

## **Integrated Water Resources Management Demonstration Project**

**Country: Republic of Kiribati**

**Title: Protection and Management of Shallow Groundwater Sources for South Tarawa**

### ***A. Executing Agency***

The Ministry of Public Works and Utilities in collaboration with the Public Utilities Board will be main executing agencies, working under guidance and assistance of the National Water and Sanitation Coordination Committee.

### ***B. Name and Post of Government Representative endorsing the activity***

Permanent Secretary

Ministry of Public Works and Utilities

P.O Box 498, Betio, Tarawa, Kiribati

### ***C. Cost of Project***

	GEF	Co-Funds
Revisions to National Legislation, Policy & Plans	\$12,000	
Training and support for Committee for the Management and Protection of Water Reserves	\$8,000	\$25,000
Training and support for village water and sanitation committees in Buota and Bonriki	\$10,000	\$30,000
Rain catchment and storage installation on community buildings	\$80,000	\$150,000
Monitoring, analysis and reporting (health, environment, water)	\$70,000	\$180,000
Installation of improved reticulation system and water meters	\$120,000	\$400,000
Improved land management of reserves	\$80,000	\$300,000
Community education campaign	\$30,000	\$90,000
Installation of alternate sanitation system	\$90,000	\$500,000
Total	\$500,000	\$1,675,000

### ***D. Linkage to National Priorities and Programs***

The project's main objective is inline with government policy statement of “*enhancing and ensuring the equitable distribution of development benefits to the people of Kiribati in accordance with principles of good governance*”. The project will concentrate its efforts in addressing key policy issues of helping poorer people who are under strain with unacceptable levels of inequity using Integrated Water Resources Management (IWRM) concepts. The project will work in close partnership with people living in the vicinity of the two main water reserve areas for the urban capital South Tarawa, Bonriki and Buota, to ensure safe water supply for 43.5% of the nation’s population and logistic support for 80% of national developments.

The project is linked to the Kiribati Adaptation Program Phase II Water Resources and Awareness Components and will serve as a demonstration for developing and protecting groundwater source areas in other atolls and islands in Kiribati, especially in designated growth centres. The linkage between the KAPII project and the IWRM project is that KAPII will concentrate on institutional and policy levels and resource assessment, while the IWRM project will work on practical aspects of water resources management.

This project is consistent with the goal of the draft National Water Resources Policy *Water for Healthy Communities, Environments and Sustainable Development* which is:

*“To ensure that communities have affordable access to sustainable water supply systems providing water of suitable quality and appropriate quantities and to appropriate sanitation to meet all reasonable health, environmental, and development needs”*

It addresses most of the specific draft policy objectives within the draft National Policy to:

1. Improve the safety of freshwater supplied from groundwater and rainwater systems.
2. Protect fresh groundwater resources from adverse human impacts.
3. Sustainably manage all aspects of the use and conservation of freshwater.
4. Improve knowledge of the quality and quantity of the nation’s freshwater resources and demand for them.
5. Improve knowledge and management of water resources under climatic extremes, variability and change.
6. Improve outer island water supplies.
7. Increase community awareness and understanding of water resource and sanitation issues.
8. Increase community participation in water resource and sanitation management.
9. Increase the use of rainwater harvesting.

10. Develop instruments to help manage demand and allocation of water.
11. Review and revise, where necessary, all legislation, regulations and organisational responsibilities relevant to water and sanitation.
12. Ensure that people working in the water and sanitation sector have appropriate knowledge and skills.
13. Ensure an adequate supply of trained personnel for the water and sanitation sector.
14. Ensure cost effective planning, operation and maintenance of water supply and sanitation systems.

This demonstration project also addresses water-related goals in the Kiribati National Development Strategy 2003-2007:

1. Raise the quality of life by improving supply and quality of water.
2. Ensure sustainable use of water resources,
3. Promote community participation for better use of water resources,
4. Provide sound infrastructure and services at reasonable costs,
5. Rehabilitate and expand existing water supply systems,
6. Improve collection, storage, treatment and distribution of water,
7. Rehabilitate the sewerage and sanitation system and improve its operation,
8. Improve maintenance standards for government assets, and
9. Ensure that all future construction projects comply with the Environment Act

This demonstration project also addressed strategies raised during extensive consultations throughout the Gilbert Group conducted for the National Adaptation Program of Action, Kiribati Adaptation Project (KAP) Phase I (2003) which identified 10 water and sanitation -related priority strategies in the top 25:

1. Water pumps/pipes to get water from good source to settlement areas and homes
2. Protect water wells
3. Assess and locate available water on the islands
4. Water conservation at home (including awareness raising)
5. Improve sanitation, construct toilets
6. Water conservation in piping systems
7. Install rainwater tanks
8. Install desalination plant

9. Collect water from further away in the bush
10. Proper use of land

At the regional level, the demonstration project is aimed at key issues, concerns and constraints identified in the Pacific Regional Consultation Meeting on Water in Small Island Countries at Sigatoka, Fiji Islands, 29 July – 3 August 2002 which were:

1. Freshwater availability
2. Increasing demands for water.
3. Water quality degradation in surface and groundwater catchments, with consequent down gradient impacts on human health and the environment.
4. Insufficient knowledge of island freshwater resources.
5. Insufficient education, training and capacity in water resources.
6. Inappropriate technology and methods, in relation to rural water supplies.
7. Catchment and groundwater reserve management issues.
8. Vulnerability of water resources to natural hazards, climate variability and change;
9. Insufficient community education, awareness and participation;
10. Water leakage and other losses including wastage in distribution systems;
11. Legislation, policy, planning and administrative issues.

The proposed project also follows strategies identified in the Pacific Regional Action Plan on Sustainable Water Management under its six themes:

1. Water resources
2. Island Vulnerability
3. Awareness
4. Technology
5. Institutional Arrangements
6. Finance

***E. Linkage to IWRM and GEF Project Priority Demonstration***

This Demonstration Project is eligible under the OP9 strategies:

1. Protection of water supplies

2. Land and marine-based sources of pollution

3. Vulnerability to climate change

It also tackles regional priority concerns identified in the Strategic Action Program for the GEF Pacific International Waters Program, which identified Integrated Coastal and Watershed Management as a contributing solution to:

1. Pollution of marine and freshwater from land-based activities

2. Unsustainable exploitation of living and non-living resources.

#### ***F. Context and Background***

Bonriki and Buota water reserves are the only current sources of reticulated safe drinking water for South Tarawa, the capital of Kiribati. These islands supply 43.5% of the nation's population and support the livelihood of more than 80% of local communities. The reserves support more than 80% of national development and are a very high Government priority, with extremely high potential for degradation originated from both human and natural causes.

Safe, fresh water supplies in South Tarawa, the densely populated capital of Kiribati, are at the limit of sustainability. Groundwater source areas in these low lying coral atoll islands are extremely vulnerable. They are under significant threats from rising sea levels resulting from global climate change and variability, from storm surges and from encroachment, pollution and overuse. Less than 30L/person/day of treated water is currently available in the capital. There is no information on actual freshwater use since many households use domestic wells of dubious quality and rainwater to supplement supplies. New sources of affordable, safe freshwater are urgently required. South Tarawa has 43.5% of the country's population, which has grown at an exponential rate of 4% since 1963 due to natural increase and major inward migration. Between 2000 and 2005, the growth rate was 6%. Infant mortality due to water-borne disease in Kiribati is amongst the highest in the Pacific. Diarrhea disease rates in South Tarawa are even higher than the national average. The population density in some areas exceeds 15,000 people/km<sup>2</sup>. but only about 23% of households in the capital are serviced by the saltwater-flush sewage system. Treated, reticulated freshwater for South Tarawa is sourced from shallow, freshwater lenses in Bonriki and Buota islands at the southeastern corner of Tarawa atoll.

To protect groundwater sources, regulations under the 1977 Public Utilities Board Act permitted the declaration of water reserves in South Tarawa. The lands overlying freshwater lenses in Buota, Bonriki, and Teoraereke were declared Water Reserves. These regulations prohibit settlement and allow eviction of existing dwellers and land owners from the Reserves. Despite the regulations, Teoraereke was abandoned as a freshwater source in 1992 because of the unrelenting encroachment by settlers which polluted the groundwater. The extremely limited land area in South Tarawa and the population growth rate

mean that encroachment is a continuing threat to the remaining water reserves and to the safety of the public water supply. Land ownership is essential for subsistence survival, even in urban areas, as it involves traditional resource rights. The declaration of Water Reserves and the pumping of groundwater from private lands for public reticulation were extremely unpopular with landowners and resulted in vandalism of infrastructure. The government now pays an annual lease to landowners but they do not participate in the management or care of the water reserve. Removing settlers from the reserves and the prevention of gravel mining there are politically sensitive issues for the government.

### ***G. Goal Objectives Outputs and Activities***

#### *i) Goal*

To ensure long-term sustainability of the Bonriki and Buota water reserves to meet the growing water demand for urban population and to serve as an exemplary model for small islands states with similar geological settings.

#### *ii) Objectives*

The objectives of the project are to demonstrate the technical, social, economic, legal and environmental systems necessary to protect and properly manage groundwater sources and to demonstrate the health, environmental, social and economic benefits that flow from improved integrated management.

#### *iii) Outputs and Activities*

##### *1. Establishment of Project Management Office*

- Project Coordinator/Manager and staffs appointed on contract basis.
- Project office established adjacent to project site.
- Project Steering Committee established and meeting held on monthly basis.

##### *2. Reformation and strengthening of Community-Government Committee for Management and Protection of Water Reserves in South Tarawa.*

- Obtain approval from the National Water and Sanitation Coordinating Committee for the re-establishment of the committee.
- Meeting convened with Buota and Bonriki villages to select members
- Approval of selected members by the NWSCC.
- TOR for the committee approved.

##### *3. Construction of Water Reticulation System for Buota Village*

- In consultation with the Committee for the Management and Protection of Water Reserves:
- Construction of two elevated tanks (22 kl capacities)
- Laying of 100 mm and 50 mm distribution lines
- Laying of transmission main pipe from Bonriki water treatment plant to the two new elevated tanks
- Connection of individual households using a standard connection design.

4. *Construction of Water Reticulation System for New Bonriki Village*

- Construction of one elevated tank (22 Kl capacity)
- Laying of distribution main
- Laying of transmission main to feed the elevated tank.
- Connecting individual households using the standard connection design.

5. *Trial introduction of a three-tiered water tariff and water metering and Improvement of reserves and diversity of water sources*

- Ensure that all household water connections have water meter installed.
- Develop a model for the formation and operation of village level water and sanitation committees
- Improved procedures for monitoring, analysis and reporting of groundwater condition, water production, water quality, and environmental impacts of water production from reserves and from domestic water wells.
- Cleanup of water reserves including infilling of old babwai and gravel pits and cutting down deep rooted trees to minimize evapo-transpiration.
- Improved health through better protection of groundwater, improved supply of treated water, safe rainwater and well water.
- Improved understanding of the biodiversity of water reserves in South Tarawa.
- Increased use of domestic and communal rainwater harvesting.
- Improved procedures for measuring water use from the reticulation system, domestic wells and rain tanks.
- Increased water production from water reserves.

6. *Improve Health, Welfare and Adaptation for Bonriki and Buota residents*

- Increased social amenity, recreational facilities and employment opportunity for communities around reserves
- Improved sanitation systems for groundwater source areas
- Increased community awareness of strategies and procedures to conserve and protect safe fresh water sources.
- Improved adaptation strategies for managing water reserves under threats from global change.

*Replication:*

This integrated approach to the protection of groundwater sources will be replicated firstly in designated additional freshwater source areas in North Tarawa, then in designated outer island development centres and priority outer islands, then in other outer islands. It is also of direct relevance to other low-lying small island nations in the Pacific and Indian oceans.

*Potential Execution:*

Through the National Water and Sanitation Coordination Committee, convened by the Ministry of Public Works and Utilities (MPWU) with direct contributions from MPWU, the Public Utilities Board, the Environment, Lands and Agricultural Development, Health and Medical Services, Finance and Economic Development, Line and Phoenix Islands Development, Internal and Social Affairs, Fisheries & Marine Resources Development, Education Youth & Sport Development and the Meteorology Office.

*Predicted cost:*

<b>Activity</b>	<b>GEF</b>	<b>Co-Funds</b>
<b>Establishment of Project Management Office</b>	50,000	200,000
<b>2. Reformation and strengthening of Community-Government Committee Management and Protection of Water Reserves</b>	55,000	85,000
<b>3. Construction of Water Reticulation System for Buota Village</b>	105,000	300,000
<b>4. Construction of Water Reticulation System for New Bonriki Village</b>	50,000	200,000
<b>Trial introduction of a three-tiered water tariff</b>	80,000	250,000
<b>6. Improve Health, Welfare and Adaptation for Bonriki and Buota residents</b>	160,000	600,000

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***H. Potential Co-funding:***

Co-funding components of this project will come from projects and current expenditures from the Government of Kiribati and the Public Utilities Board annual budgets. Projects identified as possible co-financing sources are listed below:

Title of Project	Water Supply Extension and Sewerage Improvement
Executing Organisation	Ministry of Public Works & Utilities and Public Utilities Board
Funding Source	EU
Value of Project	AUD\$1,630,000
Project Timeframe	2008-2009
Project Focus	The project is drawn to complete works that are left incomplete by the Asian Development Bank loan funded project in which was implemented from 2003-2005.
Brief description of different types of key activities and expected outcomes	<ul style="list-style-type: none"> <li>• Improve individual house connection using an agreed standard design</li> <li>• Construction of two 22 kl capacity elevated tank at strategic locations in the Temaiku area.</li> <li>• Acquisition of jetting machine to clean sewerage manholes and sewer mains.</li> <li>• Expected outcome is an improved water supply and sewerage services to 43.5% of the total population of Kiribati</li> </ul>
Key Project Contacts	Mr. Taboia Metutera Chief Executive Officer Public Utilities Board Betio, Tarawa

	<p>Kiribati</p> <p>Phone: +686 26292/26056</p> <p>Email: ceo.pub@tskl.net.ki</p>
<p>Areas of overlap or complement with the GEF IWRM project</p>	<ul style="list-style-type: none"> <li>• Installation of improved reticulation system and water meters.</li> <li>• Improve management of water reserves.</li> <li>• Community education campaign.</li> </ul>

*GEF Requested Revisions*