



Pacific Programme for Water Governance



REPUBLIC OF KIRIBATI PILOT PROJECT

A Whole-of-Government Approach to Water Policy and Planning

FINAL REPORT



North Tarawa Kiribati exemplifying the fragility of low island nations

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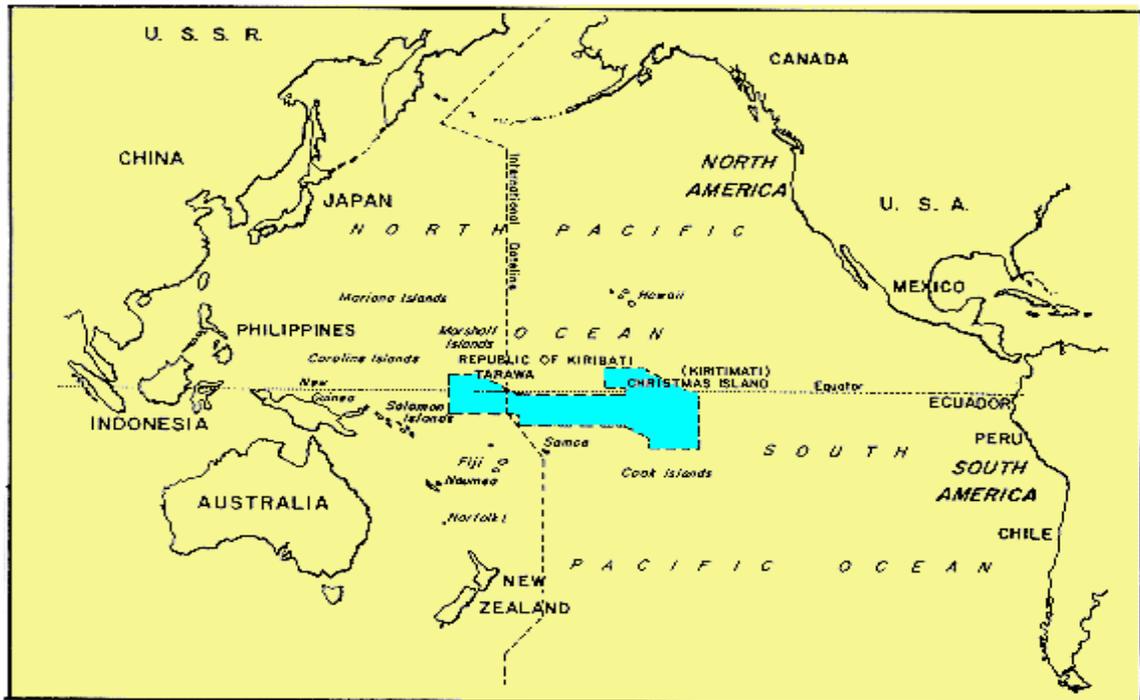


Fig. 1 Location of the Republic of Kiribati in the central and western Pacific

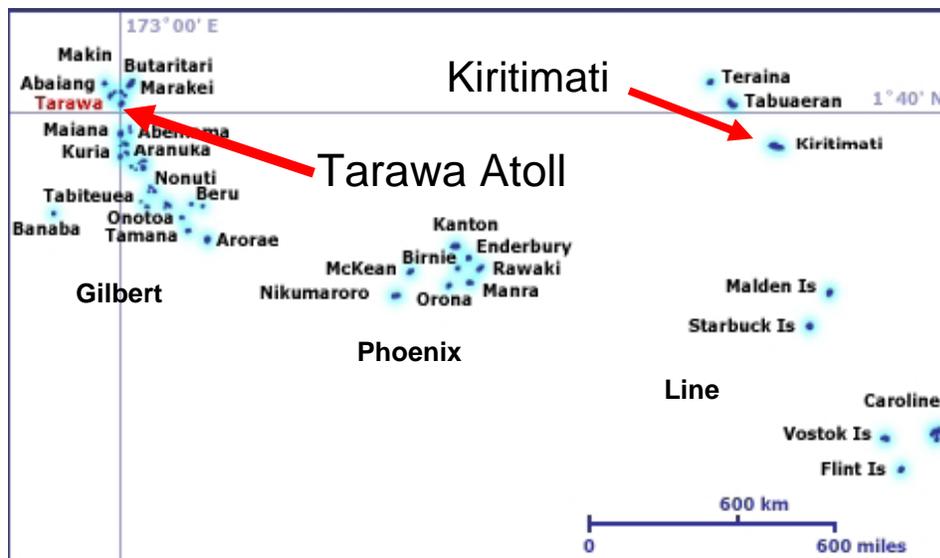


Fig. 2. The three main island groups and atolls and islands of the Republic Kiribati. The location of the main urban centre, the capital, Tarawa atoll and the principal development centre of Kiritimati are also shown.

Summary

The goal of the Pacific component of the European Union Water Governance project coordinated by the Pacific Islands Applied Geoscience Commission is *to promote the application of effective water governance within institutions, systems, structures and processes in three countries in the Pacific selected on the basis of their level of development in water governance*. Three pilot studies were initiated in Fiji Islands, the Republic of Kiribati, and the Solomon Islands on water governance at different scales: national, major utility and local village, island or catchment based. This report describes work carried out in Kiribati.

In its broadest sense water governance can be described as the *capability of a social system to mobilise energies, in a coherent way, for the sustainable development, management and use of water resources*. Effective water governance includes the ability to design public policies that have as their goal the sustainable development, management and use of water resources. It also involves the building of social acceptance and support for this goal and the development of strategies to implement it.

An analysis of the water and sanitation sector in Kiribati was undertaken with the help of key stakeholders in Tarawa. It revealed constraints that are amongst the most complex in the world. Shallow, fresh groundwater is the major source of freshwater and it is extremely vulnerable to natural and human-induced changes. Storm surges, droughts and over-extraction cause salinisation due to seawater intrusion. Settlements and agricultural activities rapidly pollute the shallow groundwater. The incidence of illnesses and deaths from preventable, water-borne diseases, especially amongst children, are unacceptably large. Limited land areas in small islands restrict freshwater quantities, which are especially vulnerable during frequent, severe ENSO-related droughts. The threat of sea level rise due to global warming is a major concern. Demand for freshwater is increasing due to population growth, inward migration to urban centres, which impacts also on water quality. Water use for traditional crops often competes with water supplies for communities and the fertilisation of crops and the raising of domestic animals, particularly pigs, contribute to groundwater pollution. Human and financial resources are limited and the problem of equitably treating both urban and small, numerous and widely dispersed rural outer island villages across three million km² of the central and western Pacific is complex and difficult. Land ownership, which carries with it traditional subsistence and resource rights, is essential for survival, even in urban areas. Land is of high value and carries with it social, political and legal significance. This presents problems in the declaration and protection of groundwater reserves over private lands. Culturally, water ownership remains a contentious issue. The absence of Government-approved unified, national water policy, strategic water plans, and underpinning legislation compounds difficulties. In addition, government agencies tend to operate independently so that collaboration on water and sanitation issues is minimal and the community are not engaged at the national or local level.

Using a simplified model of the policy cycle, this analysis suggested that projects which would be feasible within the relatively short time span of the PfWG project would be: reformation of the National Water and Sanitation Coordination Committee; development of National Water Policy; Major Revision of a 10 year National Water Plan. Discussion documents were produced and disseminated on the advantages of a National whole-of-government and community coordination committee. Draft Terms of Reference and a potential structure for the committee were developed and it was proposed that this Committee be run through the National Strategic Policy and Risk Assessment Unit within the Office of the President, partly to reduce tensions between Ministries over who should lead the Committee. It was proposed that this Committee would then carry forward the draft National Policy and 10 year Plans. When the Committee was formed, however, NSPRAU was without staff and the Ministry of Public Works and Utilities took the lead. At its inaugural meeting the Committee adopted the draft TOR but rejected the idea of the involvement of non-government organisations in the Committee. The advent of a GEF IWRM proposal for funding meant that attention of the Committee was diverted from National Policy and Plans.

There is a continuing need to invest in governance reform in Kiribati including: endorsement of national policy and plans; revision and passing of national water legislation; protection of groundwater sources for public supply; partnering the community in water management and planning; and succession planning and training for water agencies.

Acronyms And Abbreviations

AIDAB	Australian International Development Assistance Bureau (now AusAID)
ADB	Asian Development Bank
AGO	Attorney General's Office
ACIAR	Australian Centre for International Agricultural Research
AMAK	Kiribati Women's Federation
AusAID	Australian Agency for International Development
EU	European Union
ECD	Environment and Conservation Division (within MELAD)
EHU	Environmental Health Unit (within MHMS)
ENSO	El Niño- Southern Oscillation Index
EVI	Environmental Vulnerability Index
GDP	Gross Domestic Product
GEF	Global Environment Facility
GOK	Government of Kiribati
IHP	International Hydrological Programme (of UNESCO)
IWRM	Integrated Water Resource and Sanitation Management
K	Thousand
KANGO	The Kiribati Association of NGOs
KAP	Kiribati Adaptation Program (Phases I, II & III)
km	kilometre
km ²	Square kilometre
KL	Kilolitre (= 1 m ³)
KWASP	Kiritimati Water Supply and Sanitation Project
L	Litre
m	Metre
m ³	Cubic metre
MCTTD	Ministry of Communications, Transport and Tourism Development
MELAD	Ministry of Environment, Land, and Agricultural Development
MEYSD	Ministry of Education Youth & Sport Development
MFED	Ministry of Finance and Economic Development
MFMRD	Ministry of Fisheries and Marine Resources Development
MHMS	Ministry of Health and Medical Services
MISA	Ministry of Internal and Social Affairs
MLPID	Ministry of Line and Phoenix Island Development
MPWU	Ministry of Public Works and Utilities
mm	Millimetre
MO	Meteorology Office (within MCTTD)
MPWU	Ministry of Public Works and Utilities
NAPA	National Adaptation Plan of Action
NCC	National Council of Churches
NASC	National Adaptation Steering Committee
NEP	National Economic Planning (within MFEP)
NGO	Non-government organisation
NZAID	New Zealand International Aid and Development Agency
NSPRAU	National Strategic Policy and Risk Assessment Unit (within OB)
NWSCC	National Water and Sanitation Coordination Committee
OB	Office Te Beretitenti (the President)
OICWSP	Outer Island Community Water Supply Project
OIs	Outer Islands

PfWG	Pacific Water Governance
PUB	Public Utilities Board (within MPWU)
PWD	Public Works Division (within MLPID)
RAP	The Pacific Regional Action Plan for Sustainable Water Management
RPU	Rural Planning Unit (within MISA)
SAPHE	Sanitation, Public Health and Environment Improvement Project
SIDS	Small Island Developing States
SOI	Southern Oscillation Index
SOPAC	South Pacific Applied Geoscience Commission
SPC	Secretariat of the Pacific Community
TT	Technical Team (of NASC)
UN	United Nations
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Program
UNDTCD	United Nations Department of Technical Cooperation for Development
UNDESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPR	Uniform price rebate
WB	World Bank
WEU	Water Engineering Unit (within MPWU)
WUE	Water Use Efficiency
WWF	World Water Forum

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Terms of Reference

The Consultant shall carry out activities for the Pacific component of Programme for Water Governance (PfWG) to promote the application of effective water governance in institutions, systems, structures in Kiribati.

To achieve these outputs, the consultant will:

- 1) Establish initial dialogue with stakeholders: establishment and meeting of Steering Committee to discuss project aims, objectives, define water governance criteria (checklist) and agree local governance issues and concerns. Define overall project outputs.
- 2) Assist in establishment of Steering Committee to discuss possible projects. Prioritise and agree realistic pilot projects over project period. Document options.
- 3) Develop project design documents/TOR with Steering Committee for selected projects - inputs, outputs and outcomes, resources needed. Document above.
- 4) Test and confirm project design at community and wider Government level. Hold seminar/workshop with Steering Committee to review. Final endorsement by Steering Committee including project milestones and outputs. Document above.
- 5) Commence project implementation including any awareness, community education. Agree monitoring arrangements of outputs and milestones with Steering Committee.
- 6) Steering Committee monitoring, inputs by stakeholders
- 7) Progress/final reporting including implications at country and regional levels. Future directions. Project implications – policy, regulatory, institutional, etc

The consultant will be required to:

- 1) assist SOPAC in the adoption of a programme rationale and establishment of selection criteria for IWRM/governance issues in the respective country;
- 2) identify with SOPAC countries relevant governance issues for targeting under the PfWG, and develop in-principle terms of reference for implementing the pilot projects and any follow-on activities;
- 3) contribute to a regional review/discussion;
- 4) with the PICs in question, refine the terms or reference and design the pilot intervention project;
- 5) implement the project and develop country awareness on water governance issues, concerns and 'good' Water Governance principles and how they can be applied in the Pacific social and cultural context.

1. Pacific Programme for Water Governance

The European Union has established a Programme for Water Governance (PFWG), for three regions, Africa, the Caribbean and the Pacific. A successful Pacific region submission in 2002 by the South Pacific Applied Geoscience Commission (SOPAC) proposed three pilot studies in Fiji Islands, Kiribati, and the Solomon Islands for water governance at different scales: national, major utility and local village, island or catchment based.

Increasing demographic trends, hydrogeology, climatic variation and change, urbanisation and the impacts of human activities all combine to impose significant risks to water resources in small island nations. The challenges faced in the water and sanitation sector in small island states are amongst the most difficult in the world. They require a strategic, coordinated whole-of-government approach, in partnership with island communities, that incorporates the existing expertise and experience throughout the government and community sectors and which represents the hopes and needs of communities for adequate water and sanitation.

The overall goal of the EU Water Governance project is:

“to mainstream the principles of good water governance into day to day applications and pilot projects so as to assist in achieving sustainable water resource management and provision of water services”.

The goal of the Pacific component is ***to promote the application of effective water governance within institutions, systems, structures and processes in 3 countries in the Pacific selected on the basis of their level of development in water governance.***

These two goals raise questions concerning our understanding of what constitutes “good water governance” and “effective water governance” particularly in small island developing nations in the Pacific

2. Good Water Governance

In its broadest sense water governance can be described as the *capability of a social system to mobilise energies, in a coherent way, for the sustainable development, management and use of water resources.* The degree of water governance within a society is determined by:

- The degree of consensus about the linkages between society and water;
- Agreement on the bases for public policy that express those linkages;
- The existence of management systems that can effectively implement policies.

Governance implies the capacity to generate and implement appropriate policies based on having established a consensus and coherent management systems and adequate administration. A fundamental factor in governance is the ability to introduce and develop institutions (policies plans, regulations, legislation, incentives and penalties) consistent with the capability, limitations and expectations of the prevailing system.¹

Effective water governance includes the ability to design public policies that have as their goal the sustainable development, management and use of water resources. It also involves the

¹ M. Solanes and A. Jourvalev (2006). *Water governance for development and Sustainability.* UN CEPAS, Santiago Chile, ISBN 92-1-121597-8.

building of social acceptance and support for this goal and the development of strategies to implement it. To be effective, water governance needs to be:

- open,
- transparent,
- participatory,
- communicative,
- sustainable,
- equitable,
- coherent,
- incentive-based,
- efficient,
- sustainable,
- integrative, and
- ethical.

Effective Water Governance recognises the inter-dependencies in the water sector (see Fig 3.)

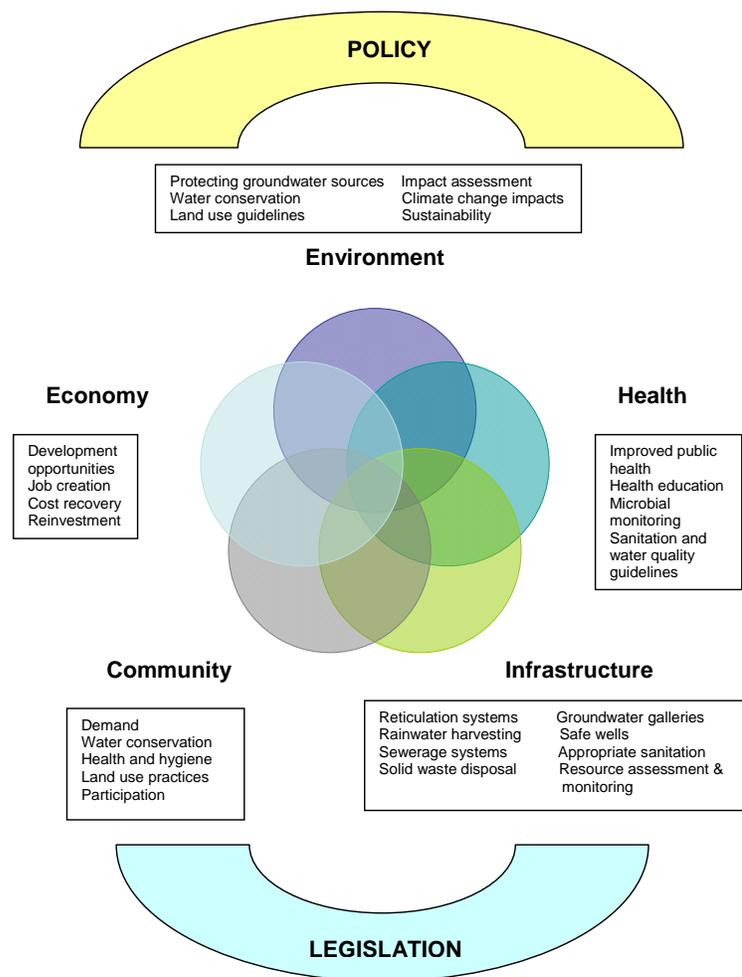


Fig. 3. Interdependencies in the water sector and the overarching and unifying capacity of policy and legislation

From the above it is suggested that *good water governance*:

- Designs knowledge-based public policies
- Builds social acceptance
- Fosters their implementation
- Ensures they are integrative & equitable
- Requires processes and organizations to be efficient and accountable
- Focuses on sustainability
- Engages the community
- Builds-in review & improvement mechanisms.

A number of essential building blocks are needed to improve water governance. These include widely supported overarching policy which expresses the hopes and aspirations of the community. However, policy without implementation mechanisms is ineffectual. Practical and realistic plans to achieve policy goals, underpinning legislation, coordination of agencies with responsibilities in the water sector, which must be information rich, effective industry and community participation, monitoring and review of policy impacts are all necessary for effective governance and sustainable management.

A key question in sustainable water management is what are the organisational characteristics required to manage this unique process? It has been proposed that² adaptive management organisations are in the strongest position to sustainably manage the environment if they have the following characteristics:

- Persistent - maintenance of efforts over time;
- Purposeful - guided by widely supported principles;
- Information rich - strong research base and ethos, integration across disciplines, commitment to monitoring, communication;
- Participatory - involvement of concerned communities;
- Flexibility -preparedness to learn and evolve;
- Adequately resourced; and
- With an adequate statutory and institutional basis.

In water agencies in many Pacific small island nations, the underpinning principles have been inherited from colonial administrations, the extent, quality and use of their resources is unknown, they tend to be single discipline, are reluctant to involve the community, they have restricted flexibility because of limited human and financial resources and often do not have a clearly defined institutional basis. In addition to these organisational constraints, the major challenge in water governance in countries in the Pacific region is coping with the cultural, social and institutional changes necessary in the transition from subsistence cultures to developing, urban communities.

3. Transfer of Water Governance Solutions

There are a plethora of water governance tool kits and prescriptive frameworks that have been proposed over the past decade based on theories and experience in developed countries. There is, however, no easy prescription for the rapid translocation of these relatively recent water

² Dovers, S.R. and Mobbs, C. (1997). An alluring prospect? Ecology and the requirements of adaptive management. In: N. Klomp and I. Lunt (eds). *Environmental justice and market mechanisms*. London: Kluwer Law International.

governance reforms and water management frameworks from developed countries to small island developing countries. In developed countries there are frequently hundreds or thousands of people engaged in the planning, management and use of water. There, some of the major challenges are addressing the environmental impacts of water supply and water effluent systems and predicting the impacts of climate change.

In many small island countries in the Pacific region there are often only one or two water professionals whose tasks may range from replacing washers in domestic taps, replacing groundwater pumps, unblocking clogged sewers to advising on national water policy. The major challenges in water governance that they confront are simply supplying adequate quantities of safe freshwater to urban communities whose water sources is less than two metres below their feet or to dispersed and isolated communities with very limited resources, where there are no economies of scale, and coping with the complex cultural and institutional changes necessary in the transition from the traditions and practices of subsistence communities to the demands of growing, urban communities.

Experience suggests that quick, formulaic solutions that take no account of island priorities, traditions and practices, which developed over millennia, are often politely ignored. Transformation of the water sector in the Pacific involves behavioural change³, which is generally a long term process and requires appreciation of the different nature of freshwater in small island countries and the prevailing culture and traditions. This initial pilot project was planned as a 10 month project, too short for significant behavioural change. The identified projects were therefore focussed on structural improvements achievable in the short term but that will need continued effort to have lasting impact.

4. Constraints on Effective Water Governance in Kiribati

The analyses undertaken of water governance and the main concerns in the water and sanitation sector in Kiribati have revealed a number of interacting constraints to the effective governance and management of the sector.

4.1 Geographic constraints

The geographic setting of Kiribati (Figs 1 & 2) provides significant constraints on the provision of water and sanitation services to its widespread island communities. Kiribati consists of 32 low lying coral islands and 1 raised coral island, Banaba, in 3 main island groups scattered over three million km² of sea in the Central Pacific, between 4° N and 3° S, and 172° E to 157° W. Twelve of these islands are currently unoccupied. The total land area of the country is only 810.8 km² and this limitation of land area plus the generally infertile soils imposes severe resource constraints. The Gilbert Group, with a land area of 285.7 km², contains the capital on the southern islands of Tarawa atoll. South Tarawa is highly urbanised and has 43.5% of the nation's population. Some island population densities there are over 15,000 people/ km².

The Phoenix Group (Fig.2), located some 1750 km east of Tarawa, has 8 largely uninhabited islands with a total land area of just 28.6 km². The only inhabited island of the Phoenix group is Kanton (Canton) Island with the land area of 9 km². The Line Group has 8 islands with a total land area of 496.5 km², extending over a north-south line 2,100 km long and located at a distance of between 3,280 and 4,210 km east of Tarawa, beginning 800 km south of Hawaii. This Group

³ SOPAC and ADB (2002), Proceedings of the Pacific Regional Consultation on Water in Small Island Countries, Sigatoka, Fiji Islands, 19 July – 3 August (2002)

includes the Kiritimati Island, a designated growth centre, with the largest island area in the Republic of 388.4 km². Transport and communications between the widespread islands which make up the Republic and transport costs to other countries around the Pacific pose significant problems.

The country's population of over 92,400 people living in over 14,700 households scattered throughout the inhabited islands. These are located in 1 urban centre with a population of over 40,000 with the remainder in 167 villages in the rural outer islands. Village size in rural areas ranges from 17 to 1872 people (2005 census) with a median size of 245 people. There are over 14700 households with an average household size of 6.5 people/household. Most islands are usually not more than 2 km wide, and, except for the raised island of Banaba, are not more than 6 m above sea level. The task for a small island developing nation of devising governance strategies that are able to deliver equitably water supply and sanitation services and maintain safe water and sanitation services to such small and very widely dispersed communities is both complex and expensive. The tyranny of distance is compounded by the lack of almost any opportunities for economies of scale.

The soils of the low coral islands consist of unconsolidated Holocene coral sands and gravels overlying Pleistocene karst limestone. The hydraulic conductivity of the surface sediments is much higher than rainfall rates so that surface ponding occurs rarely and usually close surrounding relatively impermeable surfaces such as roadways and runways. This means that there are no perennial surface streams in Kiribati. The large hydraulic conductivity also means that surface contaminants are quickly transported into shallow groundwater and that the soils are generally infertile. The islands are mainly covered with coconut and pandanus palms. The mining of phosphate has left the surface of Banaba in a generally barren state although small pockets of fertile soils remain.

The generally poor atoll soil offers little potential for agricultural development apart from the major agricultural export crop, copra, which is harvested as coconuts from abundant coconut trees and processed locally. Seaweed is also grown in the Gilbert and Line Islands and exported. The vast fishing waters around the islands of Kiribati are renowned for their fish which are one of the principal sources of protein for the country and a major source of external revenue. The other main protein sources are pigs and chickens and it has been estimated that Kiribati has on average 2.5 pigs and 4 chickens per household. Dogs are also eaten in the southern Gilberts.

4.2 Climatic constraints

The climate is tropical. Weather is controlled by the seasonal movements and annual variations of the Intertropical Convergence Zone and the Equatorial Doldrum Belt. Long droughts of up to 16 months are common with an average frequency of 6 to 7 years. Average yearly rainfall in the Gilberts ranges from 1,300 mm in the south to 2,000 mm on Tarawa, near the equator, and to over 3,200 mm in the northernmost islands while it is less than 1000 mm in Kiritimati in the Line Islands. Table 1 summarises the known rainfall and coefficients of variability for atolls and islands in Kiribati.

Annual rainfall is highly variable with coefficients of variability as high as 74% in the Gilbert Islands, 80% in the Phoenix Islands and 91% in the Line Islands. Fig. 4 shows the strong correlation between rainfall in South Tarawa and the sea surface temperature anomaly in the Nino 3.4 central Pacific region. Long and severe droughts of up to 16 months, highly correlated to

ENSO events, are common with an average frequency of 6 to 7 years⁴ and have led to the declaration of drought emergencies and to the abandonment of some islands in severe droughts.

Table 1. Mean annual rainfalls and coefficients of variability in Kiribati

Atoll/Island	Island Group	Annual Rainfall (mm)	Coefficient of Variability
Banaba	Gilbert	1,847	0.60
Makin		2,821	0.37
Butaritari		3,107	0.29
Marakei		2,053	0.45
Abaiang		2,158	0.41
Tarawa (North)		1,949	0.50
Tarawa (South)		1,949	0.49
Maiana		1,543	0.55
Abemama		1,518	0.49
Kuria		1,518	0.64
Aranuka		1,518	0.67
Nonouti		1,507	0.65
Tabiteuea (North)		1,418	0.59
Tabiteuea (South)		1,418	0.74
Beru		1,355	0.57
Nikunau		1,242	0.63
Onotoa		1,230	0.59
Tamana		1,425	0.65
Arorae	1,826	0.51	
Kanton	Phoenix	958	0.80
Orona (Hull)		1171	0.60
Enderbury		<i>1000</i>	
Birnie		<i>1000</i>	
Rawaki (Phoenix)		<i>1000</i>	
Manra (Sydney)		<i>1000</i>	
Mackean		<i>1000</i>	
Nikumaroro (Gardner)		1319	0.57
Teraina (Washington)	Line	3,021	0.36
Tabuaeran (Fanning)		2,107	0.43
Kiritimati (Christmas)		974	0.75
Malden		676	0.91
Starbuck		700	
Vostock		800	
Millennium (Caroline)		900	
Flint		<i>1,000</i>	

Rainfalls in italics for uninhabited atolls in Table 4.1 are estimated.

Four atolls, Beru, Butaritari, Tabiteuea North in the Gilberts and Kiritimati Island in Line Islands group, have been chosen as Growth Centres in the latest National Development strategy. While a

⁴ White I., Falkland A., and Scott D. (1999). Droughts in Small Coral Islands: Case Study, South Tarawa, Kiribati. UNESCO-IHP-V .Technical Documents in Hydrology No. 26, UNESCO, Paris, 55 pp.

survey of the water resources of Kiritimati has been completed those of the others are poorly known. If these growth centres are to proceed, assessment of their water resources would seem to be of upmost priority. The natural variation in rainfall, the frequent prolonged droughts add to the difficulty imposed by the dispersed geography of the nation in managing water resources.

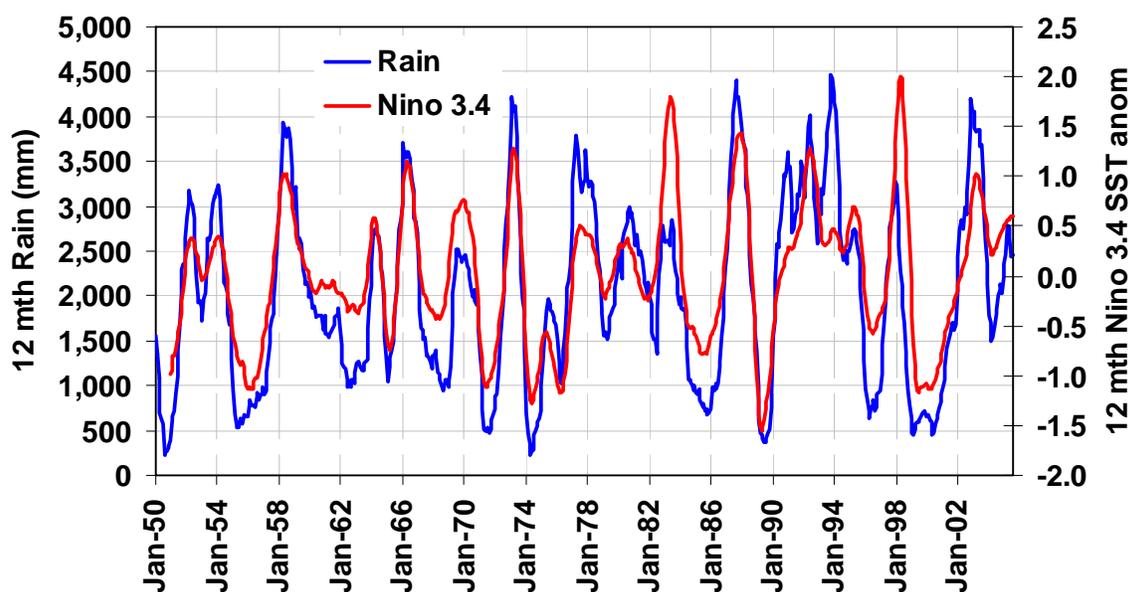


Fig. 4. Correlation between annual rainfall in South Tarawa and the 12 mth Nino 3.4 sea surface temperature anomaly.

4.3 Demographic and demand constraints

Water is used by the community for consumption, cooking and washing, for agriculture, and for industry. In agriculture, water is used by traditional crops, such as coconuts and babai (swamp taro), vegetable and fruit crops and livestock, mainly as pigs and chickens. It is estimated that there are almost 2.5 pigs and 4 chickens per household given an estimated total number of over 34,000 pigs and 55,000 chickens in the country. Apart from coconuts, there is little information on fresh water use in either agriculture or in industry, although it is estimated that 2 pigs require the water of one human. Mature coconut trees are estimated to use approximately 150 L/day of groundwater. The highest priority is to meet the demand for safe drinking water for people.

There is little information on actual water use from various available water sources in either urban or rural areas. In urban areas, per capita demand is growing as acquisition of water using devices such as washing machines increases. In the absence of that information, estimates of the daily per capita potable water requirements have varied between 30 and 100 L, with the WHO recommending a lower limit of 40L/person/day. Well water, even when brackish or polluted is accessed for washing and other non consumptive uses. Freshwater reticulation and Outer Island supply projects have aimed at supplying design demands of 30 to 50L/person/day. The key information then has been the expected number of people in any community. Population census data have been collected in the country at intervals since 1921. Figure 5 shows the growth of total country, Outer Island and urban population in South Tarawa up to the latest census in 2005.

Since 1963⁵ the average exponential growth rate of the total population of Kiribati has been 1.8% while that of Outer Islands has been 0.9% and that of South Tarawa is 4%. These figures reflect the impacts of internal, inward migration from Outer Islands to South Tarawa. If these trends continue, the total population of Kiribati is expected to exceed 113,000 and South Tarawa is likely to have well over 60,000 people by 2020. There has been no comprehensive study carried out of actual use in Kiribati from well, reticulated or rainwater storage systems. If a low estimate of consumption rate of 50 L/person/day of reticulated water is assumed for South Tarawa then demand has already exceeded the current estimated sustainable yield of Bonriki and Buota groundwater source reserves. In some of the Outer Islands and North Tarawa, there are relatively large fresh groundwater reserves capable of sustaining higher populations than currently, however, in most cases the actual quantities of water available for extraction remain to be ascertained.

Table 2 provides a crude estimate of the sustainable yield of atolls in Kiribati and an estimate of the maximum population that is likely to be sustained by fresh groundwater resources. This is based on the estimated sustainable yields in ADB 2004 study Promotion of Effective Water Management Policies and Practices. In Table 2 it has been assumed that the design per capita demand is 100L/person/day. This figure allows for a small quantity of water for agriculture and industry.

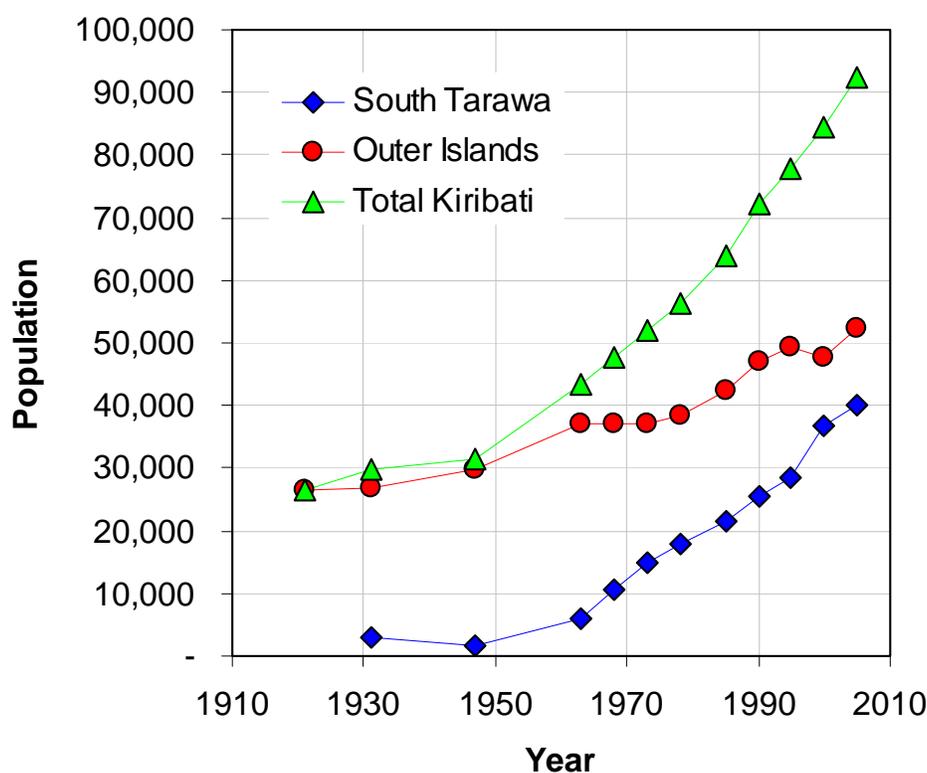


Fig. 5. Population growth in all of Kiribati, Outer Island and urban South Tarawa.

The current Public Utilities Board (PUB) design figure water supply in for South Tarawa is 250 L/household/day. The assumption here is that safe water will be the limitation for population support. No attempt has been made to determine if these populations would encroach on water

⁵ Census data in 1921 may have included data from the Ellis Islands (Tuvalu).

reserves, thereby limiting the volume of safe groundwater available. In these rough estimates of the sustainable fresh groundwater extraction rates and maximum populations that can be supported by groundwater resources, no allowance for the impact of climate change or rainwater harvesting has been made.

Table 2 Estimated sustainable groundwater yield and estimated maximum population sustained by groundwater assuming a demand of 100 L/person/day.

Atoll/Island	Island Group	Estimated Sustainable Yield (m ³ /day)	Estimated Max Population	Population 2005
Banaba	Gilbert	?	?	301
Makin		<i>2790</i>	<i>27900</i>	2388
Butaritari		<i>8755</i>	<i>87550</i>	3267
Marakei		<i>626</i>	<i>6260</i>	2738
Abaiang		<i>2766</i>	<i>27660</i>	5478
Tarawa (North)		<i>4620</i>	<i>46200</i>	5704
Tarawa (South)		2000	20000	40212
Maiana		<i>1315</i>	<i>13150</i>	1909
Abemama		<i>3156</i>	<i>31558</i>	3398
Kuria		<i>1867</i>	<i>18665</i>	1081
Aranuka		<i>1263</i>	<i>12634</i>	1158
Nonouti		<i>1722</i>	<i>17216</i>	3176
Tabiteuea (North)		<i>2025</i>	<i>20248</i>	3603
Tabiteuea (South)		<i>537</i>	<i>5370</i>	1306
Beru		<i>1155</i>	<i>11554</i>	2238
Nikunau	<i>978</i>	<i>9776</i>	1912	
Onotoa	<i>404</i>	<i>4040</i>	1611	
Tamana	<i>480</i>	<i>4795</i>	869	
Arorae	<i>1381</i>	<i>13806</i>	1254	
Kanton	Phoenix	<i>483</i>	<i>4831</i>	41
Orona (Hull)		<i>142</i>	<i>1418</i>	?
Enderbury		<i>181</i>	<i>1812</i>	0
Birnie		<i>68</i>	<i>680</i>	0
Rawaki (Phoenix)		<i>227</i>	<i>2270</i>	0
Manra (Sydney)		<i>272</i>	<i>2719</i>	0
Mackean		<i>181</i>	<i>1812</i>	0
Nikumaroro (Gardner)		<i>344</i>	<i>3440</i>	0
Teraina (Washington)	Line	<i>7268</i>	<i>72682</i>	1154
Tabuaeran (Fanning)		<i>6546</i>	<i>65464</i>	2536
Kiritimati (Christmas)		2000	20000	5094
Malden		<i>1105</i>	<i>11047</i>	0
Starbuck		<i>725</i>	<i>7253</i>	0
Vostock		<i>53</i>	<i>534</i>	0
Millennium (Caroline)		<i>200</i>	<i>1999</i>	0
Flint		<i>340</i>	<i>3398.30137</i>	0
Total		<i>57,974</i>	<i>579,740</i>	92,428
Total (Outer Island)		<i>55,974</i>	<i>559,740</i>	52,216

Note: Figures in **Bold** and shading represent careful estimates of sustainable yield. Figures in *italics* represent crude estimates.

The estimated maximum population of the nation in Table 2 that can be sustained by the estimated groundwater resources is about 580,000. From the exponential total population growth curve in Figure 3.1 it is expected that this population will be reached in the year 2110 if this population growth rate continues. Of the island groups in Table 3.2, The Phoenix group has by far the smallest estimated groundwater sources and accounts for the fact that all but one island in the group are uninhabited. South Tarawa stands out in Table 3.2, since the estimated maximum population that may be safely sustained from the groundwater reserves at Bonriki and Buota is half the present population. On South Tarawa, the agricultural demand is smaller and people are expected to supplement their water requirements from domestic wells, many with dubious quality water, and some from stored rainwater. On this estimate we would predict that the population on South Tarawa has reached its sustainable limit. It is emphasised here that the numbers in Table 3.1 are a guide only. The available safe groundwater resources of most of these islands and atolls have yet to be assessed. This knowledge constraint makes overall management of groundwater in the country extremely difficult.

4.4 Cultural and traditional constraints

The fundamental importance of water to survival in small islands in Kiribati has meant that there has been a long tradition of conserving and caring for water at the family level. Water was always considered a precious commodity⁶. The introduction of public, government-controlled reticulation systems, however, has removed some of the personal commitment. There are several cultural aspects and traditions which impact on the current situation of water and sanitation in South Tarawa.

4.4.1 Land and water ownership

Land on most islands in Kiribati are exclusively owned by individuals. The government only owns land in Kiritimati. On South Tarawa government leases lands from individual land owners mainly in Betio, Bairiki and Bikenibeu. Land ownership is fundamental to the I-Kiribati way of life. Apart from subsistence it has social, political and legal significance⁶. Land ownership traditionally infers ownership of groundwater, provides fishing rights, harvesting rights, and is a social security system. Children who do not care for their parents can be disinherited. Landless people traditionally have no access to subsistence support. Land ownership has been central to the long and costly disputes that occurred between owners of the declared water reserves and the Government. The question of ownership of water reserves and groundwater for public supply will need to be firmly faced before any expansion of water sources into North Tarawa. Involvement of landowners in water reserve protection and the conferring of non-polluting landuse rights, such as coconut harvesting would seem to be culturally appropriate.

The traditional view of water ownership colours people's opinions and is a strong element in the reluctance of people to pay for reticulated water. Some villages seek to restrict access to groundwater resources, to control distribution and demand compensation for restrictions on land use. A practical and equitable solution to this issue is urgently required.

Water is still regarded by many as a free resource despite its high delivery costs. Whilst measures such as installing meters can contribute considerably to reducing water wastage, major changes in community attitudes are also required. Such change can only be achieved over

⁶ Talu A., Baraniko M., Bate K., Beiabure M., Etekiera K., Fakaodo U., Itaia M., Karaiti B., Kirion M.T., Mamara B., Onorio A., Scutz B., Taam T., Tabokia N., Takaio A., Tatua A., Teanako B., Tenten R., Tekonnang F., Teraku T., Tewe T., Tiata T., Timiti U., Kaiuea T., & Uriam K. (1979). *Kiribati: Aspects of History*, Fiji Times & Herald Ltd., Suva, Fiji. 212pp.

extended timeframes and through complementary measures such as information and education campaigns.

4.4.1 Family obligations

Family obligations are paramount to I-Kiribati. Before European times the main social group was the *kainga*, a small group of extended families related through a common ancestor. The first obligation is providing for the family. This is evident in the way households tamper with the water reticulation system so that supplies and pressure to neighbours down gradient are reduced. While some village structure still exists in South Tarawa, urbanisation and squatting has seen a breakdown in traditional village authority which potentially might have constrained more extreme non-social behaviour in using reticulated water. Family obligations also mean that it is normally not possible for a household to discourage relatives from Outer Islands squatting on their land in South Tarawa.

4.4.3 Preference for Groundwater

I-Kiribati express a broad preference for groundwater over rainwater. This is said to be partly because rainwater mixed with toddy does not taste as good as when mixed with groundwater. Given the general condition of groundwater in South Tarawa in particular, this preference has major health implications.

4.4.4 Personal threat

There is a general belief that if an enemy can get some part of you, such as hair or nail clippings, they can perform black magic against you. This has been frequently cited as one of the reasons why compost toilets are unpopular in Kiribati. Unfortunately this prejudice was backed up by the very poor experiences with composting toilets in the AusAID Kiritimati Water Supply and Sanitation Project. It will be extremely difficult in the future to overcome these prejudices.

It is clear, in South Tarawa, that a fundamental problem is the clash between the practices, traditions and mores of traditional subsistence culture with the demands of a highly urbanised society. Transformation will require behavioural change which is a long term process. It is apparent that recognition of this needs to be built into any governance reform process.

5. Governance Impediments

5.1 Ministerial responsibilities

Water and sanitation cut across traditional sectoral boundaries so that no single ministry entity has complete responsibility for the water and sanitation sectors in Kiribati. It is, however, a vital and strategic sector that requires coordination. The following outlines the Ministerial responsibilities and Fig. 6 provides an organisational structure diagram for the sector.

5.1.1 Office Te Beretitenti

The *Directions Assigning Ministerial Responsibility* (5 August 2003) includes “Ministerial Coordination” and “Cabinet taskforces Chairmanship” in the responsibilities of Office Te Beretitenti (the President, OB). The strategic national importance of water and health suggests that government and community activity in water and sanitation should be coordinated by the OB within the recently established National Strategic Policy and Risk Assessment Unit (NSPRAU). The role of the NSPRAU is to:

- Provide support to Cabinet and the President on Cabinet Memoranda
- Review national policies of strategic national importance and of long-term risk;

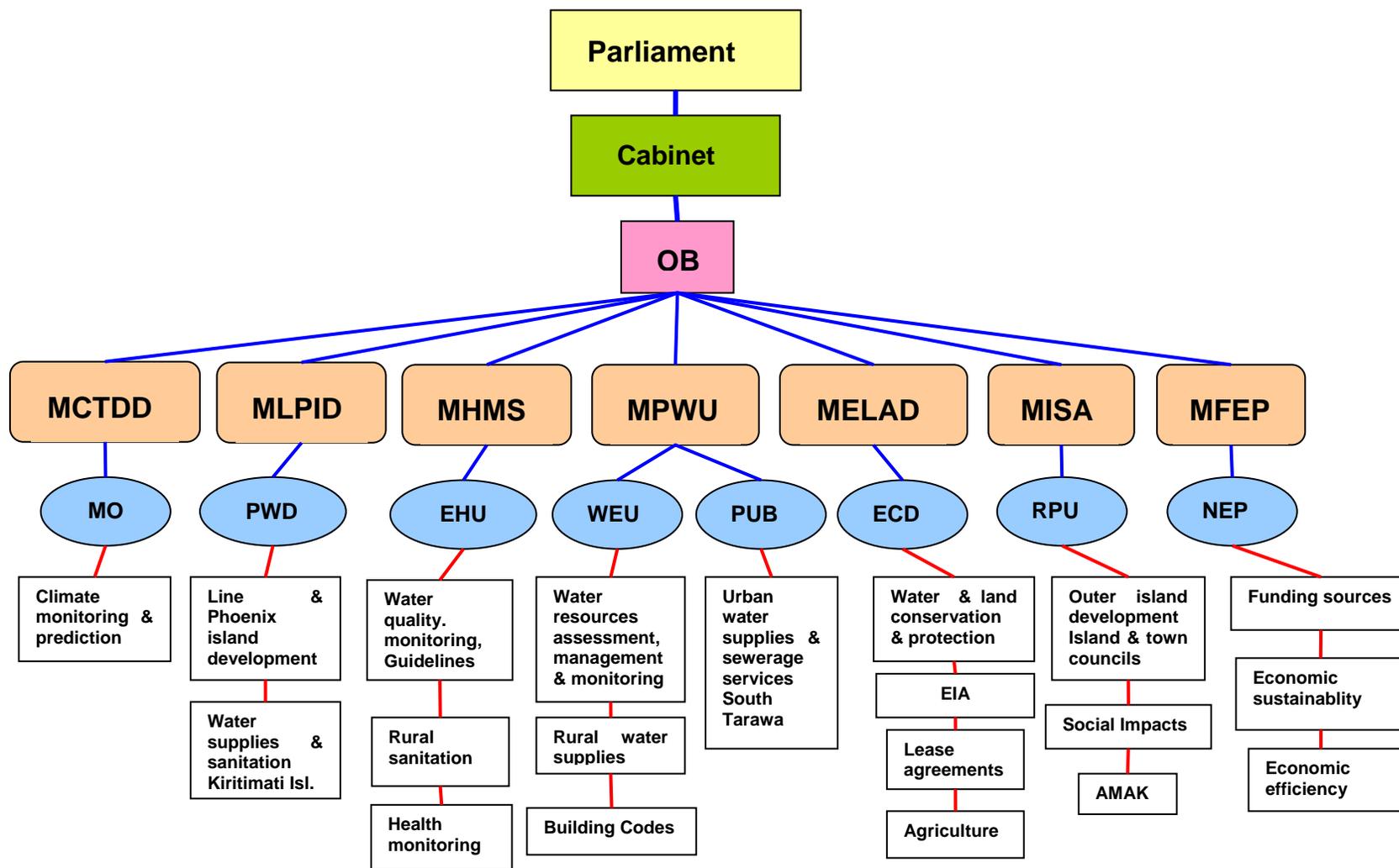


Fig. 6. Kiribati Water Sector Organisational & Responsibility Diagram

- Facilitate inter-ministry coordination on specific issues of national importance;
- Oversee disaster and crisis management arrangements.

The *Directions Assigning Ministerial Responsibility* (5 August 2003) also specify particular line Ministry responsibilities in water:

- Minister for Public Works and Utilities – water management; sewerage systems
- Minister for Health and Medical Services – health inspectorate services and environmental health
- Minister for the Environment, Lands and Agricultural Development – environment and conservation; waste and pollution management.

5.1.2 Ministry of Public Works and Utilities - Public Utilities Board

The Public Utilities Board (PUB) was established on 1st July 1977 to coordinate and manage water supply and sewage disposal in urban South Tarawa. The PUB is a Government-owned corporation under the Ministry of Public Works and Utilities responsible for power generation, water supply, and sewerage. The PUB's Board of Directors is appointed by a Panel of three Ministers chaired by the Minister for Public Works and Utilities with two other Ministers appointed by Cabinet. The Board is directly responsible to the Minister for Public Works and Utilities. Regulations under the PUB Act permitted the declaration of water reserves over major groundwater sources for South Tarawa. These prohibit settlement and allow eviction of existing dwellers and land owners from the Reserves. In Tarawa the lands overlying the freshwater lenses in Buota, Bonriki, and Teoraereke were declared Water Reserves.

5.1.3 Ministry of Public Works and Utilities - Water Engineering Unit

The Water Engineering Unit, WEU of the Ministry of Public Works and Utilities was established in March 1986, to coordinate Outer Island water project activities by conducting investigation of new water supply schemes, preparing designs and estimates, preparing project documents for funding submissions, implementing and managing outer islands water supply projects (except Kiritimati). WEU has water technicians in all inhabited outer islands except Canton, Fanning and Washington.

In 2003 the WEU was delegated responsibility for overall water resources management in the country, including South Tarawa and Kiritimati. This responsibility includes water resource assessment, monitoring, planning, and controlling demand and the provision of water supplies in rural areas. The Ministry of Public Works and Utilities also has responsibility for establishing building regulations that include installation of rainwater collection systems.

5.1.4 Ministry of Health and Medical Services

In the late 1960's, responsibility for water supply in Outer Islands was under the then Ministry of Health and Family Planning. In 1985, this was transferred to the then Ministry of Works and Energy, firstly to PUB but then to the newly established Water Engineering Section. The Ministry of Health and Medical Services retains the responsibility for monitoring the quality of drinking water and has laboratories on South Tarawa and Kiritimati. The Environmental Health Unit of the Ministry is responsible for this monitoring and the provision of sanitary facilities to the villages outside South Tarawa which includes design and assistance with construction of pit toilets.

5.1.5 Ministry of Environment, Lands and Agriculture Development

The Environment and Conservation Division within the Ministry of Environment, Lands and Agriculture Development is responsible for carrying out Environmental Impact Assessments on major water resource developments, sanitation and waste disposal projects to assess their impacts on the environment. In addition, it has responsibility for ensuring the appropriate

protection of groundwater reserves, of ensuring the conservation of freshwater sources and assessing the implication of climate change on freshwater and associated land resources. The Lands Division of the Ministry is responsible for the oversight of lease agreements with landowners on water reserves in South Tarawa.

5.1.6 Island Councils and the Ministry of Internal and Social Affairs

Island Councils play a key role in the implementation of rural water and sanitation schemes. A UNDP/UNCDF Outer Islands Community Water Supply Project (OICWSP) was undertaken in 73 villages in 13 islands of the Gilbert Group in the 1990's. The project reached an agreement between the Water Engineering Unit and Island Councils that Councils involved in the project should take responsibility for the basic maintenance of hand pumps, and contribute voluntary labour and local materials. In addition, the Island Council sanitary aides, who were employed by the then MHFP network, were recruited as water technicians by the MPWU and are responsible for regular quality control and water supply in the villages. All Councils come under the Ministry of Internal and Social Affairs, MISA.

5.1.7 Other Ministries

In addition to those with direct responsibilities in the water and sanitation sector, other ministries have influence, interests and responsibilities in the sector. Funding water projects and on-going maintenance costs as well as cost recovery programmes fall under the Ministry of Finance and Economic Development (MFED). Water supply and sanitation services in Kiritimati are run by the Water and Sanitation Service of the Public Works Department under the Ministry of Line and Phoenix Islands Development (MLPID). Climate measurement, especially rainfall, is the responsibility of the Meteorology Office, within the Ministry of Communications, Transport and Tourism Development (MCTTD [MO]).

Outer island water supplies and sanitation and attendant development opportunities are of special interest to the Rural Planning Unit, MISA. Community groups and organisations such as the Kiribati Women's Federation (AMAK) and Island Councils also fall under MISA.

5.2 Water Policy, Plans, Legislation and Coordination

While there are many definitions of policy it is clear that policy is the collection of government decisions that direct public resources in one direction but not another⁷. There is no clearly enunciated coherent statement of national policy on water and sanitation. Instead there are a collection of ministerial statements and decisions and the outcomes of national consultations.

The very high incidence of diarrhoeal diseases in South Tarawa, particularly amongst young children (see Fig. 6), led to the GOK requesting Australian assistance in 1993. AIDAB's Pacific Regional Team concluded that community health, education, water supply, sanitation, appropriate technology, institutional strengthening and management aspects needed to be considered in a coordinated approach and that the GOK develop suitable strategies and policies for addressing the issues.

In a statement to the Maneaba ni Maungatabu (Kiribati Parliament), on the opening of its fifth session on October 31, 1994, Te Beretitenti (The President) of the Republic, presented an outline of the Government policy on all areas of its responsibility. Those policies that had direct or indirect implications for the water sector of Kiribati were:

- Strong emphasis is placed on the improvement of living standard of an I-Kiribati.

⁷ Bridgman, P. and Davis, G. (2004). The Australian Policy Handbook. 3rd Edition. Allen and Unwin, Sydney.

- Resources and efforts will be directed towards developing subsistence and employment opportunities, and improving living conditions.
- Efforts to reduce population growth will continue.
- The resettlement programme will continue to be developed, new sources of livelihood explored, and basic essential services ensured and expanded.
- Efforts to promote Kiritimati Island as a focus of development will continue.

The Kiribati National Consultation on Sustainable Water Management, conducted as a lead up to the Pacific Regional Consultation on Water in Small Island Countries in 2002, identified the continuing need for adequate supplies of safe drinking water and for better coordination of the water sector. The consultations throughout the Gilbert Group conducted for the National Adaptation Program of Action, Kiribati Adaptation Project Phase I (KAP I) identified 10 water and sanitation -related priority strategies in the top 25:

- Water pumps/pipes to get water from good source to settlement areas and homes
- Protect water wells
- Assess and locate available water on the islands
- Water conservation at home (including awareness raising)
- Improve sanitation, construct toilets
- Water conservation in piping systems
- Install rainwater tanks
- Install desalination plant
- Collect water from further away in the bush
- Proper use of land

The Asian Development Bank (ADB) Technical Assistance Project, *Promotion of Effective Water Management Policies and Practices* in 2004 which excluded South Tarawa because of the then ongoing ADB Sanitation, Public Health and Environment project, developed a 20 year Kiribati Water Sector Road Map that set out strategies and a long-term action programme. Strategies were identified under four key areas: water resource assessment and monitoring; community assessment, consultation and participation; institutional arrangements and policy framework, water and sanitation development and arrangement. The strategies were arranged under 8 projects within these areas. A central initial 12-month task proposed was the development of national policies and procedures for the improvement of operation of the water sector.

The Kiribati National Development Strategy 2003-2007 includes some policies and goals of direct relevance to the water sector:

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

Finally, the Cabinet decision in 2004 to make outer island water supply systems sustainable provides a clear policy direction but one that needs to be imbedded in a broader national water policy framework along with mechanisms to encourage implementation.

5.2.1 Draft national water plan

National plans represent one mechanism for implementing policy. The *Draft National Water Plan*, developed with assistance from the United Nations Department of Technical Cooperation for Development (UNDTCD, now United Nations Department of Economic and Social Affairs, UNDESA) in 1992, and updated in draft form in 2000 by the WEU of the then Ministry of Works and Energy in collaboration with the PUB, identified some of the urgent national issues in water management that needed to be addressed. The most important were the need for national policy guidelines in order to develop priorities and to coordinate the water sector. It also pointed out that, in 1992, authority for overall water resources management had not had been vested in any Government authority and that competence for water resources management and conservation was not identified in any of the then directions assigning Ministerial responsibilities. This was partly addressed in the *Directions Assigning Ministerial Responsibility*, August 2003. The plan remains a draft and has not been endorsed by government.

It is claimed that impaired governance is the main obstacle to better and more equitable water sharing and improved water supply and services in many water-stressed countries⁸. A clear, unified National policy provides the framework for the conservation, sustainable use and management of Kiribati's water resources and for the provision of safe and adequate water to island communities. It represents the vision of the people of Kiribati for the water and sanitation sector. At present this is lacking. Without national policy, it is difficult to introduce legislation or to construct national plans.

5.2.2 Draft national water legislation

Another mechanism necessary for the implementation of policy is the enactment of supporting national water legislation. While regulations exist specifically for the operation of the PUB, there is no equivalent set of regulations for Outer Islands. Draft National Water Legislation was drawn up in 1992 and has been with the Office of the Attorney General since that time. It has yet to be enacted. One problem appears to be that the legislation identifies the government as the owner of the nation's water resources. This appears to be the main impediment to the introduction of the 14 year old draft national water legislation because of its intimate connection with land tenure.

5.2.3 Whole-of-government approach

Water and sanitation cut across traditional sectoral boundaries so that no single ministry has complete responsibility for the water and sanitation sectors in Kiribati. It is clear then that for effective implementation of government policy and plans coordination of the efforts of ministries is required.

Following the Cholera outbreak in the 1977, the British Gilbert Islands Administration recognised the need for better coordination of water and sanitation sector. The Public Utilities Board (PUB) was established in July 1977 under the then Ministry of Works and Energy (MWE), to coordinate and manage water supply and sewage disposal on South Tarawa. About the same time, an interdepartmental committee was set up mainly to review the Australian International Development Assistance Bureau's (AIDAB) Tarawa Sewerage Project which ran from 1978 to 1982 in the densely populated areas of Bikenibeu, Bairiki and Betio. A reticulated freshwater system was installed in South Tarawa between 1983 and 1987 and upgraded in 1989 that

⁸ UNWWAP (2006). *Water a shared responsibility*. The United Nations World Water Development Report 2. UNESCO Paris & Berhann Books, New York.

extracted water from fresh groundwater lenses in the then sparsely populated islands of Bonriki and Buota.

Continuing health, water supply and waste disposal issues in South Tarawa, outer island needs and the recognition of the further need for better coordination led the GOK to formalise in 1985 the *Kiribati Water Supply and Sanitation Coordinating Committee* (KWSSCC). It was chaired by the then Ministry of Health, Family Planning and Social Welfare (MHFPSW) with deputy chair from the then Ministry of Works and Energy and secretarial support from MHFPSW. The Committee was to address the critical water and sanitation issues facing the country.

The planned role of the Committee was to monitor water quality in the country, to review and consider future water and sanitation projects before presentation to Cabinet, and to act as an advisory body to Government Ministries and non-Government organizations on water and sanitation related matters. The Committee members were to be senior officers in MHFPSW, the PUB, the Public Works Department of the MWE, the Ministry of Home Affairs and Rural Development, Ministry of Finance and Economic Planning, and a representative of the non-government organisation (NGO) Karikirakean Maaun te I-Kiribati (formerly - Save the Children Federation). In late 1989, the committee prepared a project proposal for the improvement of san

Unfortunately the Kiribati Water Supply and Sanitation Coordinating Committee has been defunct for some time. Some of the issues cited for its demise are loss of initial enthusiasm after project initiation; disputes over what Government Ministry should be the lead Ministry, a traditional reluctance to share knowledge, and a lack of clear definitions of responsibilities and terms of reference. Instead project-specific steering committees have been formed, but these lack continuity and strategic direction and are driven by the goals of the project rather than national priorities. In addition, Government Ministries have tended to act as independent “silos” and there appear to be major barriers to inter Departmental collaboration.

The *National Adaptation Steering Committee* (NASC) was formed in 2004 to oversee the KAP II Project and reports to the Office of the President. This Committee has agency members from MFED, MELAD, MISA, MPWU, MFMRD, and MHMS and community members from the National Council of Churches, the Chamber of Commerce (representing the private sector) and a representative from the Women’s Committee (AMAK). A technical advisory sub-committee, the *Climate Change Study Team* (CCST), reports to NASC. This perhaps presents a model for the National Water Committee. As well, the Outer Island Project Coordination Committee (OIPCC) is a whole-of-government committee set up under MISA to coordinate outer island development projects. There is considerable membership overlap between NASC, OIPCC and the proposed NWSC. This overlap will provide strong linkage between water and sanitation planning, outer island development and adaptation planning and suggests some administrative efficiencies may be possible,

5.3 Community participation

While useful national consultations have been conducted through external projects to seek community help in identifying water and sanitation priorities, there is a general reluctance in government agencies to participate with community organisations and representatives in the design, planning management and protection of water resources. Instead the approach is to introduce regulations with stiff penalties for infringement. An examination of the past success of regulations to control behaviour, such as settlement on Water Reserves would suggest that they have limited effectiveness, particularly when enforcement is difficult. Instead, involving communities as partners would seem a more cost effective and successful technique but requires some coordinating body.

Management of water in outer island communities is carried out through water technicians attached to Island Councils. Each Island Council may represent up to 20 villages so that in some cases villages are seldom if ever visited by a water technician. There are no village-level water committees in rural areas to oversee water and sanitation issues. Such committees could provide local ownership and management of water supply systems but would require resourcing and advice.

Given the highly dispersed, rural, small villages scattered throughout the Republic's 21 atolls and islands across 3 million square kilometres of the Central Western Pacific, it is extremely doubtful if any centralised Ministry can deliver efficient and safe water surfaces at the village level without the participation and active involvement of villages and community ownership of the water supply systems. Resourcing potential village level water and sanitation committees presents a major challenge, particular for government Ministries that liaise with regional island councils. Currently only NGOs focus on village-level governance issues.

6. Identified Priorities

The above review provides the basis for summarising a list of policy priorities for the water and sanitation sector:

- Increase per capita supplies of safe freshwater to improve health;
- Control demands for water and decrease losses from reticulation systems and storages;
- Protect groundwater sources and rainwater stores from contamination;
- Improve sanitation;
- Increase rainwater harvesting;
- Increase community understanding of and participation in the water and sanitation sector;
- Move towards sustainable water supply systems;
- Improve assessment and monitoring of island freshwater resources;
- Increase capacity in water resources planning and management;
- Develop and implement appropriate technology for rural water supplies and sanitation services.
- Improve risk assessment for water resources to climate variability and change;
- Improve coordination in the water and sanitation sector;
- Review and improve legislation, policy, and administrative issues;
- Set the agenda for donor agencies and financing organizations in water resources and sanitation projects.

6.1 Governance issues

The above has revealed opportunities for improvements in the governance of the water sector in the Republic of Kiribati.

6.1.1 Linkages between society and water

Numerous community consultations in Kiribati and studies have demonstrated a well-developed understanding at all levels of the intimate linkages between society and water. Current water and sanitation policy however is *ad hoc* and fragmented and is not embedded within a framework of sustainable development. There is an urgent need for a National Water Policy to enunciate a national vision for water and sanitation and to provide a clear direction for government authorities and the community.

6.1.2 Water policy directed at society and water linkages

A clear, unified National policy provides an essential element in the framework for the conservation, sustainable use and management of any country's water resources and for the provision of safe and adequate water to its communities. National water policy at its best should enunciate the vision and hopes and aspirations of the people of Kiribati for the sector. Current water and sanitation policy however is *ad hoc* and fragmented and is not embedded within a framework of sustainable development. Existing policy consists of mainly unrelated Ministerial statements and Cabinet decisions and pronouncements which are inadequately documented and have no mechanisms for implementation.

6.1.3 Management systems to effectively implement policies

In order to implement policy, it is necessary to have in place appropriate management systems. Currently, three government departments have explicitly stated responsibilities in water and at least four others (see Fig 6.) have administrative responsibilities that impinge on the water sector. Although other agencies have activities in the water and sanitation sector, some may be without legislative basis. Previous projects and reviews have recommended improved coordination between government ministries and clearer definitions of roles in the water sector. In order to implement policy, it is also necessary to form partnerships with the community and industry. A National Water and Sanitation Coordination Committee is one mechanism for ensuring that coordination in the government sector occurs, that partnerships with community and industry are formed and that government policy is implemented. It is clear from the above that engagement of the community is required at all levels. One level overlooked is the village level where traditionally water management has been the province of extended families.

Other mechanisms necessary for the implementation of policy is the enactment of supporting water legislation and the development of government and community endorsed national water plans. Many of these issues require long term involvement and engagement.

The governance issues in the water and sanitation sector in Kiribati are clearly wide ranging and complex. Encompassing all key issues within the 10 month time frame of this project is not possible. One of the critical issues identified here is that governance projects need to be integrated, but above all long-term engagement if lasting change is to be achieved. However, with guidance from the key players in the water sector in Kiribati, the following priority pilot project options have been identified.

7. Design of Governance Pilot Projects

A simplified model of the policy cycle⁹ has been adopted in this work as an underpinning framework for this work (Fig. 7). In it the National Water and Sanitation Coordination Committee plays a central role in implementing policy, coordinating government agencies, reviewing policy outcomes and suggesting revisions.

The reestablishment of this Committee was therefore seen as a critical first project in the PFWG Kiribati case study and served also to act as a steering committee for the project. The other two

⁹ Bridgman, P. and Davis, G. (2004). The Australian Policy Handbook. 3rd Edition. Allen and Unwin, Sydney.

projects on developing draft national policy and totally revising the draft National Water Plan were then key components of the model in Fig. 7.

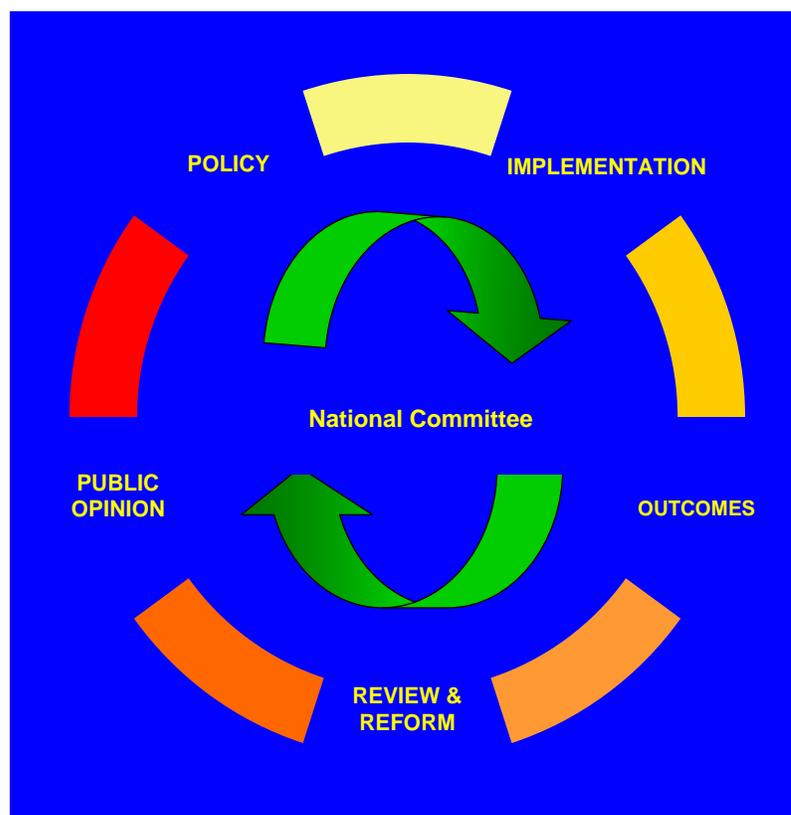


Fig. 7. Simplified model of the policy cycle used in this work showing the central role of the National Water and Sanitation Coordination Committee in implementing and reviewing policy.

7.1 Re-establish National Water & Sanitation Coordination Committee

Project Aim

To facilitate the re-establishment of the Kiribati National Water and Sanitation Coordination Committee

Tasks

- Review previous documents relevant to past National Committees.
- Identify factors which impeded the function of previous Committees.
- Interview key stakeholders about the need and function of a National Committee.
- Prepare a background briefing on the past operation and need for such a Committee.
- Propose a structure and *modus operandi* for the Committee.
- Prepare a general goal and terms of reference for the Committee.
- Discuss the terms of reference with stakeholders.
- Revise outputs.

Inputs

- Advice from key government agencies and community groups in the water sectors.
- Advice from key players in the sector in the Pacific.
- Relevant documents and reports.
- Critical review of background document and terms of reference.

Outputs

- Background document on the need for a National Water and Sanitation Coordination Committee, NWSCC.
- Draft document detailing the strengths, proposed mission, aims, terms of reference, coordination, reporting and composition
- Meetings with relevant stakeholders to discuss implementation

Resources

- Necessary reports.
- Time allocation by stakeholder personnel in Tarawa.
- Time allocation by key participants for review.

Anticipated Outcomes

- Improved appreciation of the importance of the NWSCC.
- Re-establishment of the whole-of-government and community NWSCC.
- Improved coordination, more transparency, openness and better collegiality in the water and sanitation sector.
- Involvement of the community in the sector at the National level.

This project approach was endorsed by all key stakeholders.

7.2 Draft National Water Policy**Project Aim**

To develop a first draft of the National Water Policy for discussion by the NWSCC.

Tasks

- Review previous documents relevant to water policy in the Pacific.
- Review past Cabinet and Ministerial statements on water and sanitation.
- Interview key stakeholders about the need for National Water Policy.
- Develop overall policy goals and policy intent statements.
- Prepare a rough draft National Water Policy.
- Circulate to all potential members of NWSCC.
- Circulate to reviewers.
- Revise after comments.
- Find a champion to promote National Water and Sanitation Policy.

Inputs

- Advice from key government agencies and community groups in the water sectors.
- Advice from key players in the sector in the Pacific.
- Relevant documents and reports.
- Critical review of rough draft policy.

Outputs

- First draft National Water and Sanitation Policy
- Meetings with relevant stakeholders to discuss features of the Policy.

Resources

- Necessary reports.
- Time allocation by stakeholder personnel in Tarawa.
- Time allocation by key participants for review.

Anticipated Outcomes

- Improved appreciation of importance of national water policy.
- A discussed and reviewed draft national policy.
- Clear strategic national directions and priorities in the water sector for the next 10 years for government agencies and the community.
- Improved confidence in the donor community.

This project approach was endorsed by all key stakeholders.

7.3 Revise the draft 2000 10 Year National Water Plan**Project Aim**

To completely revise the National Water Plan for discussion by the NWSCC using the draft National Policy as framework.

Tasks

- Review other Plans in the Pacific.
- Review the 1992 and revised 2000 Draft Plans.
- Interview key stakeholders about the need for a National Water Plan and the required features.
- Incorporate an analysis of the current performance in the delivery of water and sanitation services.
- Prepare a rough draft National Water Plan.
- Circulate to all potential members of NWSCC.
- Circulate to reviewers.
- Revise after comments.

Inputs

- Advice from key government agencies and community groups in the water sectors.
- Advice from key players in the sector in the Pacific.
- Relevant documents, plans and reports.
- Critical review of rough draft plan.

Outputs

- First draft National Water and Sanitation Policy
- Meetings with relevant stakeholders to discuss features of the Policy.

Resources

- Necessary reports and plans.
- Time allocation by stakeholder personnel in Tarawa.
- Time allocation by key participants for review.

Anticipated Outcomes

- Improved appreciation of importance of national water plans.
- A discussed and reviewed draft national plan.
- Clear understanding of the current situation.
- Full support for priorities and strategic national directions for the next 10 years from government agencies and the community.
- Improved confidence in the donor community.

- Improved public health.
- Improved access to water.

This project approach was endorsed by all key stakeholders.

8. Pilot Projects Results

8.1 National Water and Sanitation Coordination Committee

The proposed mission of the National Water and Sanitation Coordination Committee is to :

coordinate, facilitate and enhance Government and community activities in the water and sanitation sector to ensure that communities have access to water of suitable quality and appropriate quantities and to appropriate sanitation to meet all reasonable health, environmental, and development needs.

The proposed structure and composition of the committee is shown in Fig. 8. Note that four non-government organisations, National Council of Churches (NCC), KANGO, the umbrella NGO organisation in Kiribati, the Chamber of Commerce (CC) and the Kiribati Women's Federation (AMAK) are included in this proposed structure.

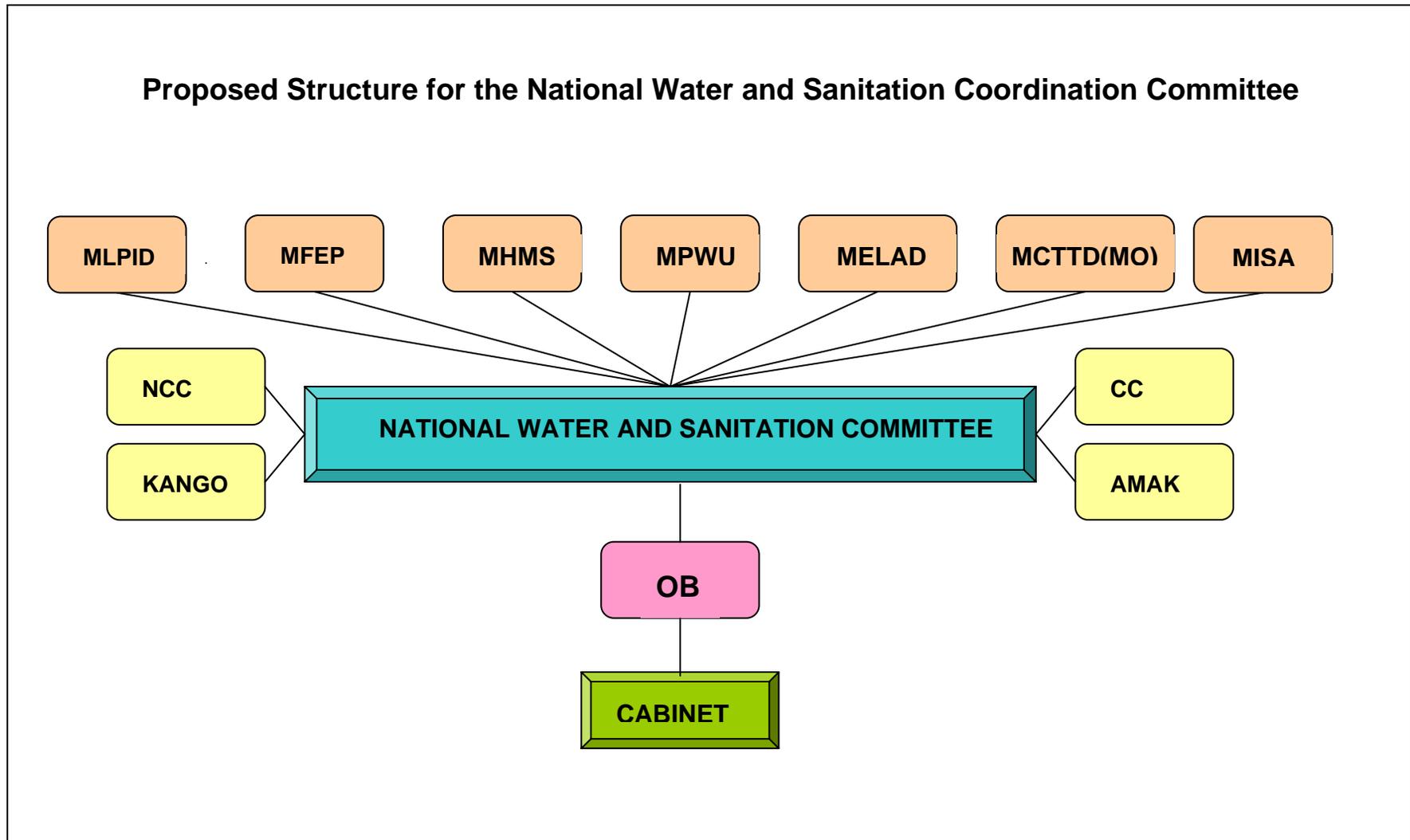
The suggested principle aims of the Committee are to:

1. Promote the sustainable management, conservation and use of water and related land resources by implementing Government policy and by coordinating and enhancing Government and community activities and involvement.
2. Facilitate and enhance initiatives to raise the quality of life by improving the quality and availability of safe water and decreasing illness and infant mortality rates due to water-borne diseases.
3. Coordinate and facilitate information gathering and assessment, policy and instrument development and review, and identification of other needs for the water and sanitation sector throughout Kiribati.
4. Provide broadly-based strategic advice to the Government of Kiribati, the community, non-government and donor organisations on the nation's water resources and sanitation service and their management and use.

The draft terms of reference for the Committee are to:

1. Coordinate and enhance the strategic activities of Government Ministries in the water and sanitation sector to ensure sustainable management.
2. Facilitate and coordinate the review and assessment of water and sanitation-related policies, regulations, plans, instruments and standards and make recommendations to Government on policy development, program implementation and potential improvements.
3. Provide the Government with broadly-based, coordinated, strategic advice on priorities for water and sanitation and on water-related development opportunities.
4. Provide a national forum for the discussion of water and sanitation-related issues.

Fig. 8. Proposed structure for the National Water and Sanitation Coordination Committee



5. Coordinate and facilitate an annual, national, island-based assessment report on the quality and quantity of water resources, water consumption, rainwater harvesting and demand for water and encourage strategic systematic monitoring.
6. Coordinate and facilitate assessments of risks in the water and sanitation sector and possible adaptation strategies in relation to global change and extreme events.
7. Enhance and coordinate strategies to improve community understanding of and participation in water and sanitation use and planning and in furthering water conservation and protection.
8. Coordinate the review and assessment of, and prioritise and make recommendations on proposals for water and sanitation-related projects.

It is planned that the Committee will provide the medium for integrated policy development and program implementation and for coordination and enhancement of information gathering, analysis and clearing; and dialogue and consultation on matters of policy, implementation and regulations content for the nationally vitally important water and sanitation sector.

At its inaugural meeting on 22 February 2007, the Committee chaired by the Secretary Ministry of Works and Utilities, adopted these suggested aims and terms of reference (subject to Cabinet approval) but rejected the inclusion of NGOs on the Committee since its main tasks were “government business”.

8.2 Draft National Water Policy

A draft National Water Resources Policy (NWRP), *Water for Healthy Communities, Environments and Sustainable Development* was produced to be consistent with previous policy decisions, and government statements. This Policy drew on water policy developments in Samoa. The NWRP provides the framework for the conservation, sustainable use and management of Kiribati’s water resources and for the provision of safe and adequate water to island communities. It represents the vision of the people of Kiribati for the water sector based on past national consultations.

The overriding policy goal is”

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

There is a clear policy intent here that safe freshwater is to be made available sustainable first to satisfy basic human needs, then those of the environment and finally those required for development.

Underneath that primary goal are a series of policy objectives which have measurable outcomes. The national water policy is intended to address priority concerns in both the short and long term. Expected outcomes from policy implementation are aimed at attaining sustainable management of water and related land resources with increased community participation and the sustainable delivery of safe water services.

Objective	Comments
1. To improve the safety of freshwater supplied from groundwater and rainwater systems.	Illness and death due to water-borne diseases are of great social and economic costs to the nation. Key elements are improving the protection of water sources, supplying simple, cost-effective methods for treating community water supplies and increasing community understanding of water quality and water treatment.
2. To protect fresh groundwater resources from adverse human impacts.	The protection of groundwater sources used for supporting communities is essential to the planning and management of groundwater supply systems in low islands. This involves questions of appropriate landuses, and appropriate regulatory and management strategies.
3. To sustainably manage all aspects of the use and conservation of freshwater.	Sustainable management and protection of freshwater and associated land resources and controlling demand are essential for addressing declining quantity and quality of water resources, developing environmentally responsible solutions and for guaranteeing future opportunities.
4. To improve knowledge of the quality and quantity of the nation's freshwater resources and demand for them.	To sustainably manage and use water resources it is essential to have reliable, up-to-date information on the stocks and flows of water, on its quality and on current and projected demand for water. A key step is monitoring and analysis
5. To improve knowledge and management of water resources under climatic extremes, variability and change.	To manage water and sanitation services during climatic extremes, such as droughts, heavy rains and storm surges, climate variability and climate change it is necessary to have information on the onset of extreme conditions and on adaptation strategies to address these threats
6. To improve outer island water supplies	Outer island water supplies require special attention. The provision of timely assistance, advice and training opportunities is essential
7. To increase community awareness and understanding of water resource and sanitation issues	Greater community awareness and better understanding of water resource and sanitation issues can lead to improvements in health, water conservation and improved participation.
8. To increase community participation in water resource and sanitation management.	Increased participation by the community is essential for strengthening community ownership of issues involved in water and sanitation systems, for supporting conservation strategies and for building partnerships between government agencies and the public in planning and decisions.
9. To increase the use of rainwater harvesting.	Rainwater is an underused resource despite existing building regulations. Increased use of rainwater can reduce risk of contamination, improve self-regulation of demand and increase resilience.

10. To develop instruments to help manage demand and allocation of water.	Controlling increasing demand and ensuring equitable allocation of water is an essential step in sustainable water management. A range of policy, regulatory and economic instruments are available to manage demand and allocation and to use water efficiently.
11. To review and revise, where necessary, all legislation, regulations and organisational responsibilities relevant to water and sanitation.	Improving the efficiency, transparency, responsiveness, and coordination of government institutions in water and sanitation will improve planning, services and partnerships with the community.
12. To ensure that people working in the water and sanitation sector have appropriate knowledge and skills.	Increasing the capacity of people working in the sector by fostering appropriate training schemes and training opportunities is a fundamental step for improving performance in the sector.
13. To ensure an adequate supply of trained personnel for the water and sanitation sector.	Human capacity limitations can affect the ability to manage water and sanitation services and water resources effectively. Identification of human resource needs and for succession planning are essential elements for increasing capacity.
14. To ensure cost effective planning, operation and maintenance of water supply and sanitation systems.	Effective planning operation and maintenance of water supply systems is essential to efficient service provision, the reduction of unaccounted for water losses, and cost recovery.

The anticipated outcomes are:

Expected outcomes of national water resources policy implementation
<p>Improved public health due to a decrease in water-borne diseases; Equitable access to safe freshwater; Sustainable water supply systems; Protection of freshwater resources from adverse impacts of human activities; Better knowledge of the quantity and quality of fresh water resources; Efficient allocation of water to various users; Improved risk assessment and management for the water sector; Greater public awareness of water resources issues; Enhanced water and sanitation educational programs; Increased stakeholder involvement in water protection of freshwater sources; Increased community participation in the conservation and management of water and water sources More effective governance, monitoring and assessment of water resources; Increased ability to respond quickly to water crises; Strengthened institutional and human capacity and the provision of appropriate training in the water sector; Clear identification of roles and responsibilities; Improved levels of cost recovery; Improved access to donor and loan schemes.</p>

The draft policy identifies a range of short to medium and longer-term strategies to achieve the policy objectives of the NWRP.

<p>1. Short to Medium Term</p>	<p>Formalise the terms of reference of the National Water and Sanitation Coordination Committee</p> <p>Review, develop and implement the 10 year National Water Master Plan including plans for both urban areas and outer islands.</p> <p>Develop a national water resource monitoring, assessment and reporting system.</p> <p>Carry out an assessment of the quantity and quality of national water resources.</p> <p>Assess the personnel and training needs in the water sector.</p> <p>Develop appropriate water quality guidelines.</p> <p>Develop rainwater harvesting and associated planning and building code guidelines.</p> <p>Develop an equitable loans scheme for rainwater systems.</p> <p>Develop a community and youth education and awareness programme for freshwater.</p> <p>Secure support for improvement to outer island water supplies.</p> <p>Develop a water pricing system for urban supplies.</p> <p>Review non-polluting sanitation systems.</p> <p>Develop indicators of improved water and sanitation management</p> <p>Identify personnel and training needs and sources of appropriate training.</p>
<p>2. Longer Term</p>	<p>Review, improve and initiate, where necessary, legislation and regulations relevant to freshwater and sanitation.</p> <p>Review and rationalise, where necessary the roles of government agencies in water and sanitation.</p> <p>Strengthen community participation in water resource management by establishing village level committees.</p> <p>Develop plans for the continual improvement of urban water and sanitation systems.</p> <p>Develop a training scheme for water and sanitation specialists.</p> <p>Develop a system to warn of climatic extremes and their impacts on water supplies.</p> <p>Develop legislation for the protection of groundwater resources.</p> <p>Identify human resource needs and develop capacity for water resource assessment , management and planning.</p> <p>Support and participate in regional and international water, climate and sanitation programmes.</p> <p>Review policy and implementation every 5 years.</p>

While the draft National Water Resources Policy has been circulated to all stakeholders in the water and sanitation sector it was not possible to consider it at the inaugural meeting of the National Water and Sanitation Coordination Committee because of the perceived urgency of the GEF IWRM proposal.

8.3 Draft 10 year National Water Resources Plan

A draft 10 year National Water Resources Plan *National Plan and Strategies for Sustainable Water Management and Use* has been developed. This is a major revision and extension of the 1992 draft National Water Plan and its revision in 2000. The draft “*National Plan and Strategies for Sustainable Water Management and Use*” describes plans and strategies to address identified priority needs in the water and sanitation sector in Kiribati. It is based on the framework developed in the Draft National Water Resource Policy “*Water for Healthy Communities, Environments and Sustainable Development*”.

The draft *National Plan and Strategies for Sustainable Water Management and Use* aims to respond to the identified priorities and government policy agenda in Kiribati’s water and sanitation sector and to provide a framework for the sustainable supply of appropriate quantities water of adequate quality and sanitation services to meet community, health, environmental and development needs and to benefit all I-Kiribati.

The draft National Plan framework elaborates specific strategies in order to guide the medium-term (10 year) development of the sector, and to provide a way of identifying how best the resources of the Government, NGOs, private sector, community organisations, donor and loan agencies may be best invested in technology appropriate to local circumstances.

It is intended that implementation of the Plan will be monitored and assessed through a set of indicators and milestones.

The overall objectives of the draft Plan are to:

- Implement Government policy in the water and sanitation sector
- Establish a basic framework for the orderly planning, development conservation and use of water resources and the provision of adequate sanitation services;
- Ensure sufficient quantity of good quality drinking water through the protection of water resources and safe disposal of human waste
- Establish sustainable water supply systems
- Increase community understanding of and participation in water and sanitation planning and management
- Establish a system for monitoring outcomes and the regular review and updating of the plan.

Five major tasks are identified in the draft Plan:

1. Improve understanding of water resources and their use
2. Increase access to safe and reliable water supplies.
3. Achieve sustainable water resource management
4. Increase community participation in water management and conservation
5. Improve governance in the water and sanitation sector.

A series of subtasks has been identified under each major tasks and measurable indicators of the success of these tasks and expected timeframes for their completion have been given.

Task and Subtask	Indicators
1. Improve understanding of water resources and their use	
1.1 Improve knowledge of the quality and quantity of the nation's freshwater resources.	Data base and reports to Cabinet of the quantity and quality of water available to island community water supplies and on potential threats to freshwater sources. This is a 20 year project consisting of 4 five-year phases which address assessment of island water resources in order of priority.
1.2 Improve understanding of water demand in urban and Outer Island situations and the capacity to pay for water.	Completed surveys and a summary report of case studies of water consumption, water sources and capacity to pay in a range of urban and Outer Island households. This is a two year project with data collected from selected priority areas.
1.3 Improve knowledge and management of water resources under climatic extremes and change.	Develop data base and summary reports to Cabinet on the impact of climate extremes on the availability of water in urban and Outer Island locations. Development of a system for warning the Government of possible droughts and water shortages. Two year project to establish data base with assistance from external agencies. Continuing responsibility for early warning.
1.4 Improve monitoring, data collection, storage, analysis and reporting of information.	Establish a data incorporating rainfall, water quality and water quantity in selected and expanding locations with annual reports to Government. Data base establishment one year project. Ongoing responsibility for monitoring and reporting
1.5 Improve understanding of the most effective ways of increasing community participation in the water and sanitation sector.	Review and summary report of methods of including community participation in water resource management. Recommendation to Government One year project
2. Increase access to safe and reliable water supplies	
2.1 Decrease the incidence of water-borne diseases.	A 30% decrease from 2005 levels of the number of diarrhoeal and dysentery cases by 2010 and a 50% decrease by 2015. On-going improvement with initial 5 year Phase I.
2.2 Improve the safety of freshwater supplied from groundwater and rainwater systems.	A 10% increase over 2005 levels in the percentage of the population with access to safe water sources by 2010 and a 20% increase by 2015. On-going improvement with initial 5 year Phase I.
2.3 Protect fresh groundwater resources from adverse human impacts.	Passing of Regulations detailing acceptable and proscribed activities in water reserves. Monitoring and reporting regimes established documenting the health of water reserves. The formation of Water Reserve Management Committees. Initial phase two years then an on-going project
2.4 Improve outer island water supplies.	A 10% Increase in the number of Outer Islanders with safe water supplies from protected water sources by 2010 and a 20% increase by 2015. On-going improvement with initial 5 year Phase I
2.5 Increase the use of rainwater harvesting.	Strategy developed to enforce building code for installation of rainwater tanks. Revolving loan fund established for Outer Islands. A 10% increase in the number of households with raintanks by 2010 and a 20% increase by 2015. Strategy developed and rolling fund established within one year. On-going improvement with initial 5 year Phase I.
2.6 Increase access to safe, basic sanitation.	A 10% increase over 2005 levels in the percentage of the population with access to safe sanitation by 2010 and a 20% increase by 2015. On-going improvement with initial 5 year Phase I.
3. Achieve sustainable water resource management	
3.1. Develop policies and instruments to help manage demand and allocation of	Development of national growth centre policies. Development of pricing systems for urban and outer Island water supply. Installation of domestic water meters in urban areas. Three year time frame

water.	
3.2. Develop effective leak detection and remediation programs.	Established leak detection program with annual reporting of performance. Initial development one year with on-going reporting
3.3. Identify sustainable groundwater extraction rates for public water supply systems.	Reports of successfully completed assessments. Initial 5 year phase but a projected 20 year program.
3.4. Identify acceptable land use practices for water source areas.	Reports from studies of the impact of land use on water sources. Recommendations from studies on acceptable and proscribed activities. Three year time frame.
3.5. Document the impacts of groundwater extraction.	Reports from studies of the impacts of pumping on land productivity. Inclusion of local communities in monitoring. Five year time frame.
3.6. Increase cost recovery for water supply systems.	Implementation of urban and rural cost recovery programs. Three year time frame
4. Increase community participation in water management and conservation	
4.1. Increase community awareness and understanding of water resource and sanitation issues.	Production of community and education programs and information materials. Formation of island water committees. Five year time frame but on-going activity
4.2. Facilitate Island Council and village level water and sanitation committees	Establishment of village level water committees with plumber and mechanic. Provide training and redefine role of island water technicians. One year time frame but on-going activity
4.3. Develop mechanisms for minimising conflicts over water resources	Published strategies and mechanisms for reducing conflict between village communities, between villages and between the community and government over water resources and supplies. One year time frame.
4.4. Include community representation at the national level in water and sanitation planning.	Establishment of The National Water and Sanitation Coordination committee with representation from NGO and community organisations. One year time frame for establishment but on-going.
4.5. Develop education programs for schools on safe water supplies and sanitation	Production of an education program that targets younger school students. Annual reports on the program One year time frame but on-going activity
5. Improve governance in the water and sanitation sector	
5.1 Review, revise and make recommendations on water and sanitation policy.	Announcement of a National Water and Sanitation Policy. One year time frame
5.2 Review and recommend procedures for implementing policy and monitoring implementation.	Review report on implementation and monitoring of policy to Cabinet. Effective procedure for reporting implementation of policy against targets. One year time frame but on going reporting of implementation
5.3 Review and revise, where necessary, all legislation, regulations and organisational responsibilities relevant to water and sanitation and to the declaration and protection of water reserves.	Report with recommendations to Cabinet One year time frame with 5 year reviews.
5.4 Improve coordination between agencies with responsibilities in the water and sanitation sector and with relevant community	Establishment of the National Water and Sanitation Coordination Committee. One year time frame with annual reviews.

organizations.	
5.5 Improve cost effective planning, operation and maintenance of water supply and sanitation systems.	Publishing of plans, operations and maintenance schedules. Annual task

The draft plan also specifies agencies responsible for the carriage of subtasks and a regular reporting schedule is suggested. The following table lists the suggested organisational responsibilities for the above objectives. The lead agency is listed first.

Objective	Responsibility
1. Improve understanding of water resources and their use	
1.1 Improve knowledge of the quality and quantity of the nation's freshwater resources.	MPWU(WEU), MHMS(EHU), , MLPID(PWD)
1.2 Improve understanding of water demand in urban and Outer Island situations and the capacity to pay for water.	MPWU(WEU & PUB), MISA, MFED, MLPID(PWD)
1.3 Improve knowledge and management of water resources under climatic extremes and change.	MCTTD(MO), MELAD(ECD), MPWU(WEU & PUB), , MLPID(PWD)
1.4 Improve monitoring, data collection, storage, analysis and reporting of information.	MPWU(WEU & PUB), MHMS(EHU), MISA, MCTTD(MO), MELAD(ECD), MLPID(PWD)
1.5 Improve understanding of the most effective ways of increasing community participation in the water and sanitation sector.	MISA, MELAD(EH), KANGO
2. Increase access to safe and reliable water supplies	
2.1 Decrease the incidence of water-borne diseases.	MPWU(PUB & WEU), MHMS(EHU), KANGO, MEYSD
2.2 Improve the safety of freshwater supplied from groundwater and rainwater systems.	MPWU(PUB & WEU), MHMS(EHU), MLPID(PWD)
2.3 Protect fresh groundwater resources from adverse human impacts.	MELAD(ECD), MISA, MPWU(WEU), MLPID(PWD), MEYSD, KANGO
2.4 Improve outer island water supplies.	MPWU(WEU), MLPID(PWD), MISA(RPU)
2.5 Increase the use of rainwater harvesting.	MPWU(WEU),
2.6 Increase access to safe, basic sanitation.	MHMS(EHU), MPWU(PUB), MLPID(PWD), MISA
3. Achieve sustainable water resource management	
3.1. Develop policies and instruments to help manage demand and allocation of water.	OB, MPWU(PUB & WEU), MISA, MLPID(PWD),
3.2. Develop effective leak detection and remediation programs.	MPWU(PUB), MLPID(PWD),
3.3. Identify sustainable groundwater extraction rates for public water supply systems.	MPWU(WEU), MELAD, MCTTD(MO),
3.4. Identify acceptable land use practices for water source areas.	MELAD(ECD), MISA, KANGO
3.5. Document the impacts of groundwater extraction.	MELAD(ECD), MPWU(PUB & WEU), KANGO
3.6. Increase cost recovery for water supply systems.	MFEP, MPWU(PUB & WEU), MLPID(PWD), MISA, KANGO
4. Increase community participation in water management and conservation	
4.1. Increase community awareness and understanding of water resource and sanitation	MISA, KANGO, MPWU(WEU), MHMS(EHU), MEYSD

issues.	
4.2. Facilitate Island Council and village level water and sanitation committees	KANGO, MISA, MHMS(EHU)
4.3. Develop mechanisms for minimising conflicts over water resources	MISA, KANGO, MELAD, MPWU(WEU)
4.4. Include community representation at the national level in water and sanitation planning.	OB, MISA, KANGO
4.5. Develop education programs for schools on safe water supplies and sanitation	MEYSD, MPWU(PUB & WEU)
5. Improve governance in the water and sanitation sector	
5.1 Review, revise and make recommendations on water and sanitation policy.	OB, NWSCC
5.2 Review and recommend procedures for implementing policy and monitoring implementation.	OB, NWSCC
5.3 Review and revise, where necessary, all legislation, regulations and organisational responsibilities relevant to water and sanitation and to the declaration and protection of water reserves.	AGO, OB, NWSCC
5.4 Improve coordination between agencies with responsibilities in the water and sanitation sector and with relevant community organizations.	OB, NWSCC
5.5 Improve cost effective planning, operation and maintenance of water supply and sanitation systems.	OB, NWSCC

While the draft National Water Resources Plan has been circulated to all stakeholders in the water and sanitation sector it was not possible to consider it at the inaugural meeting of the National Water and Sanitation Coordination Committee because of the perceived urgency of the GEF IWRM proposal.

8.4 Project Achievements

The Government of Kiribati re-established the National Water and Sanitation Coordination Committee on 22 February 2007. The Committee adopted in principle the suggested aims and terms of reference (subject to Cabinet approval) for the National Committee.

The draft National Water Resources Policy and draft 10 year Water Resources Plan were widely circulated and will be further pursued under the KAPII Water Component Project 3.1.1. A summary of the achievements is:

- Developed Aims and objectives, terms of reference for the National Water and Sanitation Coordination Committee.
- Inaugural meeting of the National Water and Sanitation Coordination Committee held on 22 February 2007 (see Fig. 9 & 10) ratified in principle the proposed goals, objectives and terms of reference.
- Draft National Water Resources Policy developed and circulated.
- Draft 10 year National Water Resources Plan developed and circulated.

- Draft National Water Resources Policy and Plan used as the basis for a 6-year 5.491M€ Proposal for Support to the EU European Development Fund, EDF10 *Safe and Sustainable Water Supplies and Sanitation for Rural and Outer Island Areas in the Republic of Kiribati* .
- Draft National Water Resources Policy and Plan used as the basis for the GEF IWRM Diagnostic Report, Hot Spot Appraisal and the development of a 5 year \$US 0.5M Demonstration Concept Project.



Fig. 9. Inaugural meeting of the National Water and Sanitation Coordination Committee, Betio, Tarawa, Kiribati on 22 February 2007. The chair of the Committee on the left is Reina Timau Tiinga, Secretary of the Ministry of Public Works and Utilities, with representatives from the PUB, the WEU and the KAPII Office.



Fig. 10. Inaugural meeting of the National Water and Sanitation Coordination Committee, with representatives (from the left) from Ministry of Fisheries & Marine Resources Development, MELAD, the Met Office and the chair on the left is Reina Timau Tiinga, Secretary of the Ministry of Public Works and Utilities.

8.5 Outputs: reports, documents and papers

The pilot has produced the following written reports, documents and papers:

Report	Content
The Case For the National Water & Sanitation Coordination Committee	Discussion document for circulation amongst key stakeholders to raise awareness of the advantages of a whole-of-government approach.
Coordination of the Water and Sanitation Sector: Background To The Kiribati National Water And Sanitation Coordination Committee.	Discussion document for circulation amongst key stakeholders to highlight previous approaches to the coordination of the water and sanitation sector in Kiribati and to identify lessons learnt.
The National Water & Sanitation Coordinaton Committee: Strengths, Proposed Mission, Aims, Terms of Reference, Coordination, Reporting and Composition	A discussion paper proposing the mission, aims terms of reference, coordination, responsibilities and reporting and suggested composition of the National Water and Sanitation Coordination Committee
Long Term Water and Sanitation Priorities In Kiribati for Potential Support Under EU EDF10	A document developed for the Government of Kiribati, based on research undertaken for the PFWG pilot project identifying long term priorities for possible funding under EU EDF10
Sustainability of Water and Sanitation Services in South Tarawa, Kiribati	This is a summary of issues critical to the sustainability of the water and sanitation services and the associated risks in the densely urbanised South Tarawa, Republic of Kiribati, which has one of the highest incidences of water-borne diseases in the Pacific. It was developed from research conducted for the EU PFWG project and was circulated to donor agencies.
Water for Healthy Communities, Environments and Sustainable Development: Draft National Water Resources Policy.	This sets out the purpose, consistency, previous references. Policy goal, policy objectives and intended outcomes of National Water Resources Policy and was prepared for consideration by the National Water and Sanitation Coordination Committee.
National Plan and Strategies for Sustainable Water Management and Use: Draft 10 Year Water Resources Plan	This Plan uses the framework of the Draft National Policy to identify priorities in the water and sanitation sectors and to identify achievable tasks, timeframes and responsibilities to address those priority concerns. It was prepared for consideration by the National Water and Sanitation Coordination Committee.
Proposal for Support EU European Development Fund, EDF10, Safe and	This proposal for a 6 year 5.5M € project was developed using the draft National Water Resources Plan developed under PFWG. It was

Sustainable Water Supplies and Sanitation for Rural and Outer Island Areas in the Republic of Kiribati.	developed for the Government of Kiribati for submission to EU.
Global Environment Facility (GEF) Project Development Facility Block B. Sustainable Integrated Water Resources and Wastewater Management in Pacific Island Countries. National IWRM Diagnostic Report, Republic of Kiribati	This report was developed using the draft National Water Resources Plan developed under PFWG. It was prepared for the GOK and for SOPAC for submission to GEF
GEF IWRM Demonstration Project Concept Paper for the Pacific Country the Republic of Kiribati : Protection And Management off Shallow Groundwater Sources For South Tarawa	The 5 year \$US 0.5M project was prepared using research undertaken for the PFWG in Kiribati. It was prepared for the GOK for transmission to SOPAC and to GEF.
Trial Of Low Cost Membrane Filtration Treatment Of Drinking Water In Pacific Small Island Countries.	The review of priorities in the rainfed island of Banaba, Kiribati for EU PFWG identified the urgent need for low cost, easily operated and maintained membrane filtration systems to filter out bacteria, sediment and algae from water supplies. This proposal was submitted to SOPAC for possible funding for Pacific island nations.
Society-Water Cycle Interactions in the Central Pacific: Impediments To Meeting The UN Millennium Goals for Freshwater And Sanitation	Paper published in RIHN 1 st <i>International Symposium Proceedings – Water and Better Human Life in the Future- 6-8 Nov 2006</i> , RIHN, Kyoto, pp 41-52
Kiribati Water Governance Milestone Report 1: Activities 1 and 2	First milestone report this project June 2006
Kiribati Water Governance Milestone Report 1: Activities 3 and 4	Second milestone report this project September 2006
Republic Of Kiribati Pilot Project A Whole-of-Government Approach to Water Policy and Planning Final Report	Final report this project September 2007
Climatic and Human Influences on Groundwater in Low Atolls	Paper published in <i>Vadose Zone Journal</i> . 6:581–590 (August 2007)
Challenges in freshwater management in low coral atolls.	Paper published in <i>Journal of Cleaner Production</i> , 15: 1522-8 (2007)

9. Consistency and Linkages with Other Priorities & Initiatives

9.1 UN Priorities in Water

The UN General Assembly, in its Millennium Declaration in 2000, resolved “to halve by the year 2015 the proportion of the world’s population who are unable to reach or afford safe drinking water” and “to stop the unsustainable exploitation of water resources”. The World Summit on Sustainable Development in Johannesburg in 2002 also set a new target of “halving the proportion of people who do not have access to basic sanitation by 2015”. These global goals are particularly relevant to small island nations in the Pacific and this project has developed governance instruments aimed at providing safe water supplies and adequate sanitation for island communities..

9.2 European Consensus on Development

The primary and overarching objective of European Development Cooperation is to eradicate poverty in the context of sustainable development, including pursuit of the Millennium Development Goals (MDGs). Four of the eight MDGs: reducing the mortality rate of children; improving maternal health; combating HIV/AIDS, malaria and other diseases; and ensuring environmental sustainability are central to work undertaken in this project.

The European Community (EC) has decided to focus on areas where it has a comparative advantage including: *The environment and the sustainable management of natural resources: Infrastructure, communications and transport*; and *Water and energy*, most of which are central to this proposal. In the water context the EC aims at ensuring a supply of sufficient, good quality drinking water, adequate sanitation and hygiene to every human being, in line with the MDGs and the targets from Johannesburg. Further, it aims at establishing a framework for long term protection of all water resources, preventing further deterioration and promoting sustainable water use. These are the aims have been incorporated into this project.

The EC Strategy for the Pacific reaffirms the primary objective of poverty eradication and focuses on specific priorities in the Pacific for EU intervention. The focal areas for the Pacific are *Regional Economic Integration, Sustainable Management of Natural Resources, and Non-Focal Sector*.

9.3 Pacific Regional Initiatives

The Pacific Regional Action Plan (RAP) on sustainable water management, which is being incorporated into the Pacific Plan, was endorsed by all Pacific countries in 2003 at Pacific Ministerial and Heads of State level in Auckland, New Zealand. The Pacific RAP on sustainable water management aims to increase access to safe water, improve the assessment and monitoring of water resources, to reduce water pollution, improve access to technologies, strengthen institutional arrangements, and leverage additional financial resources for improved water supplies. The Action Plan called for broadly-based national water visions, design of capable institutions, national water action agenda and plans, empowerment of communities, and integrated investment plans. It recognised that both behavioural change and long term collaboration and partnerships between governments and communities were essential for improvement. This project has been developed using these objectives.

9.4 In-country Projects

9.4.1 AusAID, NZAid and World Bank KAPII Water Component

The KAPII Water Component relies on the existence of a National Water Resources Committee to steer water projects within the water component. This committee has been established within the EU PfWG pilot project. Two key activities with KAPII are the development of National Water Policy and National Water Plans. The basic groundwater for these has been prepared under EU PfWG.

9.4.2 EU EDF10 Project Proposal for Kiribati

The Draft National Water Resource Policy and Plan developed here under EU PfWG were used to identify priority projects for potential funding in Kiribati under EU EDF10. Projects over 6 years totally 5.5M€ were developed.

9.4.3 GEF Sustainable IWRM in Pacific Island Countries.

The Draft National Water Resource Policy and Plan developed here under EU PfWG were used

to develop a Diagnostic Report for Kiribati and to develop a Demonstration Concept Project for submission to SOPAC and GEF.

9.4.4 Skyhydrant Membrane Treatment System for Developing Country Water Supplies

The research and reviews undertaken for the EU PFWG pilot project revealed the pressing need for need for low cost, easily operated and maintained membrane filtration systems to filter out bacteria, sediment and algae from water supplies in small island water supply systems, particularly in Banaba. A project proposal to introduce and train small island water technicians in the use of this technology was prepared and submitted to SOPAC.

10. Difficulties in Project Implementation

10.1 Leadership of the Committee

The proposal to place the National Water and Sanitation Coordination Committee directly under the Office of the President through the National Strategic Policy and Risk Assessment Unit was done to reduce rivalry, to promote collaboration between Ministries with responsibilities for water and to have a direct means of reporting to Cabinet. Unfortunately NSPRAU, within the Office of the President was unable to assume leadership of the Committee because the National Strategic Policy and Risk Assessment Unit has remained unstaffed since the completion of the Technical Advisor's secondment. The Secretary of the Ministry of Works and Utility, the designated lead National Water Agency, was able to take the chair, however, this may have rekindled some of the tensions between rival Ministries.

10.2 Membership of the National Committee

Four non-government organisations, the National Council of Churches (NCC), KANGO, the umbrella NGO organisation in Kiribati, the Chamber of Commerce (CC) and the Kiribati Women's Federation (AMAK) were included in the proposed structure of the NWRSCC. These were included to broaden the outlook of the committee since the entrainment of the community is vital to the success of any governance reforms. At its inaugural meeting on 22 February 2007, the Committee rejected the inclusion of NGOs on the Committee since they perceived that the main tasks of the Committee were "government business". There are however at least two good models in Kiribati of whole-of-government committees which include community representatives.

10.3 Technical capacity and the impact of external project proposals

There are only two or three senior water resources experts in Kiribati. When opportunities to prepare proposals for large, externally-funded water resource projects arise, their energies are diverted from existing commitments. During the course of this pilot project, both the AusAID, NZAid KAPII *Water Component* Proposals and the Global Environment Facility *Sustainable Integrated Water Resources and Wastewater Management in Pacific Island Countries* were introduced in Kiribati. This led to diversion of effort and focus, so instead of considering, discussing and amending the draft National Policy and Plans, the National Water and Sanitation Coordination Committee spend its efforts in reviewing Diagnostic Reports, Hot Spot Analyses and Draft Concept Pilot projects. Donor agencies need to be aware of the very limited human resources in small island states and of their potential diversion from vital or strategic business by external proposals.

11. Future Governance Projects

This project has sought to analyse the governance needs in Kiribati and to address some of those needs amenable to solution within the short 10 month timeframe of the project. It elected to seek the re-establishment of a National Water and Sanitation Coordination Committee to coordinate and oversee water projects and to start the preparation of draft policy and the revision of draft 10 year National Water Plans. While these were achieved there are many more governance issues that need to be addressed. The following describes some of the outstanding issues to be addressed.

11.1 Adoption of policy and plans

Both the National Policy and 10 Year Plans have yet to be adopted by the Government of Kiribati. Given that a Draft National Water Plan has been in existence for 13 years, this step may require a determined effort part of which will be pursued under KAPII Water Component 3.1.1.

11.2 Revision and passing of national water legislation

A draft National Water Legislation Act has been with the Attorney General's since 1992. A review of the Act and the impediments to its progression to parliament is urgently required as is a review of the statutory bases for government agencies involved in the water and sanitation sector.

11.3 Protection of groundwater sources for public supply

While regulations exist for the protection of groundwater sources for public water supplies in South Tarawa, it is uncertain if companion regulations exist for the protection of water sources in outer island and rural areas. In addition, experience has shown that existing legislation is relatively ineffective in protecting groundwater sources, due to enforcement problems and the sensitivity of issues concerned with land ownership. An alternate model has been proposed of encouraging land owners to be custodians of the resource. The issues and connected with and the appropriate mechanisms to foster this stewardship proposition have yet to be explored.

11.4 Partnering the community in water management

This project only tackled the question of community participation in water management in a peripheral way and at the national level. In other island countries there appears to be a great strength in village level water committees for controlling the extraction, distribution, conservation, protection and use of groundwater. These could have a significant benefit at the local level.

11.4 Succession planning and training

It has been emphasised here that the issues faced in water and sanitation in Pacific Small Island Countries are amongst the most difficult in the world. Few tertiary organisation provide appropriate training for the diversity of tasks faced by a small island water resource specialist. Given growing demands, shrinking resources and the impacts of global change, this is the more so. Careful thought needs to be given, perhaps at the regional as well as country levels, to both succession planning and staff training.

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