Atolls. Majuro's water storage at that stage held around three to four days of water supply. It was discussed to develop a campaign to inform the community on ways to conserve water. The result of the meeting was five key points that were short and clear and could be delivered in numerous methods like posters, radio messages and others. From these 5 key points a poster in English, and then translated into Marshallese language version were developed, see *appendix 8*. These posters were printed large scale on the map printer and presented to the outer islands on various field trips as well as posted in stores around Majuro town.

The IWRM information sheets developed at an earlier stage were seen as not suitable for young students so it was thought to develop a series for them to recognise how and why water is important to them. It was decided to develop three sheets; one on clean water, one on saving water and one on toilets. Simple posters were developed on the topics of household water treatment, hygiene / hand washing and sanitation methods, see *appendix 9*. These were screened by the EPA's Education Division to check if they were cultural appropriate for the Marshall Islands.

During the development of the Water & Sanitation Draft Policy the policy needed to go to the public for consultation. In order for the Water and Sanitation Policy to be viewed by the public, EPA needed an active website so the document could be posted and subsequently downloaded and viewed.

The website is online available at www.rmiepa.com, and includes various EPA's news and events, including the posting of the draft National Water and Sanitation Policy as shown in *figure 16*. The EPA website is also a useful tool to post other informational material that has been developed on water and coastal resource management and other climate change related documents.

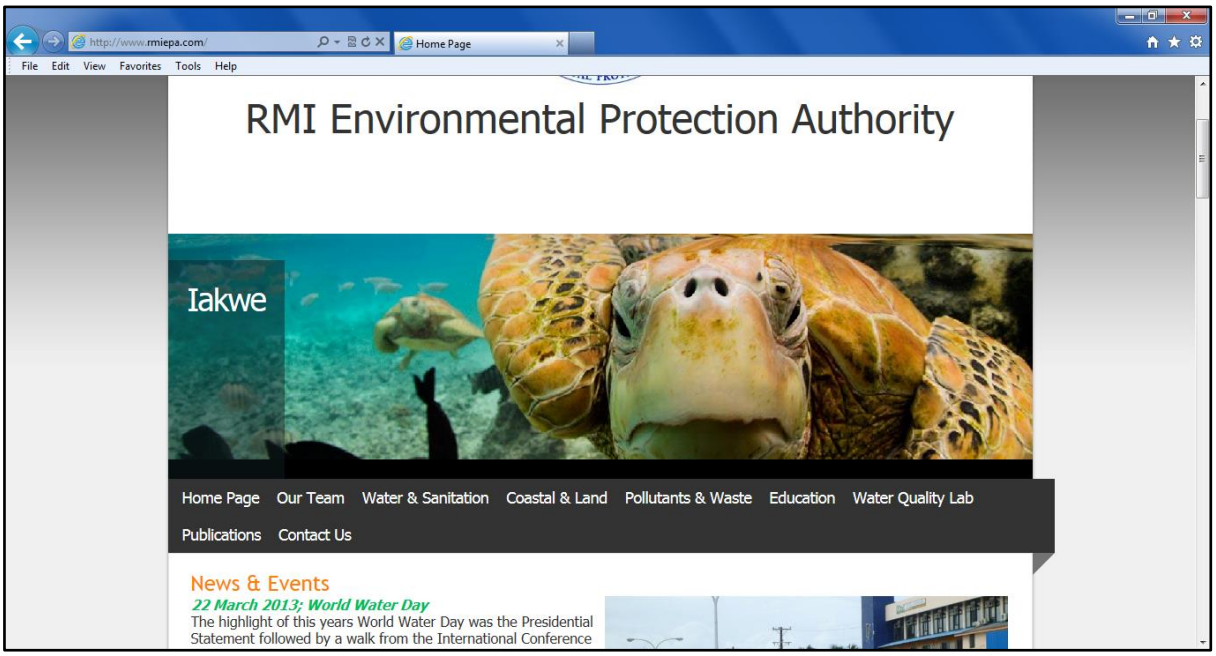

Figure 16; The new RMIEPA.com Website that has been developed

ACHIEVEMENTS

The following results were achieved during the six months SPC-GIZ CCCPIR consultancy:

- The 5-steps water conservation posters in both English, and Marshallese, have been posted all around Majuro town as well as been shown all around the outer atolls. The posters were also printed in A4 form for distribution to the schools as part of World Water Day activities.
- The other posters on household water treatment, hygiene/handwashing, and sanitation methods were also printed in A4 form for the distribution to the schools as part of World Water Day activities.
- The IWRM information sheet series was completed and distributed to schools and attendees of the World Water Day Presidential Statement, the sheets are also present in the EPA foyer for the public for display and to take away.
- The EPA website has been developed and has been maintained, adding various news and articles over the months since it was launched. It has been paid for another 18 months.

LESSONS LEARNT

The translation of information material was a challenging process as the Marshallese language has gone through many spelling and grammatical changes over the last few decades. Also the process was long and more complex then expected. However the process of translating informational material into Marshallese maintains an important step in communicating to the wider community and students.

7 Strategic Direction of Future Works & Programs

OUTER ISLANDS

Drought is extremely common in the outer atolls and reverse osmosis units are essential for the ongoing water needs of the population. Diesel has been traditionally used but especially the transport of the fuel has proven to be very expensive and scarce so there is high need for the reverse osmosis units to be solar powered, a Japanese funded program aims to deliver 15 more solar-powered reverse osmosis units to the outer atolls in the near future.

A drought has recently been declared for the outer northern atolls where rainfall is predominately lower, the US through their IOM implemented program are supplying emergency reverse osmosis unit for the most in need atolls.

There is also a need to supply additional rainwater harvesting tanks, with the possibility of using community catchment systems, e.g. for schools, churches and medical dispensaries. Inter-island transfer mechanisms need to be researched as a possible form of water distribution. Groundwater lenses need to be researched more thoroughly to provide guidance on their extraction capabilities.

Key to the drought resilience on the outer atolls is having coconut palms that are abundant and not senile. The planting of numerous coconut palms in the outer atolls will not only enhance food security but also provide a drinking source in times of extreme drought. Many atoll communities would not survive without this resource. But many of the current palms are becoming senile and there is a need for a coordinated planting effort on the northern atolls that are extremely prone to drought conditions. The new GEF 5 STAR Program's Sustainable Forest Management Section aims to do just that, with money been provided for the replanting of coconuts on outer atolls.

MAJURO

Majuro needs to focus on the public system with improving leakages and regulating illegal connections. The price of water needs to be recovered from delivery and needs to stay low to enable its affordability to the public. Creating new and more expansive storage public network creates extra operational and maintenance costs that has to be passed on to consumers. The SPC-GIZ CCCPIR Concept, see *appendix 2*, that has been developed hopes to create a comprehensive GIS database that covers Majuro's Water and Sanitation infrastructure systems. By using the GIS tools developed creating a future capacity and capability of successfully managing water flow monitoring, infrastructure maintenance, water quality monitoring, environmental regulation, water and sanitation policy activities.

EBEYE

Ebeye has many current funding options available, including a $15- 20M AusAID proposal, but needs to urgently develop a consistent, reliable supply of both water and sanitation services. Currently the utility company KAJUR is neither charging the public for water supply or sanitation services, but for the

long-term sustainability for the utility company it is required, and is also a requirement stated in the developed National Water & Sanitation Policy.

ACTION & INVESTMENT PLAN/DIVISION OF WORKS

One of the major outcomes of the Water and Sanitation Policy will be the Water and Sanitation Action & Investment Plan. The plan will identify the key activities from the Policy and sets out how and who will carry out the activities. The plan will cover an initial 5 year period that will cover the life span of many of the current and proposed donor-funded programs. The infrastructure part of the plan will identify the key funded projects, the potentially funded as well as yet to be funded projects that are required within the 5 year period of the Plan. It is a requirement of the IWRM Project work-plan that the Water And Sanitation Action & Investment Plan is completed by the end of 2013.

WATER & SANITATION OFFICE

The draft Water and Sanitation Policy highly encourages the official establishment of a National Water and Sanitation Office and its permanent staffing occurring within 6 weeks of the document being signed. This in order to help develop the above mentioned Action & Investment Plan for the activities of the Policy and to coordinate sector programs and investments.

The proposed structure of the Office would require at least one permanent RMI Government funded staff member to manage and be responsible for the policy and sector planning. This position currently exists in the official EPA structure however the position due to funding issues has never been filled.
It is recommended that an additional RMI Government funded staff member is employed to focus on Community-level activities. Other members of the Office could be members of various donor funded programs focussing on water and sanitation, including the planned assignment of the SPC/GIZ Development Worker.

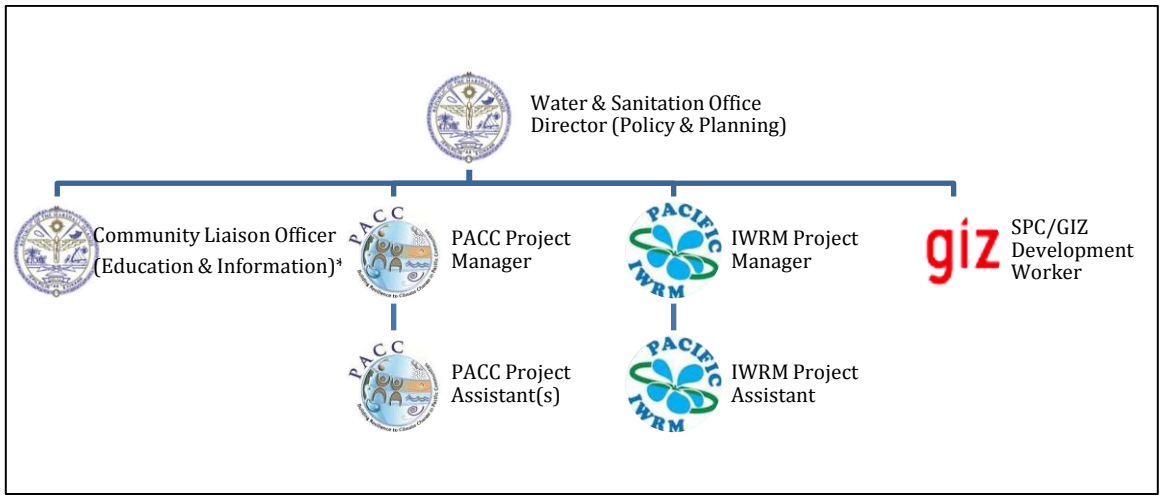

Figure 17; Proposed Water & Sanitation Office Structure as suggested in the Policy document

The permanent location of the Water & Sanitation Office is still unclear however it will be the RMI Government's prerogative to determine the location of the Water & Sanitation Office, most likely within EPA for now until the planned Department of Environment, Energy and Conservation is developed

later in 2013. It has been recommended in the development review of the new Department that it should take the current policy and planning activities of EPA, this would most likely include the proposed Water and Sanitation Office.

COMMUNITY-BASED WATER COMMITTEES & ATOLL MANAGEMENT PLANS / REIMAANLOK'S INTEGRATED MANAGEMENT APPROACH

A key to the ongoing management and resilience of outer atolls and communities is development of community-based water committees who develop management plans for their own atolls. Reimaanlok's integrated management approach to working with communities in conserving land and marine environments has shown how successful this process can be within the Marshall Islands. Atolls like Namdrik have also gone through the process of Reimaanlok that also included developing committee and a water management plan as part of that process. The committees are represented by the area's population, landowners, water users, traditional leaders, local government and national authority providing strong community participation to the process. The water committee can form part of a Reimaanlok Land Resource Committee with a mandate to establish and manage an integrated water resource plan and directs actions that are needed to be taken.

CLIMATE CHANGE ADAPTATION

The National Climate Change Committee, the stakeholder taskforce has recently been disbanded after a recommendation from the Climate Change Advisor. It is not clear if any such stakeholder taskforce will be re-established soon to replace it. As a consequence many of the donor-funded activities are struggling to get off the ground and the Draft JNAP for CCA & DRM has no coordination to follow through its proposed activities and workplan. Regional agencies such as SPC and SPREP have principally agreed to fund various climate change positions in the country but it is not understood what priorities or structure the various positions and advisors will take.

The organizing agency OEPPC needs to prioritize how and what they aim to achieve in the near future, this could be done through the development of the Draft JNAP-CC-DRM and its subsequent workplan. A new national committee on Climate Change also needs to be established soon that engages government and non-government stakeholders as well as incorporating on community participation. Greater transparency needs to occur on the priorities and the justification of various programs and activities.

There is the potential for many more donor-funded Climate Change Adaptation Projects occurring in the near future, and a clear workplan needs to be set out on how these projects will fit into a larger national strategy, whether that is water, energy, coastal or food security.

FURTHER SPC/GIZ CCCPIR PROGRAM CONCEPTS

Two other concepts have been developed for the SPC/GIZ CCCPIR Program during this short term consultancy. The first, see *appendix 10*, involves the enhancement of the already successful 'Adapting to Climate Change' educational tool developed for the Micronesian Challenge. This booklet/flipchart is an effective way of giving the region a consistent and comprehensible message of the causes and impacts

of climate change. This new 'water and sanitation module' aims to enhance the water resource and sanitation aspects that can be used in addition to the existing package. By understanding the impacts of what management decisions are made and how they impact the quantity and quality of water resources it enables actions to increases resilience to the future limitations of water under increased climate change conditions.

The second, see *appendix 11,* a workshop needs to be developed in order to build capacity of the teachers to run the new Ministry of Education and PREL Climate Change module that will be developed into the 8th grade curriculum at all schools across the Marshall Islands. Other agencies including IOM, OEPPC, RMIEPA, MICS and CMI Land Grant would be beneficial to attend this workshop in order to assist with the teachers in the curriculum but also to build their own capacities to inform outer island communities on all aspects of Climate Change. It is this climate change information to the next generation of Marshallese people on how and why climate change impacts their communities and environment that ongoing efforts on climate change resilience will be enhanced.

8 Conclusion

Integrated Water Management (IWM) is a systematic process of sustainable development, allocation and monitoring of water resource use in the context of social, economic and environmental objectives taking especially climate change adaptation and disaster risk reduction related aspects into account.

Integrated Water Management principles can be expressed very simply as the recognition that water is *'a public good with social, environmental and economic values, and that good water management requires both a broad holistic perspective and the appropriate involvement of the users at different levels*' (Lenton 2009, p7).

IWM processes are supposed to be collaborative, transparent and participatory with recognition of how complex water planning is with its many often conflicting values and uses.

The IWM process needs to be economically efficient to make scarce water resources go as far as possible and to allocate water strategically to different economic sectors of use. The social values require a gender balanced approach towards the access to water and to the benefits from water's use, between or across different social and economic groups which involves issues of entitlement, access and control rights. Whilst environmental values require ecological systems to be sustainable to protect the water resources base and their surrounding aquatic ecosystems, and more broadly to help address global environmental issues such as climate change mitigation and adaption, health, sustainable energy and food security.

There is a need for robust, flexible management systems especially when dealing with uncertainty and risk. There is compelling evidence throughout the world that climate change is already happening (IPCC 2007), and the expanding population creates greater demand on an ever dwindling water resources. Securing of these future water resource needs requires efforts to take a long term vision.

The Policy and concepts developed and supported during the SPC-GIZ CCCPIR short term consultancy set out many of the key IWM key values like stakeholder engagement, community participation, use of knowledge and information, valuing water, and long term planning. The Water and Sanitation Policy needs to be finalized and endorsed and the respective action plans have to be developed and implemented.

Community-based civil groups need to be further developed within all communities of the country especially with the many unique cultures and environments that exist from atoll to atoll. This needs to be the focus with the Mayors Association(MIMA), Women's Networks (WUTMI) and Youth Networks(Youth to Youth) being the key. Much work involves communication and planning within the communities, with strong figures leading the planning and driving actions taken within the communities. Government agencies should be there for assistance and the enabling of works to be done. The Reimaanlok Process is a successful and comprehensive suite of tools in engaging the community and allowing them to identify management issues and assist them in planning their own future with the assistance of best practice projects based on reliable scientific results. This process has been carried out on atolls like Namdrik, where a strong Senator (Matt Zachras) has led the way. This has resulted in

Namdrik winning an international award for environmental management with having now a RAMSAR listed protected wetland as well as developing economic opportunities within the community with a successful black pearl farming industry. This progress also makes it visible and attractive for other donor programs to back onto this progress with the knowledge of a community that has the leadership and support to follow through with various activities.

The inclusion of various and additional stakeholders, as well as bottom-up consultation processes, may further strengthen the implementation of the National RMI Water and Sanitation Policy.

References

Census. (2010). Republic of the Marshall Islands. Economic, Planning and Statistics Office.

CSES. (2006). *Community Socio-Economic Survey.* Republic of the Marshall Islands, Economic Policy, Planning and Statistics Office.

CSIRO & Australian Bureau of Meterology. (n.d.). *Australian Bureau of Meterology, CSIRO. (2011). Climate Change in the Pacific;Assessment and Research. Volume 2: Country Reports :Republic of Marshall Islands.*

DHS. (2007). *Demographic and Health Survey 2007.* Republic of the Marshall Islands, Economic Policy, Planning and Statistics Office. SPC and Macro International Inc.

EPA. (2006). Environmental Protection Agency, Republic of Marshall Islands.

EPPSO. (2011). *The RMI 2011 Census of Population and Housing.*

HWS. (2010). *Majuro and Kwajalein Atoll Household Water Survey.* Republic of the Marshall Islands, Economic Policy, Planning and Statistics Office.

KAJUR. (2011). Kwajalein Atoll Joint Utility Resources, Republic of the Marshall Islands, Ebeye.

M., L. R. (2009). *Integrated water resources management in.*

MWSC. (2011). *Water Distribution Schedule and Billing List.* Majuro Water & Sewer Company, Inc., Republic of the Marshall Islands.

Palmer, S. Y. (2007, April). An Ecosocial Approach to the Epidemic of Cholera in the Marshall Islands. *Social Medicine, 2*(2), 79-86.

Shapiro, J. (2011). *Majuro Drought Resistance.* Majuro: Majuro Water and Sewer Company, Inc.

WHO. (2010). *World Health Statistics*. Retrieved September 2011, from World Health Organization: http://www.who.int/whosis/whostat/en/

Appendices

APPENDIX 1; DRAFT NATIONAL WATER & SANITATION POLICY

Republic of the Marshall Islands

National Water and Sanitation Policy

March 2013

Table of Contents

Definitions

Improved water supply is defined as a water source one that, by nature of its construction or through active intervention, is protected from outside contamination, in particular from contamination with fecal matter. The minimum requirements of a improved water supply are that it is (a) Safe from any contaminant that may cause human harm, (b) Reliable to meet expectations of use, and (c) Adequate quantity to provide for all of necessary health and private sector activities.

Improved sanitation is defined as a facility that hygienically separates human excreta from people, animal and insect contact. More specifically, the minimum requirements of a hygienic toilet are that it (a) Prevents human contact with human excreta, (b) Prevents the discharge of untreated human excreta into open spaces, drains and water bodies, (c) Prevents fly, other insect vector, and animal contact with human excreta, (d) Includes a solid, raised, floor with a smooth and easy-to-sweep finish, (e) Includes or is near to a hand washing facility.

Hand washing Facility is defined as any facility with the presence of soap and running water. If no running water or soap, the most locally appropriate solution shall be included such as ash or hand sanitizer. Hand washing facility must be available at kitchen and inside the restroom for hand washing with soap at all five critical times (after defecation, after cleaning a child's bottom, before preparing food, before feeding a child, and before eating).

Excreta is defined as feces and urine.

Sanitation is defined as the safe management and disposal of liquid and solid wastes, and the practice of healthy behaviors.

El Niño/La Niña-Southern Oscillation is defined as a quasi-periodic climate pattern that occurs across the tropical Pacific Ocean roughly every five years.

Common pool resource is a particular social arrangement collectively regulating the preservation, maintenance, and consumption of a shared good ie. groundwater, fishing stocks, atmosphere, etc. The resources' boundaries are hard to devise and such are generally subject to the problems of congestion, overuse, pollution, and potential destruction unless harvesting or use limits are devised and enforced.

Glossary

CSES	Centre for Science in the Earth System
EPA	Environmental Protection Agency
MWSC	Majuro Water and Sewer Company
KAJUR	Kwajalein Atoll Joint Utility Resources
RMI	Republic of the Marshall Islands
GMI	Government of the Marshall Islands
SOE	State Owned Enterprise
EPPSO	Economic Planning Policy and Statistics Office
DHS	Demographic Health Survey
MOH	Ministry of Health
ENSO	El Niño/La Niña-Southern Oscillation

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Tamera Heine

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Nigel Deacon
Mathew Johnston

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Situation Analysis

The statement that "water is life" is an understatement in RMI where there is a chronic shortage of drinking water and the population is at a high risk of disease due to poor sanitation. Additionally water and sanitation's strong connection to the health and quality of life and the risks associated with climate change make it one of the highest priorities of RMI. All of RMI's 29 atolls and 5 islands are low lying with extremely limited freshwater resources, difficult sanitation challenges and vulnerability to weather and natural disasters. At least 74% of the population now lives in the two urban centers of Majuro and Ebeye (Census, 2010).

"Improved water supply" coverage is high, at least 97%, yet still poses high risk to the population due to limited quantities, contamination and drought (DHS, 2007). The primary source of freshwater is rain mostly through rainwater catchments and in some favorable locations with groundwater lenses. In Majuro the water system is more than 75% rainwater collection (both municipal and household) with the remainder coming from Laura groundwater lens. In Ebeye the water supply system is based solely on desalinization through expensive reverse osmosis filters. By 2006 approximately 60% of outer island water catchments were still unsafe and contaminated (EPA, 2006).

In the last 60 years at least 68 months have been in drought, where the average rainfall for that month and the previous two totalled less than 15 inches (Shapiro, 2011). Gradual sea level rise is predicted and El Nino Southern Oscillation (ENSO) events are projected to become more frequent and/or severe with climate change. Most urban households in Majuro have private rainwater catchments (more than 64% of Majuro households) but the majority don't in Ebeye (37% of Ebeye households), overall 49% of all households have less than 4 days of storage. Additionally the primary water source for 29% of households on Majuro and 56% on Ebeye is their neighbors, while 59% of total households report not having access to their primary drinking water source throughout the year (HWS, 2010) ie when rainwater catchments empty during drought. On Majuro only about 30% of households are connected to the public water system managed by MWSC that distributes water intermittently for set times currently (October 2012) 3.5 hours on 5 weekdays. On Ebeye there is a high percentage of household connections with once weekly distribution and with limited pressure. On the outer islands rainwater is almost exclusively used as the primary water source with 99% of households (DHS, 2007). Dry months are not necessarily indicators of drought but may be part of normal weather patterns. As such the negative impact of empty catchments during such months may point to the need for larger catchments.

Sanitation severely lags behind water with only 70% improved coverage, 82% in urban areas (main township at Majuro and Ebeye) and 53% in rural areas. Despite a law mandating toilets many households are still without improved toilets, with 35% of the population in rural areas and 3.6% in urban still defecating in the open (DHS, 2007). Additionally both urban sewer systems on Majuro and Ebeye dispose raw sewage directly into open water adjacent to populated areas severely impacting the environment and potentially people's health. This trend is especially concerning in dense urban areas and over freshwater lenses where there is contamination of critical fresh water resources and high potential for disease outbreaks. In 2006, 1 in 15 people (6.7%) on Majuro and 1 in 8 people (12.5%) in Ebeye were ill with gastroenteritis (could be described as diarrheal disease) and these are only the cases reported to the Ministry of Health (HWS, 2010). Almost 10% of all deaths of children under five are due to diarrhea (WHO, 2010). RMI has also seen outbreaks of Cholera for instance in 2000 there was over 440 cases and 6 deaths (Palmer, 2007). Diarrheal Diseases, cholera, typhoid, gastroen-

teritis and respiratory diseases are all strongly linked to poor water, sanitation, and hygiene and are of great concern especially for the young. Diarrhea is more common among children who live in households with a non-improved or shared toilet facility than among children who live in households with improved, not shared facilities and therefore Gastroenteritis must be even more prevalent in those households (DHS, 2007).

Indiscriminate disposal of solid waste and unsafe landfills are also a severe problem especially in urban areas, despite the existence of basic waste services. Majuro and Ebeye are still without safe and sanitary landfills, disposal for toxic or hazardous wastes or effective reduce, reuse or recycling programs. Institutional and public water supply and sanitation are also in poor condition with few hygienic or functioning facilities for the public.

In line with government spending priorities and the likely loss of externally generated revenue by 2023 RMI must make decisive improvements in SOE performance for provision of sustainable and equitable services in the future. In 2011 MWSC had over 1 million dollars in receivables and 2 out of 3 customers have been disconnected due to non-payment (MWSC, 2011). On Ebeye, KAJUR has yet to charge fees for water and sanitation services and annually requires a significant government subsidy. Affordability of services is also a key issue with an average income in urban areas of $15k/year and $17k/year in Majuro and Ebeye respectively. More than 12% of households have no income at all (CSES, 2006). Between 2001-6, more than 16 thousand people visited a clinic or hospital with Gastroenteritis in urban areas costing at least 1.9 million dollars (HWS, 2010). This means an annual cost of approximately $400k in 2006 dollars.

On 22 and 23 March 2011, a National Water Summit convened in Majuro highlighted the key sector issues and confirmed the urgency of water and sanitation improvement. In particular it was agreed that while there are a number of official policies, laws, regulations, plans and agreements that articulate RMI's intentions and standards with respect to water and sanitation, they have been developed over several decades in a relatively uncoordinated fashion. Many significant gaps still exist and there is a lack of a specific and overarching national water policy.

Both urban and rural water and sanitation need to be addressed by government policy and programs, including integrated water resource management, water supply, excreta disposal, wastewater, solid waste, storm water drainage and hygienic practices. Effective targeting of improvements is particularly important, both for equity reasons and because the bulk of the disease burden and costs of inadequate provision are carried by the poorest, most vulnerable and most disadvantaged individuals.

In summary this National Water and Sanitation Policy is urgently required in RMI to direct investment in the sector, improve water and sanitation services, and sustainably manage the limited fresh water resources.

Policy Principles

The RMI already faces significant development pressures. These pressures arise from extremely high population densities (on Ebeye and Majuro in particular), high levels of poverty, a dispersed geography of atolls over a large ocean area (making communication difficult and transport expensive), and a small island economy that is physically isolated from world markets but highly susceptible to global influences. Environmental pressures are also acute, with low elevation, fragile island ecosystems, a limited resource base and limited fresh water resources (exacerbating the reliance on imports) resulting in an environment that is highly vulnerable to overuse and degradation.

These pressures are well-documented, in RMI's Strategic Development Plan 'Vision 2018'. The *Vision 2018* document is the broad vision of the nation as to where it would like to be in the year 2018 in terms of its sustainable development. The document sets out long-terms goals, objectives and strategies, which were developed through an extensive consultation process.
In regards to the management water resources and sanitation *Vision 2018* states and subsequently the mission statement for this National Water and Sanitation Policy is;

> *"Enabling all citizens to access clean and adequate water supplies"*
> *and a*
> *"level of hygiene and sanitation comparable to world standards".*

Vision 2018 is part of a three tier plan that includes Master Plans and Action Plans as the second and third tiers. The Master Plans focus on major policy areas of which Water and Sanitation is not singled out but is covered by Infrastructure, Outer Islands Development, Environment, and Resources and Development. Action Plans will be developed through Ministries, Statutory Agencies and Atoll Local Governments. These documents will show programs and projects together with appropriate costing.
The Water and Sanitation Policy will also act in a similar structure where the Policy will act as a Master Plan and a subsequent Action Plan will be developed through Ministries, Statutory Authorities and Atoll Local Governments with programs, projects together with appropriate costing.

The National Water and Sanitation Task Force developed in 2010 and consists of various stakeholders from Government, Agencies and Community Organizations has been the lead in setting the parameters and scope of the policy as well as being constantly consulted on it content.
The following was agreed as the scope of the policy;

1. The National Water and Sanitation Policy shall provide broad guidelines and support the state organ, including its central and local governments, in the formulation of water and sanitation laws, guidelines, strategies, investment plans, programs and projects;
2. Provide guidance and define rules and responsibilities for water and sanitation investment and activities for all sector stakeholders;
3. Provide a framework for the management of freshwater resources, water supply, safe disposal of excreta and wastewater; and the promotion of hygienic behaviors; and
4. Cover all people, organizations and areas throughout RMI.

The RMI has identified a series of priority areas which represent targets for attention and, in some cases, urgent response. While efforts continue to understand the nature of future climate variability, it is clear that the RMI faces major impacts on human health and water security of its communities' livelihoods and infrastructure from sea-level rise, sea surge, typhoons and
rainfall intensity and drought issues from changing rainfall patterns.
To prepare for these impacts, the RMI National Water and Sanitation Policy presents five strategic goals that provide a pathway to an integrated, whole of Marshall Islands response. Objectives and outcomes are identified for each goal.

1. Reduce the occurrence of waterborne illness;
2. Ensure water resource sustainability;
3. Ensure water and sanitation utilities are financially solvent;
4. Target service improvements at the disadvantaged;
5. Be resilient to climate variability and extreme events.

To ensure the RMI meets these goals an initial 5-year Action Plan will be developed covering the period 2013-17. The Action Plan will develop projects and programs that will address the identified priority actions of the Policy.
The outcome will be a comprehensive response to improve the resilience of the people of the
Marshall Islands.

Policy Areas

1. Waterborne Illness

Policy Statement 1:	Diarrheal disease shall be reduced through water quality and sanitation improvements and monitoring and social marketing
Target 1:	By the end of 2015, reduce occurrence of gastroenteritis by 50%

Strategies

1.1 Water Quality Monitoring and Improvement

Water quality shall be ensured for all public, household and commercial water supplies through:

a Monitoring household water quality through representative testing;
b Free chlorine residual testing for connected households;
c Regular water quality testing for all public and commercial water supplies;
d Establishment of a community based water quality officer and monitoring program;
e Improvement of monitoring capacity and certification of water quality laboratories and staff:
f Establishment of a sanitary survey program by Water Committees;
g Assurance that all coastal water quality monitoring sites meet the Marine Recreational Water Quality Standard.
h Maintaining and upgrading municipal infrastructure where necessary to achieve required water quality.

1.2 Social Marketing Campaigns

Social marketing campaigns shall be utilized to improve hygienic behaviors and awareness through:

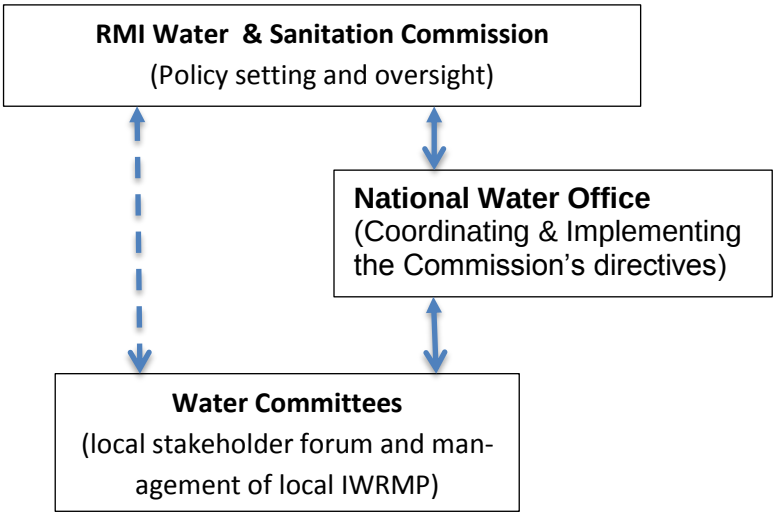
a Promotion of household water treatment and storage, latrine use, safe disposal of children's excreta and handwashing with soap;
b Participation in all global water, sanitation and hygiene days;
c Ensuring active public health workers and sanitation promoters;
d Promoting and enforcing national and local government guidelines, rules and regulations;
e Behavior change programs targeted at stopping open defecation, safe disposal of infant and child excreta, handwashing with soap and household water treatment and storage;
f Build the capacity of local organizations, small enterprises and individuals to undertake lead roles in the supply of water and sanitation goods and services;
g Raise awareness of the costs of inadequate water and sanitation;
h Ensuring improved water and sanitation facilities are available and maintained at all public, commercial and institutional locations;
i Ensuring drinking water availability at all schools public or private.

2. Resource Sustainability

Policy Statement 2:	**Groundwater is a common pool resource and shall be protected with collective and effective management.**
Target 2:	By the end of 2015, all water management organizations shall have an integrated water resource plan.

Strategies

Establish new institutional framework to guide water and sanitation policy across RMI based on the following structure



The Water and Sanitation Commission shall be established by GMI to include representatives from elected officers and the general public and this body shall determine the appropriate representation for the Water and Sanitation Office and the Water Committees.

2.1 Water and Sanitation Commission

The water and sanitation sector shall be governed by a *Water and Sanitation Commission* whom:

a Implements and monitors the water and sanitation policy;
b Makes key decisions on resource allocation and sector policies;
c Represents all key stakeholder groups and has geographic and thematic sub-bodies or sub-committees;
d Anticipates emerging challenges and opportunities;
e Utilizes objective criteria to inform decision-making.
f Oversee ongoing development of the Water & Sanitation Policy in RMI.

2.2 Water and Sanitation Office

The water and sanitation sector shall be coordinated by a *Water and Sanitation Office* whom:

a Provide secretariat to the Water and Sanitation Commission;
b Coordinate RMI National Water Day activities;
c Conduct water & sanitation sector assessments and donor reviews;
d Facilitate annual water and sanitation sector program alignment;
e Improve public communications and awareness on water issues;

f Declaring drought status level for use by water management organizations;
g Review, recommend and enact procedures for implementing policy and monitoring the effectiveness of policy;
h Review, revise, and where necessary enact legislation, regulations and codes relevant to water and sanitation and to the declaration and protection of water reserves.
i Prepare the water and climate outlook report;
j Establish performance monitoring systems and annual strategic reviews.

2.3 Community-Based Water Committees

All ground and surface water shall be managed and regulated by *Water Committees comprised of* representative organizations for each resource or region that:

a Regulate and monitor water use, replenishment and contamination;
b Are represented by the area population, landowners, water users, traditional leaders, local government and national authority;
c Demand strong community participation;
d Gradually endeavor to transition use of other water sources;
e Participate in integrated community based approach for management of water resources, Reimaanlok (National Conservation Area Plan for the Marshall Islands);
f The Water Committee can form part of a Reimaanlok Land Resource Committee
g Establish and manage an integrated water resource plan.

3. Water and Sanitation Services

Policy Statement 3:	**The cost of operation and maintenance of water supply and sanitation systems shall be recovered from service users through a fair and transparent tariff.**
Target 3:	By the end of 2015, all water and sanitation service organizations are financially solvent with transparent and appropriate subsidy for any community service obligations.

Strategies

3.1 Water and Sanitation Tariffs

Municipal water supply is not free, it must ultimately be paid for by the beneficiaries where:

a The cost of operation and maintenance of water supply systems will be recovered from service users through a fair and transparent tariff.

b Water tariffs must be simple, transparent, reflect the ability of the poor to pay and recover the cost of operation and maintenance.

c Commercial, industrial and institutional users should at least pay a rate that covers their total cost of water and sewage services.

3.2 Water Supply and Sanitation Service Management

Water Supplies and sanitation services shall be managed by organizations that:

a Have designed and constructed infrastructure that:

1) Is accessible to the widest number of users including the elderly, disabled, very young and pregnant women;
2) takes account the
    i. Financial and technical management of operation and maintenance;
    ii. Sustainability of resources;
    iii. Disadvantaged members of the community;
    iv. Integration with other sectors.

b Monitor and report to continually reduce unaccounted for water and increase cost recovery from services;

c Store and regulate its resources to ensure availability in times of drought and extreme climatic events;

d Preserve safe drinking water from source to distribution;

e Have clear and official subsidy agreements;

f Take enforcement action against those utilizing or installing illegal connections

g Provide advice & make recommendations as to the impact of any proposed major development on existing water and sanitation infrastructure

3.3 Water Harvesting from Public Buildings & Infrastructure

a Water directly harvested from government buildings may be used for the benefit of the public

4. Target the Disadvantaged

Policy Statement 4:	**Government Investment in water and sanitation service improvements shall be prioritized for those lacking access to improved water and sanitation and drinking water quality deficiencies**
Target 4:	By the end of 2015, 95% of households have access to improved water and sanitation

Strategies

4.1 Target groups

Disadvantaged for the purposes of this water and sanitation policy shall include only:

a Those households or communities with nil or limited access to improved water and sanitation facilities;

b Those living in or with:

1. Extreme poverty;
2. Severe disability due to age, disease, injury or other causes;
3. Disaster or conflict-affected households;
4. Significantly adverse ground conditions (necessitating expensive construction); or
5. Lack of space for private facilities;

And shall recognize the essential role of women in the provision, management and safe-guarding of water, sanitation and hygiene.

4.2 *Behavior change for the disadvantaged*

The disadvantaged shall be specifically targeted by:

a Behavior change programming to achieve improvements in household water treatment and storage, hygiene, and sanitation;

b Provision of specialized incentives and credit options for the supply of water and sanitation services.

4.3 Subsidies for those in need

Those households without access to improved water and sanitation facilities shall be provided subsidies for construction only when:

a There is a long term strategy to ensure that all eligible households will ultimately be provided with equitable services when local, national or donor agencies progressively provide sufficient budget for provision of this subsidy;

b Households are identified by local government or community leaders under clear, objective and repeatable nationwide criteria;

Subsidies may be provided in many forms including; coupons, vouchers, materials or credit and shall be designed to support the private sector and market sustainability, and not to undercut prices or displace existing demand;

4.4 *Public facilities for the disadvantaged*

a An appropriate capacity of sex segregated, disabled access, child, pregnant women and elderly friendly facilities shall be available at all public, commercial and institutional locations;

5. Climate variability and extreme events

Policy Statement 5:	Ensure water and sanitation provision through proactive risk reduction and comprehensive monitoring
Target 5:	By the end of 2015, all safety risks reduced to rating of "Medium" or lower from the Majuro water safety plan

Currently there exists a Water Safety Plan for Majuro but not for Ebeye nor the outer islands.

Strategies

5.1 Resource Monitoring

Comprehensive monitoring programs shall be established to ensure regular and sufficient data to inform sustainable resource management that:

a Regularly monitor quantity and quality of all critical groundwater resources;
b Regularly monitor rainfall in all locations supporting a population with both a school and a health dispensary;
c Regularly monitor sea level rise on Majuro Atoll;

5.2 Safety Planning

A comprehensive national water safety plan shall be developed that includes:

a Separate sections and assessments for each of the two urban centers of Majuro and Ebeye, and the Outer islands;
b Simple, clear, and objective assessment system using likelihood and consequence of event occurrence to determine risk;
c Endorsement by the Water And Sanitation Commission with annual reviews.
d Appropriate plans for outer islands based on population and local conditions.

5.3 *Drought and Extreme Weather Resistance*

Drought and extreme weather events are serious and frequent occurrence and every household, institution, and business should be strongly encouraged and where necessary supported to strengthen their resistance to these events through:

a Promotion of at least 7 days of storage, 200 ft2 of rain catchment area and 300 Gallon fresh water storage per resident, at all residential buildings[1];
b Promotion of at least 7 days of storage, 45 ft2 of rain catchment area and 10 Gallon storage tank per visitor per average day, at all public and commercial building[2] in addition to storage for water used in commercial processes (say washing or ice-making etc);
c Provision of information on safe on-site drinking water treatment in emergencies;

[1] A = Average Daily Fresh Water Use per person with saltwater at residence: 45 Gallons

R = Average Daily Rainfall in Average Month: 0.35 inches

7 Day Storage per person = A* 7 days = 315 Gallons

S = Average rain catchment surface size to produce A per day = Ax12/(Rx7.48) = 206 ft^2

[2] B = Average Daily Fresh Water Use per person with saltwater at non-residential: 10 Gallons

T= Average rain catchment surface size to produce B per day = Bx12/(Rx7.48) = 45 ft^2

d Promotion of rainwater harvesting as the preferred water source wherever feasible;
e Develop early warning systems for droughts and other extreme events affecting water and sanitation provision and inform the community.
f Investigate inter and intra island transfer mechanisms, including water withdrawal, transportation and end storage and usage options

Institutional Approach

Implementation

The implementation of the Water and Sanitation Policy will be ensured and monitored by the Water Commission through the following activities:

1. GMI adoption and support for the policy and establishment of the Water and Sanitation Commission;
2. Development of supporting regulations and legal Instruments;
3. Establishing and annually celebrate March 22 as RMI's National Water Day, October 15 as RMI National Hygiene Day, and November 12th as National Toilet Day;
4. Develop medium term comprehensive strategic plans with all water and sanitation service providers serving more than 5000 people;
5. Annual reviews of sector performance and investment alignment for all water and sanitation service providers serving more than 5000 people ;
6. Development of an annual water and sanitation action plan;
7. Monitoring of waterborne illness;

Roles and Responsibilities

The following institutions shall take the following roles and responsible for Water and Sanitation:

Ministry of Health

The Ministry of Health shall promote reduction in the occurrence of waterborne illness and target programs at the disadvantaged through:

1. Social Marketing Campaigns to improve water and sanitation behaviors;
2. Behavior change and subsidy programs for the disadvantaged.
3. Providing data on occurrence of waterborne illness for monitoring purposes

Ministry of Public Works

The Ministry of Public Works shall be responsible for ensuring governance of water and sanitation service provision including:

1. Construction of water and sanitation facilities for the disadvantaged;
2. Establish and promote minimum standards for water and sanitation infrastructure including those for the disadvantaged;
3. Regulation of all municipal water and sanitation tariffs;
4. Governance of municipal water supply and sanitation service provision;

Chief Secretary's Office

The Chief Secretary's Office shall be responsible for targeting the disadvantaged and promoting actions for drought and extreme weather resistance including:

1. Monitoring and selection of the disadvantaged;
2. Programs to promote drought and extreme weather resistance.

Environmental Protection Agency

The Environmental Protection Agency shall be responsible for resourcing of the Water and Sanitation Office including:

1. Drafting enabling instruments for the *Water and Sanitation Commission*;
2. Drafting enabling instruments for the *Water and Sanitation Office*;
3. Day to day management of the *Water and Sanitation Office*;
4. Monitoring and reporting of water quality at all levels;
5. Facilitating the establishment and ongoing operation of *Water Committees*;
6. Ensuring the ongoing operation of the *Water and Sanitation Commission*;
7. Monitoring the quantity, quality, and contamination of ground and surface water resources;
8. Development and management of the National Water Safety Plan. (Majuro has been drafted).

Households

Households shall be responsible for the construction/provision and maintenance of their own water supply and sanitation facilities that:

1. Meet the minimum criteria of an improved and hygienic facility;
2. Endeavour to maximize their resilience to drought and extreme weather events;
3. Designed to prevent damage or contamination of groundwater when over a freshwater lens.
4. Prevent back syphonage of contaminated water into municipal water supplies.

Public, Commercial and Institutions

All public, commercial and Institutional facilities shall ensure their facilities are:

1. Accessible to improved water supply, sanitation, including safe drinking water, toilets, and hand washing accessories, (running water and soap);
2. Gender segregated and disabled accessible;
3. Available for use for customers and visitors.

References

Census. (2010). Republic of the Marshall Islands. Economic, Planning and Statistics Office.

CSES. (2006). *Community Socio-Economic Survey.* Republic of the Marshall Islands, Economic Policy, Planning and Statistics Office.

CSIRO & Australian Bureau of Meterology. (n.d.). *Australian Bureau of Meterology, CSIRO. (2011). Climate Change in the Pacific;Assessment and Research. Volume 2: Country Reports :Republic of Marshall Islands.*

DHS. (2007). *Demographic and Health Survey 2007.* Republic of the Marshall Islands, Economic Policy, Planning and Statistics Office. SPC and Macro International Inc.

EPA. (2006). Environmental Protection Agency, Republic of Marshall Islands.

EPPSO. (2011). *The RMI 2011 Census of Population and Housing.*

HWS. (2010). *Majuro and Kwajalein Atoll Household Water Survey.* Republic of the Marshall Islands, Economic Policy, Planning and Statistics Office.

KAJUR. (2011). Kwajalein Atoll Joint Utility Resources, Republic of the Marshall Islands, Ebeye.

M., L. R. (2009). *Integrated water resources management in.*

MWSC. (2011). *Water Distribution Schedule and Billing List.* Majuro Water & Sewer Company, Inc., Republic of the Marshall Islands.

Palmer, S. Y. (2007, April). An Ecosocial Approach to the Epidemic of Cholera in the Marshall Islands. *Social Medicine, 2*(2), 79-86.

Shapiro, J. (2011). *Majuro Drought Resistance.* Majuro: Majuro Water and Sewer Company, Inc.

WHO. (2010). *World Health Statistics*. Retrieved September 2011, from World Health Organization: http://www.who.int/whosis/whostat/en/

ANNEXURE 1: Policy Summary

WATER and SANITATION POLICY

Vision: *All Marshallese citizens with access to clean and adequate water supplies; and a level of hygiene and sanitation comparable to world standards.*

GOAL	**1: Reduce the occurrence of waterborne illness**	**2: Ensure water resource sustainability**	**3: Ensure utilities are financially solvent**	**4: Target the disadvantaged**	**5: Be resilient to climate variability and extreme events**
POLICY	Diarrheal disease shall be reduced through water quality improvements and monitoring and social marketing	Groundwater is a common pool resource and shall be protected with collective and effective management	The cost of operation and maintenance of water and sanitation systems shall be recovered from service users through a fair and transparent tariff	Government investment in water and sanitation service improvements shall be prioritized at those lacking access to improved water and sanitation and drinking water quality deficiencies	Ensure water and sanitation provision through proactive risk reduction and comprehensive monitoring
TARGET	By 2015, reduce occurrence of gastroenteritis by 50%	By 2015, all water management organizations have an integrated water resource plan	By 2015, all water and sanitation service organizations are financially solvent	By 2015, the 20% most disadvantaged households have access to improved water and sanitation	By 2015, all vulnerability risks rated "High" or above are reduced from the national water and sanitation assessment
STRATEGIES	*Water Quality Monitoring* *Social Marketing Campaigns*	*Water Committees* *Water and Sanitation Commission* *Water and Sanitation Office*	*Water and Sanitation Tariffs* *Water and Sanitation Service Management*	*Targeting the Disadvantaged* *Subsidies for disadvantaged HH* *Facilities for the disadvantaged* *Behavior change for the disadvantaged*	*Resource Monitoring* *Vulnerability Assessment* *Drought and Extreme weather resistance*

Annexure B; Consultation Report

National Water & Sanitation Task Force Consultation Meeting

Date: 11/15/2012
Place: MIR Conference Room
Process:

- Invitation to National Water Task Force Members

RMI National Water Task Force Members

1. Casten Nemra, Chief Secretary
2. Bruce Kijiner, Office of the President
3. Kino Kabua, Ministry of Foreign Affairs
4. Justina Langidrik, Ministry of Health
5. Rebecca Lorennij, Ministry of Resources and Development
6. Daisy Momotaro, Ministry of Internal Affairs
7. Warwick Harris, OEPPC
8. Hemline Ysawa, EPPSO
9. Lowell Alik, EPA/Policy Sub-Committee
10. Reginald White, Weather Office
11. Mudge Samuel, MALGOV
12. Mona Levy-Strauss, WUTMI
13. Albon Ishoda, MICS
14. Halston DeBrum, MWSC
15. Biuma Samson, CMI Land Grant
16. Jorelik Tibon, MAWC/Laura Lens Committee
17. Evelyn Joseph, Ministry of Education

Technical Members

1. Abraham Hicking, EPA Water Quality Monitoring Laboratory
2. Julian Alik, EPA Education and Awareness Chief
3. Nigel Deacon, MWSC/Policy Sub-Committee/PACTAM Consultant
4. Jina David, CMI Land Grant Extension Officer
5. Julius Lucky, IWRM Project Manager/Policy Sub-Committee
6. Roderick Kabua, IWRM Project Assistant/Policy Sub-Committee
7. Mathew Johnston, EPA Water & Sanitation Planner/Policy Sub-Committee/SPC Consultant
8. Mark Stege, Consultant/ Policy Sub-Committee
9. Moriana Phillips, Consultant/ Policy Sub-Committee
10. Steve Why, OEPPC
11. Joe Cain, PACC Coordinator

- Overviewed the latest draft policy for comments and amendments
- Discussed the Policy process from this point forward

Outcome:

- Discussion Key Issues regarding Draft Policy
- Rewording of Policy Statement 2
    a. From *Water is a common pool resource and shall be protected with effective management* to *Ground water is a common pool resource and shall be protected with collective and effective management*
- Rewording of Policy sections 5.1b&c

a. (b) From *Regularly monitor rainfall in all locations supporting a population more than 500 persons* to *Regularly monitor rainfall in all locations supporting a population with both a school and a health dispensary.*
b. (c) From *Regularly monitor sea level rise in all urban centers* to *Regular monitor sea level rise on Majuro Atoll*


Chief Secretary Consultation

Date: 11/21/2012
Place: Riwut Corner Restaurant
Process

- Invited the Chief Secretary for consultation on Draft Policy

Outcome:

- Suggestion for addition to Objective 5
  a. Investigate inter and intra island transfer mechanisms, including water withdrawal, transportation and end storage and usage options
- Supportive of setting up the National Water & Sanitation Office as soon as possible

Marshall Islands Mayors Association Consultation

Date: 12/14/12
Place: Ministry of Internal Affairs Conference Room
Process:

- This meeting was originally scheduled for a previous date but due to miscommunications, it was moved to 12/14
- Draft Policy overview
- Key Issues & Discussion

Outcome:

- Brief explanation of the policy statements
- Questions raised on; water testing, who is responsible? Is it free? and other common questions related to water.
- Full support from MIMA to push forward as all agreed it is an essential policy
- Supportive of the Community Based Water Committees

Council of Iroij Consultation

Date: Set for W/C 12/17
Outcome:

- The meeting was scheduled with the Chairman of the Council of Iroij, Iroij Kodak Loeak, but due to the death of his brother this meeting was cancelled.

Minister in Assistant/RMI President Consultation

Date: *Set for W/C 12/17*
Outcome:

- Originally this meeting was setup for the Minister in Assistant Tony DeBrum that was unable to meet because of an off-island meeting. The meeting was rescheduled to meet with the RMI President Christopher Loeak, who was covering the duties of the Minister, however it was also cancelled due to death of his brother.

Community Consultation:

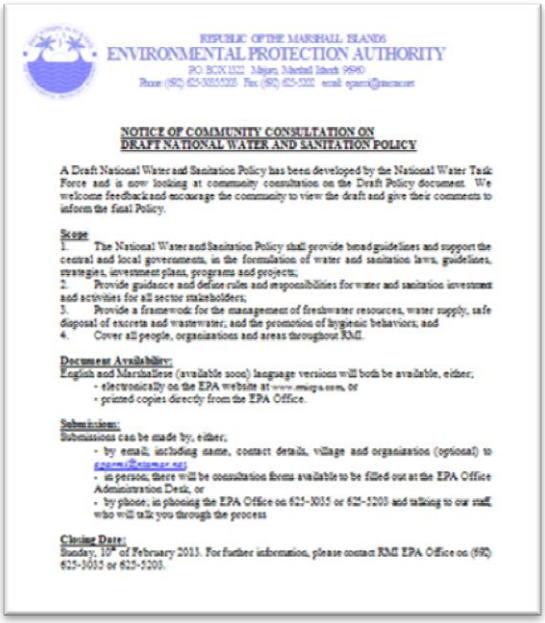
Date: 1/31-2/7/2013

Process:

- Radio;
    a. The EPA Radio Program, aired on Thursday Nights, was used to announce that the Draft Policy was up for consultation and can be seen at the EPA Office, for a three week period
- Newspaper Advertisement;
    a. The Marshall Islands Journal ran an advert over two separate weeks, one week in English and one week in Marshallese.
- EPA Website;
    a. A new EPA Website, rmiepa.com, was developed for the intention of showing the policy document for comments, it was communicated through both the radio program and newspaper advert.

Outcome:

- No responses



REPUBLIC OF THE MARSHALL ISLANDS
ENVIRONMENTAL PROTECTION AUTHORITY
P.O. BOX 1322 Majuro, Marshall Islands 96960
Phone: (692) 625-3035/5203 Fax: (692) 625-5202 email: epami@ntamar.net

NOTICE OF COMMUNITY CONSULTATION ON DRAFT NATIONAL WATER AND SANITATION POLICY

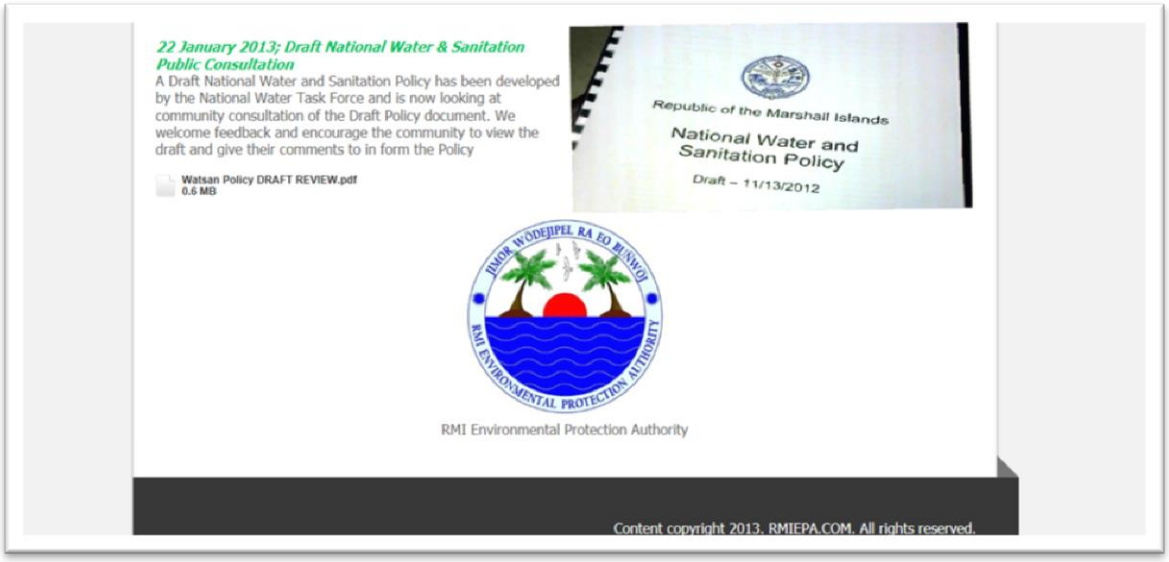
A Draft National Water and Sanitation Policy has been developed by the National Water Task Force and is now looking at community consultation on the Draft Policy document. We welcome feedback and encourage the community to view the draft and give their comments to inform the final Policy.

Scope
1. The National Water and Sanitation Policy shall provide broad guidelines and support the central and local governments, in the formulation of water and sanitation laws, guidelines, strategies, investment plans, programs and projects;
2. Provide guidance and define rules and responsibilities for water and sanitation investment and activities for all sector stakeholders;
3. Provide a framework for the management of freshwater resources, water supply, safe disposal of excreta and wastewater, and the promotion of hygienic behaviors; and
4. Cover all people, organizations and areas throughout RMI.

Document Availability:
English and Marshallese (available soon) language versions will both be available, either;
- electronically on the EPA website at www.miepa.com, or
- printed copies directly from the EPA Office.

Submissions:
Submissions can be made by, either;
- by email, including name, contact details, village and organization (optional) to epami@ntamar.net
- in person, there will be consultation forms available to be filled out at the EPA Office Administration Desk, or
- by phone, in phoning the EPA Office on 625-3035 or 625-5203 and talking to our staff, who will talk you through the process

Closing Date:
Sunday, 10th of February 2013. For further information, please contact RMI EPA Office on (692) 625-3035 or 625-5203.



Majuro Community Consultation

Date: 2/2/2013

Place: World Wetland Day Festival, Youth to Youth in Health Compound

Process:

- Handout pamphlets stating the 5 policies, separate English and Marshallese versions
- Full version of the Draft Policy visible
- Comment book

Outcome:

- Many Policy handouts and full drafts given out, however minimal feedback occurred.

Invitation to Senator and Iroij Mike Kabua to become National Water and Sanitation Champion

Date: 2/4/2013

Place: Riwut Corner Restaurant

Process:

- Draft Policy briefing
- Discuss National Water and Sanitation champion role
- Discuss delivering the Policy to Cabinet

Outcome:

- Full supportive of the Draft Policy
- Accepted the role of being the National Water and Sanitation Champion
- Will be assisting with the process of getting the Policy endorsed

Ebeye Consultations

Date: From 2/7/13 to 2/13/13

Place: Ebeye, Kwajalein Atoll

Process:

- A team of EPA staff flew to Kwajalein Atoll over the memorial day week to consult various community and government groups

Outcome:

- Attended the Kwajalein Memorial Day, community consultation didn't occur due to the late changing of the Day's schedule
- Visited various Ebeye stakeholders including;
    - KALGOV; Very interested in the Draft Policy
    - Kwajalein Waste Management; Brought up community groundwater extraction issues around dumpsite
    - Department of Health; Very happy with the Water Quality Monitoring Program and will be actively involved in carrying them out, also mentioned the possibility of water harvesting from public buildings and infrastructure, and the concerns over the proper capacity of toilets and water in schools.
    - KAJUR; issues were discussed on the current situation of Ebeye residents not currently being charged for water or sewage, their plans on starting to charge when service standards in-crease and their community consultation around how and when water and sewage tariffs

will be introduced. Also discussed was proposed infrastructure plans and how they are target disadvantaged groups within the community.

MALGOV Consultation

Date: 2/26/13
Place: Aliang Restaurant
Process:

- Draft Policy Overview
- Key Issues & Discussion

Outcome:

- Supportive to co-host consultation meeting in the Laura community
- Full support for the Draft Policy

Laura Community Consultation

Date: 3/5/13
Place: Laura Elementary School, Iolap Village
Process:

- Statement given by National Water and Sanitation Champion Senator and Iroij Mike Kabua
- Draft Policy Overview and Presentation on current status of Laura and its groundwater lens and Programs that are occurring
- Discussion Panel with Policy Sub-Committee and National Water Task Force members taking questions from the Laura Community

Outcome:

- High community support for the Policy
- Community interested and engaged about setting up a Community Based Water Committee for the Laura
  Community
- Clear understanding of the current status of lens and how it relates to the Policy
- Many issues raised in the discussion including many of the points that the Policy aims to address including Climate Variability, Groundwater Sustainability and the Targeting of Disadvantaged Communities.





Annexure C; Policy Roadmap

Policy Review

This document is to be reviewed and updated at least on an annual basis. The Water Commission once established shall be responsible for this review, until that time the drafting sub-committee shall assume responsibility.

Policy Financial Provisions

The major financial provision for the Policy is in the establishment of an official Water & Sanitation Office with permanent staffing. The Office's functions are stated within the policy, and it is estimated that a minimum of US$50,000p.a. would be required.

With the enhanced water quality monitoring program being proposed in the policy to reduce the occurrence of waterborne diseases by 50% by 2015, the Water Quality Monitoring Laboratories based at EPA (Majuro & Ebeye) would need further funding capabilities. This is estimated at being a minimum of US$10,000p.a.

One of the key outcomes of the Policy is the aim of the water utilities to become financially solvent, this would reduce the ongoing overall payments of the Government of the Republic of Marshall Islands, and would more than cover the ongoing costs of the stated Water and Sanitation Office and enhanced capacity of the Water Quality Monitoring Laboratories.

Donor assistance will be also be required and to a certain capacity already exists to carry out various programs and projects within the Policy including that of resource monitoring, community engagement and social marketing campaigns.

Ongoing Government financial commitment is required to achieve many outcomes stated within the Policy.

Water & Sanitation Office

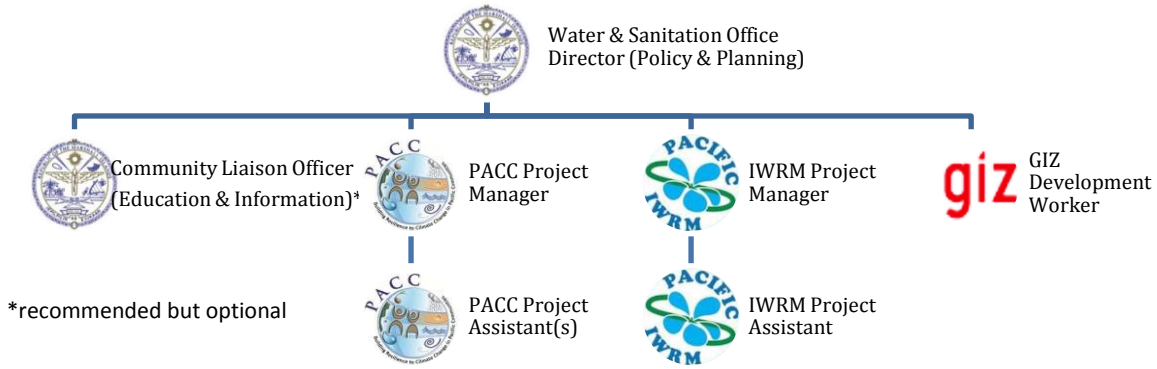
Water & Sanitation Office Commitments

The Policy highly encourages that the official establishment of a National Water and Sanitation Office and its permanent staffing occurs within 6 weeks of the document being signed, this in order to develop an Action & Investment Plan for the activities of the Policy and to coordinate sector programs and investments.

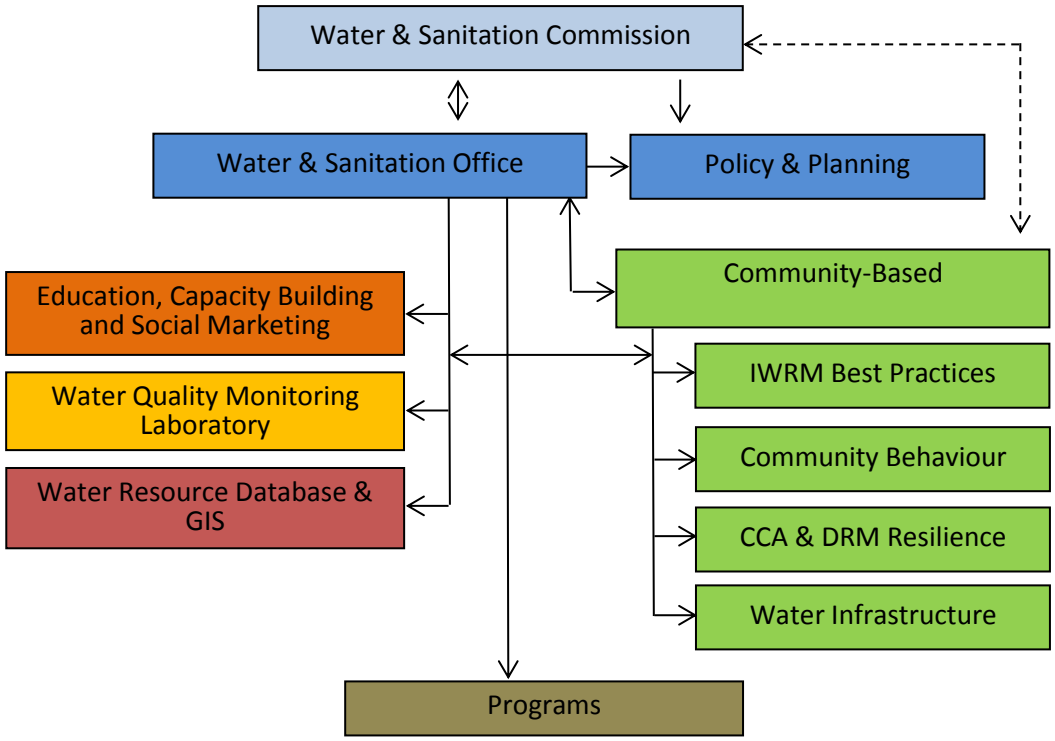
Water & Sanitation Office Proposed Structure/Options

The structure of the Office requires at least one permanent RMI Government funded staff member to manage and be responsible for the policy and sector planning. This position currently exists in the official EPA structure however the position due to funding issues has never been filled.
It is recommended that an additional RMI Government funded staff member exists focussing on Community-level activities.

All other staff members of the Office will be aligned and funded through various programs, including SPC's IWRM Program, GIZ's Development Worker and SPREP's PACC Program. These programs are short-term and cannot be relied upon to carry out the long-term works of the Office.



Water & Sanitation Office Flowchart



Location of the Water & Sanitation Office

The permanent location of the Water & Sanitation Office is still unknown, however below is a table with the likely four existing options of EPA, OEPPC, Chief Secretary's Office and Department of R&D. Each option has been assessed with the positives and negatives discussed, a recommendation will

not be given by this report, and it will be the RMI Government's prerogative to determine the location of the Water & Sanitation Office.

Location	How	Positives	Negatives
Environmental Protection Authority (EPA)	The EPA currently houses the interim Water & Sanitation Office staffed by the IWRM and GIZ staff members.	- The IWRM Program is currently based at EPA - Currently the Chair of the National Water Task Force - Assistance of Education, Information & Awareness Division	- EPA should be focussing on regulation and not on sector wide planning and implementation - Needs to be distinguishable from the Water Quality Monitoring Laboratory - Answerable both to Board of Directors and Minister
Office of Environmental Planning and Policy Coordination (OEPPC)- Office of the President	The existing PACC staff would be joined by IWRM and GIZ staff members under the W&S Office.	- The PACC Program is currently based at OEPPC - Has links to important international partners in SPC, SPREP and others - OEPPC have the mandate for environmental policy and planning - Linking water management with climate change	- Limited capacity of the office to support extra staff - Staff often have various other international commitments
Chief Secretary Office (CSO)	The Office could be based around the existing CSO Water Officer	- Has authority over delivery of water tanks from donors - Streamline decision making between W&S and CCA & DRM fields - Shows the importance of W&S from the Government	- Limited capacity of the office to support extra staff - Diverse interests in fields of CCA & DRM - Has not been an active member of the Policy Sub-Committee
Department of Resources & Development (R&D)	The structure will be similar to the Energy Office that has been set up with R&D	- Has two water Projects; JIRCAS and PEC RO Units - Has the existing successful Energy Office that the Water Office can be based off. - Works in the associated field of agriculture - Water Office located in R&D in other countries	- Limited knowledge in water management - Has not been an active member of the Policy Sub-Committee - Water management would change ministries

Policy Actions & Investment Plan

In the months post the Policy being signed an Action & Investment Plan will be developed to coordinate the activities from Policy with the assistance from National Water Task Force members. The Plan is to be carried out by Moriana Phillips a Masters of Integrated Water Management student as part of her final semester studies.

APPENDIX 2; CCCPIR CONCEPT: GIS DATABASE DEVELOPMENT OF MAJURO WATER AND SEWAGE INFRASTRUCTURE

Project title:	**GIS database development of Majuro water and sewage infrastructure**
Project site(s):	Majuro, Republic of Marshall Islands
Project Partners:	RMI EPA, MWSC (Majuro Water and Sewage Company), OEPPC (Office of Environmental Planning and Policy Coordination)
Total Project Cost:	US$50,000
Project Duration:	12 months

Project Justification

Increasingly variable rainfall, cyclones / hurricanes, accelerating storm water runoff, floods, droughts, decreasing water quality and increasing demand for water are so significant in many small island countries that they threaten the economic development and the health of their peoples.
This Program aims to document the variability within the system by measuring the storage capacities and document the amount of water flowing through it. By knowing this we are able to predict better when Majuro will be required to turn to various water conservation measures and restrictions, in order to make the water reserves stretch as far as possible or call for external assistance.
The Program also aims to save on water reserves by being able to recognise where water is being lost in the system, and subsequently moving to contain that leakage or other threat.
Not all residents are linked to the public system so it is also important that their climate resilience is also met. By documenting all the rainwater catchments and their capacities and coverage we are able to design water management actions that can be targeted towards the disadvantaged and vulnerable.

Project Objectives

1/ Develop a comprehensive infrastructure database for the Water and Sanitation Sector in Majuro, including:

- Groundwater Wells; location, ownership, quantity extracted, condition
- Rainwater Tanks; location, ownership, capacity, condition, type
- Utilities; household connections, pipes, treatment plants, reservoirs, capacities, condition
- Catchments; size, materials, condition, location
- Toilet facilities/septics; type, location, condition, size, ownership

2/ Develop ongoing database maintenance practices

3/ Monitor the amount of water that is being extracted from the Laura Groundwater Lens

4/ Ability to monitor the flow quantities of water resources throughout the public system

5/ Ability to recognize and target the key population areas who are at most risk of limited water and sanitation services

6/ Ability for MWSC to recognize and streamline key areas of infrastructure maintenance

7/ Ability for EPA to monitor locations, conditions and disposal of septic waste from tanks

8/ Ability to calculate the total water reserves capacity within the Majuro water system

Project Components

Component 1; Setting up the GIS network base format

Setting up the GIS network base format involves having GIS capable computers with appropriate GIS software installed. In order to begin adding data and layers an appropriate base map or digitized image is also required.

Base maps……..$5,000
GIS Software Licences……$1,000

Component 2; Capacity building of permanent staff of MWSC/EPA/OEPPC and other associated organizations

Once *Component 1* has been satisfied, this component aims to develop the human capacity of the partner and associated organizations to carry out the project.
This will be in the means of a week-long GIS capacity building workshop, where expert GIS trainers will lead a class through the basics of understanding GIS and how to develop a GIS database. There will be a need to partner with GIS trainers from regional organizations like SPC-SOPAC or USP, this will involve the costs of flights and per diems for such expertise.

Capacity Building Workshop……..$10,000

Component 3; Converting newly released Census & other survey data into GIS format

The Census is about to be released, and by the time of this component the information will be available to be entered into the GIS database along with information from the 2009 Water Survey. Interns will need to be contracted for a period of time to enter the data. A consultant will also be needed to train the interns on GIS data entry. This should be immediately following the Capacity Building Workshop with the GIS expert remaining on to consult the interns.

Consultant to train interns on data entry……$1,000
*Data entry interns (x3)……$9,000**
**3 x 20hrs/week @ $5/hour for 30 weeks, or 1 x 40hrs/week & 1 x 20hrs/week*

Component 4; Scanning and aligning MWSC maps and data into GIS format

MWSC have many analogue maps of pipe and connection networks that need to be digitised and added to form part of the GIS database. A wide-form scanner will be needed to scan the documents and the GIS software should be able to convert to scan to a GIS capable format.

Wide-form Digital Scanner……$5,000

Component 5; Gathering of extra required data in the field to complement and verify existing data sets

MWSC staff will be needed in the field to verify the existing data sets as well as gather extra not existing data to compliment the GIS database. This could be from correcting pipe and connection locations to adding in water flow meters into the system. In order to carry out these activities the MWSC will need handheld GPS units to locate, confirm or create new information on the location of infrastructure during their day to day works.

Handheld GPS Units (x2)……$4,000
Software……$2,000

Component 6; Develop capabilities of water flow monitoring, infrastructure maintenance, water quality monitoring, environmental regulation, water and sanitation policy and planning using the GIS tools developed

Another week-long workshop will be held with all the partners and associated organizations in order to develop the capabilities of the developed GIS database. The workshop is aimed at developing the capabilities of water flow monitoring, infrastructure maintenance, water quality, environmental regulation and water and sanitation policy and planning. It is aimed that the workshop will enable the effective and efficient use and maintenance of the GIS database with detailed informed management decisions being made as a result. There will be a need like in the previous workshop to partner with GIS trainers from regional organizations like SPC-SOPAC or USP, this will involve the costs of flights and per diems for such expertise.

Specialized GIS Capabilities Workshop……$10,000

Project Funding Breakdown

	2013	2014
Component 1	6,000	
Component 2	10,000	
Component 3	6,000	4,000
Component 4	5,000	
Component 5	6,000	
Component 6		10,000
Miscellaneous	2,000	1,000
TOTAL	**35,000**	**15,000**

APPENDIX 3; WORLD WATER DAY ACTIVITIES

School Activities

'Walking for Water'- Friday, March 22

Grade 7 Students from all schools meet at ICC at 8.30am, driven by buses from their schools

Address from the President, 8.45am (hopefully the signing of the National Water Policy)

Photo opportunity with the President outside ICC, 9.00am

Walk begins from ICC towards RRE, course and distance yet to be determined, 9.00am.

Buses based at RRE to take students back to school, 10.00 – 10.30am

Police escort to be determined

Laura & Ebeye students will take part via listening to the President's speech via radio before a corresponding walk

Walk we be part of a larger International Walking for Water activities, occurring across the world

With the International registration we will hopefully receive backpacks as gifts for the students taking part in the walk

Water Quality Testing in Classrooms, the week of WWD.

All schools on Majuro will be visited during the week of World Water Day

Ebeye have also shown interest in having in-class activities.

IWRM, EPA & CMI staff will conduct a class on water quality and H2S water quality testing of rainwater catchments.

Class will be based on the program that already exists, and has been carried out in the Outer Islands by Jina David (CMI).

Essay/ Poster Competition

An Essay/ Poster Competition will be held within all schools

Will be promoted well prior to World Water Day.

We will find a sponsor for the prizes

Awards/prizes will be announced on World Water Day either at the film night or at ICC prior to the walk commencement

School Activities on Delap Field

Each school sending representatives to compete in a range of activities and sporting events that puts school up against school

To occur at 3pm, after school at Delap Field opposite the capital building, WWD

Media/Advertising Activities

NTA-TV (Jina)

Ask to replay various water-related films & activities within archives for month of March

Develop PACC & IWRM films to show on NTA-TV

NTA-TV to show live broadcast of the signing ceremony

Radio Programs (Various Partners; EPA, MoE, MoH, WUTMI, etc.)

Leading up to World Water Day to actively announce various events, activities and highlight various issues relating to water and sanitation

Announce urgent message on conserving freshwater reserves.

Live broadcast of the signing ceremony

Marshall Islands Journal (Mat & Douglas)

Discuss with MIJ about running a comprehensive coverage of events including the Walk, signing of the Policy & Film Festival and other events

Advertising the 'Program of Events' within the paper

Also to use the 'Are you Aware' column to publish simple messages about water and sanitation

Signage

EZ Price Electronic Billboard, ask for promotional sponsorship for the month of March

Hand out program and informational material to local shops and vendors to place in windows

Community Activities

Film Festival

Hold on the night of World Water Day (Friday 22nd March)

Organize with CMI to build two screens, one in town at CMI, and the other out at Laura.

Rango can be shown early for the kids, followed by various water films later.

PACC & IWRM to show the program films.

Presentations given for Photo, Essay & Poster Competitions

Prizes given by sponsors.

Riwut Races

Small model traditional canoe racing

Involving the WAM program and its students

Possibility of holding it along the shoreline of MIR

Political Activities

Signing of the National Water & Sanitation Policy (Mat)

President to sign the Policy at ICC, Friday 22nd March, at 8.45am

If this is not possible, back up is for the President to give a World Water Day address at the same time

Option of holding a celebratory breakfast for members of Nitijela and Government

Other Activities

World Water Day Branded Products

Banner (1); to be displayed prior to the day, and used for the 'Walk'

Bracelets (1000?); given out at all World Water Day events

Gathering of Additional Sponsors/ Support

Ask local businesses if they would like to donate for gifts for 'walkers', Symposium speakers, Competition winners, etc.

Ask International Embassies if they would like to be involved,

Ask other NGO's & Agencies for involvement; ie WUTMI, MoH, UN-Joint Presence, MICS, etc.

PRIZE LIST

Essay	1 Winner
Poster	1 Winner
School Comp.	1st, 2nd & 3rd
Riwut Race	1st, 2nd & 3rd

APPENDIX 4; WORLD WATER DAY POSTER

APPENDIX 5; WORLD WATER DAY PRESIDENTIAL STATEMENT

World Water Day Presidential Statement

Water Cooperation is the theme of this year's World Water Day and this theme is being taken seriously by the Marshall Islands. A National Water and Sanitation Policy has been developed and delivered to Cabinet, hopefully to be signed in the near future. It has been a truly collaborative effort by many government departments, agencies, NGO's and the community themselves.

The Policy emphaises Climate Change and Extreme Weather Events. Certain atolls are currently being impacted greatly by extreme drought. Communities like villagers on Ailuk are currently using brackish water to use for cooking with coconuts being utilised for drinking. It is great to see our International partners contributing with US Embassy and International Organization for Migration supplying 2 more Reverse Osmosis units to be shipped out and assembled with the help from MWSC to Ailuk and another atoll for emergency production of water.

Major development plans are also in the pipeline from other international partners including Australian and Japanese Development Agencies.

The Policy also aims to build Community Based Management Committees who will develop individual management plans for each community developed by the community. It is only when we get the cooperation from the community in the management of water and sanitation do we achieve the best results.

We have many other great programs from various agencies that are working hard and coordinating together to try to achieve greater water and sanitation standards.

Including OEPPC's Pacific Adaptation to Climate Change who are spending over half a million dollars on relining the Majuro Airport Water Storage Tanks with the help of MWSC to help minimise leakage.

We have EPA's Integrated Water Resource Management Program whom are developing composting toilets and dry litter piggery displays out at Laura for the protection of the groundwater lens.

GIZ and the Secretariat of the Pacific Community are setting up a GIS computer database of the pipes, plants, connections and flows throughout Majuro's Water and Sewage network in order to supply and manage the community better.

The Policy also recognises the large issue of waterborne diseases such as gastroenteritis, cholera and dengue fever. An enhanced EPA Water Quality Monitoring Laboratory and better communication procedures with the Ministry of Health is seen as the priority. But with the main message being to the community with the safe treatment and handling of water.

So this World Water Day please think how you can contribute in building greater partnerships within the community and within government in order to achieve our national goal of "Enabling all citizens to have access to clean and adequate water supplies" and with a "level of hygiene and sanitation comparable to world standards".

APPENDIX 6; IWRM RECREATIONAL SITES ADVISORY SIGN

APPENDIX 7; IWRM INFORMATION SHEETS SERIES

Composting Toilets

IWRM Fact Sheet No. 1 of 4

"These toilets not only save water and prevent pollution but they also produce high quality compost that enriches our poor atoll soils."

An expert from Tuvalu lead the construction of composting toilets in Majuro, the Republic of the Marshall Islands (RMI), to trial how effective they are at reducing septic pollution of Majuro's main groundwater resource, the Laura water lens.

The dry eco-san composting toilets use very little water and have the twin benefits of both conserving water and preventing sewage from leaching out of septic systems and into the surrounding environment. The toilets have already been successfully trialled on Tuvalu's main atoll of Funafuti, where 40 toilets have been constructed.

Tuvalu's experience with these toilets has also generated interest in other Pacific island countries. Tonga has constructed two demonstration toilets in households on the island of Vava'u, while Nauru has installed them in several primary schools. The initiative is part of a regional Integrated Water Resources Management (IWRM) demonstration project to build the capacity of Pacific Island countries to manage water resources. Pisi Seleganiu, Project Manager of Tuvalu's GEF IWRM project, believes composting toilets are the most appropriate sanitation technology for atoll countries which have scarce water resources and porous soils.

"Water is such a critical issue in Tuvalu, we recently experienced a serious drought, yet flush toilets that use up to a third of a family's annual water supply are the norm. The septic systems connected to flush toilets are also poorly constructed and much of the

waste inside them seeps out, polluting what little groundwater we have. Septic pollution also finds its way into our lagoons killing the reefs, meaning fishermen have to spend more on fuel to travel further away to catch fish," Mr. Seleganiu said.

"These toilets not only save water and prevent pollution but they also produce high quality compost that enriches our poor atoll soils. Many people are using the compost in their gardens to grow fresh fruit and vegetables, which has the added benefit of reducing household costs and increasing food security."

Three composting toilets are being built in Laura, one at the Laura Lens Learning Centre and two at households that were selected through participation in outreach activities. The installation of the toilets will be followed up with community awareness activities and other initiatives. Mr. Julius Lucky of the Marshall Islands IWRM Program said several Laura residents had already approached him about scaling-up these pilot activities to involve more households.

Mr. Seleganiu said about Tuvalu, "with all new toilet technology there is initial skepticism and questions like whether they are hygienic or smell. We faced this at the outset of our project but once people saw how composting toilets worked and experienced the real benefits they provide, they were satisfied that compost toilets weren't very different to the flush toilets they were used to," and "Demand for the toilets have since increased and we plan to build another 60 on Funafuti and are also working on building them on Tuvalu's outer islands."

A film about Tuvalu's experience with composting toilets can be seen here:

http://www.pacific-iwrm.org/Tuvalu-ECOSAN.html

Developed from an article published on www.pacific-iwrm.org,

The GEF is funding a regional project to build the capacity of Pacific Island countries to manage water resources. 13 national demonstration projects are being run in 12 Pacific countries to show the practical benefits of integrated water resources and wastewater management.

The projects are executed regionally through the Secretariat of the Pacific Community's Applied Geoscience and Technology Division (SOPAC). In partnership with SOPAC, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) are implementing agencies.

For more information on various IWRM Programs and Activities please visit www.pacific-iwrm.org

Photos and images supplied by SPC-SOPAC & M. Johnston

Developed by Mathew Johnston

SPC/GIZ CCCPIR Program

SPC Secretariat of the Pacific Community

giz

Dry-Litter Piggeries

IWRM Fact Sheet No. 3 of 4

"Odours and flies are reduced in the system and the greatest benefit is the efficient capture of nutrients into an integrated composting system"

Current Piggery Operations

There are very few comprehensive livestock waste management systems installed in constructed piggery operations throughout the Pacific. Nearly all of the small piggery operations adopt a water-based approach for pen cleaning. Once clean water is mixed with manure and urine, the resulting wastewater or effluent is considered a 'pollutant' that should be managed to prevent water quality impairments and human health concerns. Water quality laws and regulations in most Pacific Island Nations' prohibit the discharge of wastewater into the ground, surface (streams and lakes) and coastal (beaches, lagoons, mangrove) waters.

Dry-litter Piggery Technology

The dry-litter technology was developed in Hawaii in the mid 1990's as an unconventional system that used no water in pen to clean up, yet proved to be a sanitary and environmentally sound system for hog production. Odours and flies are reduced in the system and the greatest benefit is the efficient capture of nutrients into an integrated composting system. Pathogens are destroyed during active thermal cycle of composting process.

The dry litter system utilizes wood chips to absorb pig waste in the pen. No water is used to wash the pens at all. The sloped floor design delivers the wood chip/ pig mixture to the low end of the pen an subsequently falls into the waste alley. By design, the waste in the alley is collected bi-weekly and placed into bins for composting.

Over the course of approximately two months, the waste mixture is turned several times to create a needed soil amendment for island farms and gardens: compost. Compost has several benefits as amendment to soil including increased fertility and water holding capacity, structure development, and reduced dependence on chemical fertilizer. The process of composting creates temperatures of 130-150 degrees F, which is sufficient to kill pathogenic organisms like Leptospira.

Dry Litter Piggery Programs

The dry litter technology has been adopted in Hawaii, the Republic of Palau, the Commonwealth of the Northern Mariana Islands and the Territory of American Samoa. The Republic of Marshall Islands and the Federated States of Micronesia also have plans to trial the technology as part of their IWRM Projects. The Marshall Islands are actively promoting dry litter piggery waste management in the Laura community of Majuro as a way of reducing wastewater penetrating the groundwater lens and contaminating it. 20 households in Laura have already received a model of the pig pens with a commercial piggery also being adapted.

Developed from a report published by Glen Fukumoto, University of Hawaii

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Photos and images supplied by M Johnston

Developed by Mathew Johnston

SPC/GIZ CCCPIR Program

SPC Secretariat of the Pacific Community giz

Rainwater Catchments

IWRM Fact Sheet No. 2 of 4

"Good system design, operation and maintenance are generally the simplest and most effective means of protecting water quality."

Rainwater Tanks

An appropriate storage tank or vessel is needed to hold the water that is collected from roofs and other surfaces. Appropriate storage tanks include those made of cement, plastic, metal and fiberglass. Cement tanks have been used successfully for over a century in the Pacific Islands and if well maintained can provide good water quality. Plastic tanks are becoming increasingly used and also provide good water quality.

Open topped vessels such as buckets and drums are not recommended for collection of rainwater for drinking purposes as contaminants (e.g. leaves and dust) may easily enter into them. It is not recommended that old oil or chemical drums are used, as these may contain substances harmful to human health.

Storage tank materials should prevent or minimize light penetration to reduce algal growth and other biological activity, which helps maintain water quality. For this reason, clear plastic or fiberglass tanks are not recommended for use in the tropical Pacific.

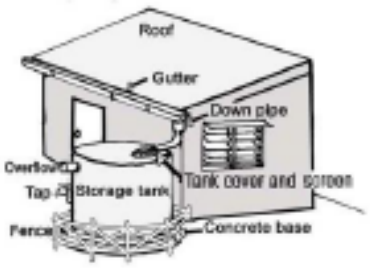
System design

The best initial step to protecting water quality is to ensure good system design. The design should include; clean impervious roof made from smooth, clean non-toxic material. Over hanging branches above the catchment surface should be removed.

Taps or draw-off pipes on tanks should be at least five centimeters above the tank floor (more if debris accumulation rates are high). A tank floor sloping towards the sump can greatly aid tank cleaning as will a well-fitting access manhole.

Wire or nylon mesh should cover all inlets to prevent any insects and other creatures from entering the tank. The tank must be covered and all light excluded to prevent growth of algae and other organisms.

A coarse filter and/or foul flush device should be fitted to intercept water before it enters the tank for removing leaves and other debris.



Operation and maintenance

Proper operation and maintenance of rainwater harvesting systems helps to protect water quality in several ways. Regular inspection and cleaning of catchment, gutters, filters and tanks reduce the likelihood of contamination. Water from other sources should not be mixed with that in the tank.

It is recommended that tanks be cleaned on an annual basis, or as required. Cleaning will help restore good water quality. To clean a tank, first the water must be drained out to the level of the tap and transferred to another rainwater storage or temporary tank. One litre bottle of household bleach can be added to the remaining water in the tank and the tank bottom and sides thoroughly scrubbed with this solution using a brush. The remaining water and bleach solution should then be bucketed out of the tank, the tank refilled and the water left to settle overnight before use.

Water Treatment

Treatment of stored rainwater only makes sense if it is done properly and if hygienic collection and use of the water will ensure it does not suffer from re-contamination. There are several types of treatment possible, the most common being chlorination, boiling, filtration and exposure to ultraviolet or natural sunlight.

i) Chlorination: Chlorination is most appropriately used to treat rainwater if contamination is suspected due to the rainwater being coloured or smelling bad. The tank should first be thoroughly inspected to try to ascertain the cause of any contamination.

About 1 gm (approximately 1/4 tea spoon) of bleaching powder is sufficient to treat 200 litres of water or one tablet of 0.5 g is enough to disinfect 20 litres (a bucketful) of water.

ii) Boiling: Boiling is a very effective method of purification and very simple to carry out. Boiling water for 10 to 20 minutes is enough to remove all biological contaminants.

Developed from articles published on www.rainwaterharvesting.org and www.pacificwater.org

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Photos and images supplied by SPC-SOPAC & M. Johnston

Developed by Mathew Johnston

SPC/GIZ CCCPIR Program

SPC Secretariat of the Pacific Community

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Water Conservation

IWRM Fact Sheet No. 4 of 4

"Water conservation is so vital, it is important we don't take more than we need and to do more with less"

There are lots of ways you can save water at home. Here are some ideas:

1. Take shorter showers

Shorter showers will not only save water but also reduce your hot water costs.

2. Install a water efficient showerhead

You can save up to 13,500 litres of water per person each year by installing a water efficient showerhead (based on a seven minute shower average).

3. Don't leave the tap running

Make sure you don't leave the tap running when you brush your teeth. Simply fill a glass of water to use for rinsing.

4. Install a rainwater tank

Install a tank and connect it to you laundry and garden hose. Tanks are available in a various sizes and styles.

5. Buy a water efficient washing machine

If you're buying a new washing machine, make sure it has at least a four-star water efficiency rating. Front-loading washing machines are usually the most water efficient, using up to 50% less water.

6. Look to the stars!

When buying new appliances, remember the more stars, the more water efficient the appliance.

7. Wash with a full load

Make sure you use your washing machine correctly and that you adjust the water level to suit the size of your load, or better still wait until you have a full load.

8. Use a plug

Use a plug in the sink when preparing vegetables, cleaning fruit or washing dishes by hand.

Household Water Usage

For a snapshot of how water is used around the home, about 80% of water is used inside in showers (30%), bathrooms and general tap use (19%), toilets (14%), washing machines (16%) and dishwashers (1%). The remainder 20% is used outside.

Developed from a report by Melbourne Water,
http://education.melbournewater.com.au/content/water_supply/saving_water_at_home_and_school/saving_water_at_home_and_school.asp

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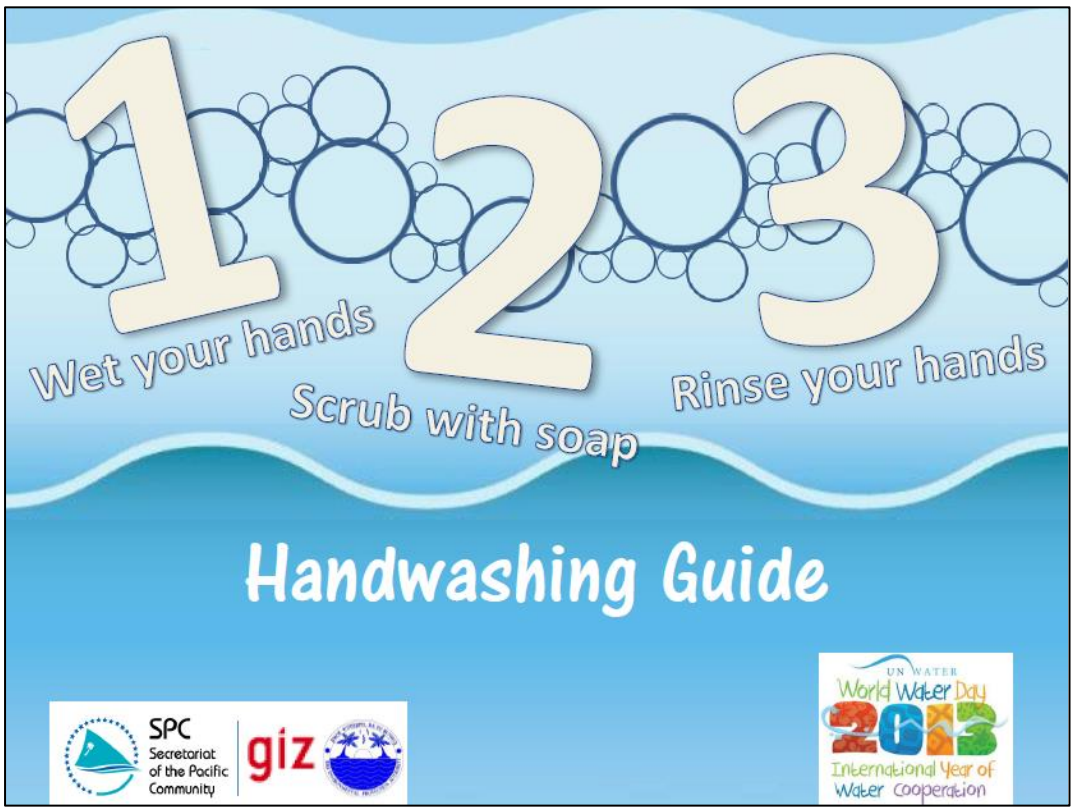
APPENDIX 8; 5 WATER SAVING POINTS (ENGLISH & MARSHALLESE)


FRESH WATER FOR ALL
in these dry times save water in five easy steps!
1 Turn off the tap when washing your hands
2 Supervise kids when they use water
3 Take shorter showers
4 Use a cup when brushing your teeth
5 No outdoor water activities
World Water Day 2013
International Year of Water Cooperation


AIBOJ NAN AOLEP
Ilo ien kein aetok an dret im mōrā mejatoto, kōjbarok dren im loor buńtōn kein lalim!
1 Kune dren eo elańe koj kwal beim
2 Rōjań ajri ro ilo aer kōjerbal dren
3 En jab too an toorlok shower eo
4 Kōjerbal kap nan buraje ńiim
5 Kōjbarok dren ilo am kōjerbale ilo pelaakin mweo
World Water Day 2013
International Year of Water Cooperation

APPENDIX 9; SCHOOL-LEVEL POSTER SERIES




NO
Cloth-
Filtered
Settled
YES
Boiled
Chlorinated
Is your water treated?
SPC
Secretariat
of the Pacific
Community
giz
UN WATER
World Water Day
2013
International Year of
Water Cooperation


Beach
Toilets
Safe Sanitation Practices
SPC
Secretariat
of the Pacific
Community
giz
UN WATER
World Water Day
2013
International Year of
Water Cooperation

APPENDIX 10; CCCPIR CONCEPT: ENHANCING MC'S 'ADAPTING TO CLIMATE CHANGE' WITH A WATER AND SANITATION LENS

SPC GIZ CCCPIR Concept Note

(Maximum 2 pages)

Name of Country Republic of Marshall Islands

Name of Person/Agency submitting this concept note Mathew Johnston

General Information:

Project title:	Enhancing MC's 'Adapting to Climate Change' with a Water and Sanitation Lens
Project site(s):	Majuro, Republic of Marshall Islands
Project Partners:	RMI EPA, MICS, OEPPC, SPC, IOM, MIMRA, MCT
Total Project Cost:	US$10,000
Project Duration:	12 months

Project Description:

- Describe the project; identify (1) planning aspects and (2) on the on-the-ground climate change adaptation project aspects.

Planning Aspects

The project would require a workshop to develop the content with a range of stakeholders and partners. It would subsequently need to find and employ an artist who is able to illustrate the booklet/flipchart. Follow up meetings would be required with the stakeholders and partners to finalize the content of the material.

Climate Change Adaptation Aspects

The project aims to enhance the already successful 'Adapting to Climate Change' educational tool developed for the Micronesian Challenge. This booklet/flipchart is an effective way of giving the region a consistent and comprehensible message and the causes and impact of climate change. This new 'water and sanitation module' aims to enhance the water resource and sanitation aspects that can be used in addition to the existing package.

- Describe the project outputs

1/ Develop a 'Water and Sanitation Module' that gives a consistent and comprehensible message on how water resources impact households and the community.

2/ The educational tool to be used in conjunction with the existing 'Adapting to Climate Change' toolkit.

3/ Develop artwork/text material for water and sanitation topics including;

- Water Conservation
- Rainwater Harvesting

- Groundwater Contamination & Salinization
- Impacts from Drought
- Drought Awareness
- Groundwater Wells Usage
- Sanitation Facilities
- Sanitation Disposal
- Personal Hygiene
- Waterborne Diseases
- Water Quality Monitoring

4/ The 'Water and Sanitation' module to form part of a range of additional modules to the toolkit that may include Coastal & Fisheries Management, Waste Management and Disaster Risk Management.

- Explain how the project builds climate change resilience:

.
The project aims to develop a tool that will provide communities with easily comprehendible information on how climate change can impact their lives and what actions can be taken to enhance the resilience of themselves and their communities. Understanding the impacts of what management decisions are made and how they impact the quantity and quality water resources are important with the future limitations of water under increased climate change conditions.

SPC GIZ CCCPIR Concept Note - Criteria

(Maximum 1 page)

Criteria	**How does the proposed project adhere to the criterion?**
1. *Feasibility*: Is the proposed project feasible taking into account: • Time frame of CCCPIR, • Available budget, • National human resources, • Previous track record with project implementation.	The time, human and financial resources for the proposed project are minimal and could be easily carried out in parallel to other ongoing CCCPIR projects. Support will also be readily available through the agencies and organizations. The existing toolkit has shown to be extremely effective in spreading the climate change message.
2. *Cost: Does* the project require minimal resources	The project only requires minimal financial resources, but can be extremely beneficial in coordinating all existing educational efforts to minimise duplication.
3. *Consistency:* Does the project support the country's climate change adaptation policy and planning	Education and community awareness of climate change form a vital cog in climate change adaptation policy.
4. *Urgency:* Is the project urgent or could it be delayed 10 years with minimal impact	A coordinated water and sanitation information package currently does not exist, and the impact of climate change related impacts like drought are increasing
5. *Scientifically valid*: Is the project based on scientifically valid climate change projections	Many Climate Change experts will be involved within the workshop to provide professional and scientific advice to support the material
6. *Equity:* Does the project involve all sectors of society (especially community participation and gender considerations)	The program aims to integrate various climate change specialists from a range of backgrounds to inform and engage with as many communities

	as possible
7. *Replication:* Can the project be replicated in the country or elsewhere	The 'Water and Sanitation' module aims to form part of a range of additional modules to the toolkit that may include Coastal & Fisheries Management, Waste Management and Disaster Risk Management.
8. *Measurability*: Can the benefits of the project be measured and quantified	The success of the project will be measured on how well the toolkit is developed and created but also on how well the wider climate change community gets involved in supporting its delivery.
9. *Scope of project:* Does the project activity focus on one sector and include a blend of visible (on-the-ground) activities and intangible support activities (e.g. policy development, capacity building)	The scope will be to develop a new module for the existing toolkit, with extensive consultation with many partners and agencies to develop its content.
10. *Risks*: Identify key risks to successful project implementation	Partners not willing to contribute in developing the module

APPENDIX 11; CCCPIR CONCEPT: CLIMATE CHANGE CURRICULUM WORKSHOP

SPC GIZ CCCPIR Concept Note

(Maximum 2 pages)

Name of Country Republic of Marshall Islands

Name of Person/Agency submitting this concept note Mathew Johnston

General Information:

Project title:	Climate Change Curriculum Workshop
Project site(s):	Majuro, Republic of Marshall Islands
Project Partners:	MOE, PREL, IOM
Total Project Cost:	US$5,000
Project Duration:	3 months

Project Description:

- Describe the project; identify (1) planning aspects and (2) on the on-the-ground climate change adaptation project aspects.

Planning Aspects

The Ministry of Education with the PREL Office is developing a Climate Change module that will be developed for 8th grade students. A workshop needs to be developed in order to build capacity of the teachers to run the course across all schools in the Marshall Islands. Other agencies including IOM, OEPPC, RMIEPA, MICS and CMI Land Grant would be beneficial to attend this workshop in order to assist with the teachers in the curriculum but also to build their own capacities to inform outer island communities on all aspects of Climate Change.

Climate Change Adaptation Aspects

The workshop aims to develop the capacity and knowledge of Climate Change Adaptation of the Ministry of Education's teachers in order for them to deliver the Climate Change Module to its students. By communicating climate change adaptation to students hopefully it spreads through their communities as well as setting up a future generational climate change resilience base understanding.

- Describe the project outputs

1/ Workshop aims to develop capacity and knowledge with the Ministry of Education of Climate Change and its impacts and strategies.

2/Understanding of the content of the new Climate Change Curriculum and teaching methods in order to deliver the information to the students.

3/Develop networks between the Ministry of Education and its teachers with the agencies and organizations who are actively working on Climate Change related activities in the Marshall Islands.

4/Agencies and organizations have an understanding of the new Climate Change curriculum and have the possibility of visiting the schools to present various aspects.

5/Aspects of the Climate Change curriculum can be modified and enhanced by interaction with various Climate Change experts

- Explain how the project builds climate change resilience:

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The workshop aims to develop the capabilities of the Ministry of Education to teach Climate Change material to students across the Marshall Islands. It is this climate change information to the next generation of Marshallese people on how and why climate change impacts their communities and environment that ongoing efforts on climate change resilience will be enhanced.

SPC GIZ CCCPIR Concept Note - Criteria

(Maximum 1 page)

Criteria	**How does the proposed project adhere to the criterion?**
11. *Feasibility*: Is the proposed project feasible taking into account: • Time frame of CCCPIR, • Available budget, • National human resources, • Previous track record with project implementation.	The time, human and financial resources for the proposed project are minimal and could be easily carried out in parallel to other ongoing CCCPIR projects. Support will also be readily available through the Ministry of Education and the PREL Office.
12. *Cost: Does* the project require minimal resources	The project only requires minimal financial resources, but can be extremely beneficial in providing training and support for formal ongoing climate change education programs.
13. *Consistency:* Does the project support the country's climate change adaptation policy and planning	Education and community awareness of climate change form a vital cog in climate change adaptation policy.
14. *Urgency:* Is the project urgent or could it be delayed 10 years with minimal impact	The curriculum has been developed and there is a need for teachers and other agencies and organizations to meet, network and understand the content of the module
15. *Scientifically valid*: Is the project based on scientifically valid climate change projections	Many Climate Change experts will be involved within the workshop to provide professional and scientific advice to support the teachers
16. *Equity:* Does the project involve all sectors of society (especially community participation and gender considerations)	The program aims to integrate the Ministry of Education with various climate change specialists from a range of backgrounds
17. *Replication:* Can the project be replicated in the country or elsewhere	The PREL curriculum is to be rolled across the Micronesian region, as well as associating themselves with similar programs occurring in the South Pacific countries
18. *Measurability*: Can the benefits of the project be measured and quantified	The success of the project will be measured on how well the curriculum is taught but also on how

	well the wider climate change community gets involved in supporting the Ministry of Education's delivery
19. *Scope of project:* Does the project activity focus on one sector and include a blend of visible (on-the-ground) activities and intangible support activities (e.g. policy development, capacity building)	The scope will be to involve many stakeholders in a workshop to develop the capability for the Ministry of Educations teachers to deliver a Climate Change Module to 8th Grade students.
20. Risks: Identify key risks to successful project implementation	Valued support of the Climate Change community in networking with the Ministry of Education.