

SOLOMON ISLANDS

NATIONAL WATER AND SANITATION SECTOR PLAN

An integrated water resource management, Water and Sanitation Sector Plan to implement the water and sanitation sector goals of the Solomon Islands National Development Strategy 2011-20.

The Plan's overall vision is for "Safe, protected and well-managed water sources, water supply and hydro-power systems, wise water use and well-managed sanitation and waste disposal systems for the health, beneficial use and development of all Solomon Islanders and for sustaining our unique ecosystems, now and in future."

GUD WATA HEM PRESIS FO EVRIWAN WATA HEM LAEF EVRIWAN MAS LUK AFTAREM WATA

Draft June 2013



Figure 1 The provinces and islands of Solomon Islands (<u>http://www.lib.utexas.edu/maps/cia12/solomon_islands_sm_2012.gif</u>)

This Integrated Water Resources Management (IWRM) National Water and Sanitation Sector Plan was developed by the Cabinet-appointed **National Intersectoral Water Coordination Committee** (NIWCC) which reports through Minister of Mines, Energy and Rural Electrification to Cabinet of the Government of Solomon Islands (GoSI). Its development was supported by the **Secretarial of Pacific Countries (SPC) Applied Geoscience Division (SOPAC)** under the **Pacific IWRM National Planning Programme** in a process facilitated by Professor Ian White of the Australian National University. Development of the plan was based on the principles of integrated water resource management in island counties, water use efficiency and adaptation to climate change.

The NIWCC is chaired by the Permanent Secretary, Ministry of Mines, Energy & Rural Electrification (MMERE) or his delegate and includes representatives from:

Water Resources Division (WRD), MMERE Geology Division, MMERE Ministry of Agriculture and Livestock (MAL) Ministry of Development Planning & Aid Coordination (MDPAC) Ministry of Finance and Treasury (MFT) Fisheries Division (FD), Ministry of Fisheries and Marine Resources (MFMR) Commissioner of Forest, Ministry of Forest Development & Research (MFDR) Ministry of Environment, Conservation, Meteorology and Disaster Management (MECMDM) Environmental Health Division (EHD), Ministry of Health and Medical Services (MHMS) Commissioner of Land, Ministry of Lands, Housing and Survey (MLHS) Ministry of Provincial Government and Institutional Strengthening (MPGIS) Solomon Islands Development Trust (SIDT) General Manager, Solomon Islands Water Authority (SIWA) now Solomon Water (SW) Solomon Islands Christian Association (SICA) Ministry of Women, Youth & Children Affairs, (MWYCA)

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Acronyms and Abbreviations

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
BoM	Bureau of Meteorology (Australia)
CBO	Community-based Organisation
EC	The European Community
	Environmental Health Division MHMS
ENSO	El Niño Southem Oscillation
EU	I ne European Union
FD	Fisheries Division, MFMR
GDP	Gross domestic product
GSI	Government of the Solomon Islands
ha	hectare (= 10,000 m ²)
IWRM	Integrated Water Resources Management
kL	kilolitre (= $1,000L = 1 \text{ m}^3$)
L	litre
L/pers/day	litre per person per day
m	metre
m ²	square metre
m ³	cubic metre (= $1,000 \text{ L} = 1 \text{ kL}$)
ML	megalitre (= $1.000.000 \text{ L} = 1.000 \text{ kL} = 1.000 \text{ m}^3$)
mm	millimetre (= 0.001 m)
MAI	Ministry of Agriculture and Livestock
MDG	Millennium Development Goals (LIN)
MDPAC	Ministry of Development Planning & Aid Coordination
MECMDM	Ministry of Environment, Conservation, Meteorology & Disaster Management
	Ministry of Errort Development and Research
	Ministry of Folest Development and Research
	Ministry of Fishenes and Troopury
	Ministry of Finance and Treasury
	Ministry of Health and Medical Services
MLHS	Ministry of Lands, Housing and Survey
MMERE	Ministry of Mines, Energy and Rural Electrification
MPGIS	Ministry of Provincial Government and Institutional Strengthening
MWYCA	Ministry of Women, Youth & Children Affairs
NDS	National Development Strategy 2011-2020
NDMO	National Disaster Management Office, MECMDN
NIIP	Draft National Infrastructure Investment Plan 2013
NWSHIP	National Water and Sanitation Plan (this Plan)
PACC	Pacific Adaptation to Climate Change
PCCSP	Pacific Climate Change Science Program
pers	persons
PIC	Pacific Island Country
PWA	Pacific Water Association
RAP	Pacific Regional Action Plan for Sustainable Water Management 2003
RO	Reverse osmosis (desalination)
SICA	Solomon Island Christian Association
SIDT	Solomon Islands Development Trust
SIWA	Solomon Islands Water Authority (now Solomon Water)
SOF	State-owned-enternrise
SOL	Southern Oscillation Index
SORAC	Applied Geoscience Division of the SPC
SOFAC SDC	Secretariet of the Desifie Community
	Secretariat of the Facilit Continuinty
	Sea Sundue lemperature Selemen Water (formerly Selemen Jalande Water Authority)
	Solomon vvater (formerly Solomon Islands water Authority)
UN	United Nations
USP	University of the South Pacific
WASH	Water Sanitation and Hygiene
WB	World Bank
WRD	Water Resources Division (MMERE)

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Solomon Islands

National Water and Sanitation Sectoral Plan

Part I

Purpose, Theme and Vision

Title: National Water and Sanitation Sector Plan

1 Purpose of this Plan

The National Water and Sanitation Sector Plan (NWSSP) is the ten-year plan to implement the goals and objectives in Solomon Islands **National Development Strategy 2011-20** (NDS) and other Government initiatives and strategies, including the Draft National Infrastructure Investment Plan 2013 (NIIP), that focus on the national water and sanitation sector. The NDS found that, in consultations: **Water Supply and Sanitation** were considered to be the **highest priority concern** in both rural areas and urban centres throughout Solomon Islands. Communities expect the Government to respond to these concerns.

The purpose of this plan is to:

- 1. respond to wide-spread concerns about water supply and sanitation
- 2. set-out activities to implement water and sanitation sector objectives in the NDS and in related Government policies, initiatives and strategies and to address priority sector issues
- 3. identify performance indicators for activities and methods for monitoring performance
- 4. assign responsibilities for carrying out activities
- 5. mainstream good governance, integrated water resource management, water use efficiency and climate change adaptation, and
- 6. give a timetable for implementing activities

2 Values Underpinning this Plan

Water is everyone's business. The theme for this Plan is a statement of fundamental values about good quality freshwater accepted throughout Solomon Islands. It is in plain language that everyone can identify with and understand. The theme focuses community attention and particularly that of children on the central importance of good quality water, its care and conservation. The provisional theme developed by the Cabinet-appointed National Intersectoral Water Coordination Committee (NIWCC) for this Plan is:

GUD WATA HEM PRESIS FO EVRIWAN WATA HEM LAEF EVRIWAN MAS LUK AFTAREM WATA Good water is precious for everyone Water is life Water is everyone's responsibility

3 Vision Statement

This Plan builds on water and sanitation-related objectives in the NDS and other Government of Solomon Islands (GoSI) policies, initiatives, strategies and reports and fulfils GoSI's international and regional obligations. In keeping with the all-pervasive importance of water to human health and well being, to economic development, our unique ecosystems and our diverse cultures, the NIWCC adopted a broad provisional vision statement for this plan:

"Safe, protected and well-managed water sources, water supply and hydro-power systems, wise water use and well-managed sanitation and waste disposal systems for the health, beneficial use and development of all Solomon Islanders and for sustaining our unique ecosystems, now and in future."

This vision is based on the principles of: integrated water resource management (IWRM), managing from ridge to reef and engaging community to Cabinet in the process; water use efficiency; and adaptation to climate and global change.



Solomon Islands

National Water and Sanitation Sectoral Plan

Part II

Relation to the NDS, draft NIIP and other Government Initiatives

4 Relation of this Plan to the NDS and draft NIIP

The relation of the National Water and Sanitation Sector Plan to the NDS, the draft NIIP and related planning and budgetary processes is shown in Figure 2. Sector strategic plans are mandated under the NDS.



Figure 2 Relation of the National Water and Sanitation Sector Plan (blue) to the NDS (green) and the draft NIIP (yellow) as well as to other elements of the NDS planning and budgetary processes (adapted from draft NIIP).

The four focus areas and eight associated objectives of the NDS are listed in Table 1

Focus Area	Objective	
To Build Better Lives for All Solomon	1. Alleviate Poverty and Improve the Lives of Solomon	
Islanders	Islanders in a Peaceful and Stable Society	
	2. To Support the Vulnerable.	
	3. Ensure that all Solomon Islanders have Access to	
Taking Better Care of All the People of	Quality Health Care and Combat Malaria, HIV, Non-	
the Solomon Islands	communicable and Other Diseases	
	4. Ensure all Solomon Islanders can Access Quality	
	Education and the Nation's Manpower Needs are	
	Sustainably Met.	
· · · · · · · · · · · · · · · · · · ·	5. Increase Economic Growth and Equitably Distribute	
Improving Liveliboods of All the Beople	Employment and Income Benefits	
of the Solomon Islands	6. Develop Physical Infrastructure and Utilities to Ensure	
	all Solomon Islanders have Access to Essential	
	Services and Markets	
	7. Effectively Respond to Climate Change and Manage	
	the Environment and Risks of Natural Disasters	
Creating the Enabling Environment	8. Improve Governance and Order at National,	
	Provincial and Community Levels and Strengthen Links	
	at All Levels	

Although the NDS assigns the main tasks in water and sanitation to the infrastructure

components of Objective 6 in Table 1, good quality and adequate supplies of water and appropriate sanitation underpin all the focus areas and objectives of the NDS.

4.1 Relation to NDS sub-focus area policies

The NDS gives a number of policy statements for sub-focus areas under each objective listed in Table 1. Policy statements with relevance to the water and sanitation sector are listed in Table 2.

Table 2 Sub-focus areas and policy statements from the NDS which are relevant to the water and sanitation sector

Objective	Sub-Focus Area	Policy Statement
1	Poverty Alleviation and Rural Livelihoods	Develop and implement programs to alleviate poverty based on improved market access and a vibrant smallholder sector through sustainable natural resource use and commercial activities in rural and remote areas.
ľ	Social and Community Development	Improve equity in social service provision and develop the capacity of communities identify and address their needs.
	National Population Policy	Manage the rate of population growth to build and sustain the prosperity of the families and communities in the Solomon Islands (National Population Policy)
2	National Food Security, Food Safety and Nutrition Policy	Provide food security, food safety, and nutrition to improve the livelihoods or both rural and urban communities in the Solomon Islands (National Food Security, Food Safety and Nutrition Policy)
3	Health Service Provision	Provide quality health services for all the people of the urban and rural areas of the Solomon Islands so that they will be healthy, happy and productive.
4	National Education Policy	That all Solomon Islanders will develop as individuals and possess the knowledge, skills and attitudes needed to earn a living and to live in harmony with other people and their environment
	Human Resources Development and Employment	Ensure that the education and training system supports economic and social development so that Solomon Islanders with the required skills and attitudes will be available to satisfy local and international labour market demand.
5	Development of Economic Growth Centres	Provide infrastructure and services to promote investment in Growth Centres and increase the opportunities for rural dwellers to engage in the formal sector, enhance economic growth and improve their standard of living
	Development of Natural Resource Based Sectors	Promote sustainable use of natural resources to increase production, productivity, value added and rural incomes.
	Water Supply & Sanitation	Improve water supplies and sanitation in urban and rural areas in terms of quality, reliability and coverage.
6	Energy Sector Planning and Management	Ensure availability and efficient use of energy to achieve development goals of improving the livelihood and quality of life for all the people in the Solomon Islands
7	Climate Change and Environmental Protection	To integrate national environmental issues in a holistic way so as to adapt to climate change and variability, halt deterioration of the eco-systems, restore damaged ecosystems and ensure their survival in the long term to benefit Solomon Islanders.
	Natural Disaster Risk Reduction and Management	Continually develop and maintain measures to support communities in reducing their risks and managing consequences of disasters
8	Finance	Improve standards of Finance governance and service delivery by public servants performing to the highest professional standards in government operations restructured to improve efficiency and effectiveness within approved budgets to better serve all Solomon Islanders.
	Provincial and Community Levels	Strengthen the role and capacity of Provincial government and improve their human resources, facilities and systems at provincial constituency and ward levels to more effectively represent and serve their communities.

These policy statements are further built on and expanded in this sector Plan.

5 Consistency of this Plan with other Government Initiatives

Solomon Islands has a long history of policies, plans, strategies, frameworks, analyses and reports on the water and sanitation sector. In developing this Plan the NIWCC has reviewed these to ensure the Plan is consistent with current Government initiatives such as the NDS and draft NIIP and that it builds on the many past initiatives. The NIWCC has reviewed the policies, legislation plans and analyses relevant to the water and sanitation sector listed in Table 3 in developing this plan.

Table 3 Policies, legis	slation, plans and	analyses used in the c	levelopment of this Plan
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Category	Title		
Policies	Draft Climate Change Policy 2012 Draft Rural Water Supply and Sanitation Policy 2012 Draft National Water Policy 2007		
Legislation Draft Water Resources Bill 2006 Environmental Health Act 1998 Minerals Act 1996 Solomon Islands Water Authority Act 1992 Land Titles Act 1969 Forestry Act 1969 River Waters Act 1968			
Plans & Strategies	Draft National Infrastructure Investment Plan 2013 Solomon Water (formerly Solomon Islands Water Authority) Development Plan 2013- 2015 National Disaster Management Plan 2011 National Development Strategy 2011-2020 Waste Management Strategy and Action Plan 2009-14 National Adaptation Plan of Action 2009 Waste Management Strategy and Action Plan 2009-14 National Disaster Management Plan 1997 (Revised edition)		
Reports & Analyses	Solomon Islands Water, Sanitation and Climate Outlook 2011 Climate Change in the Pacific: Scientific Assessment & New Research 2011 Water and Sanitation Programme Mission Report to the Solomon Islands, SPC- SOPAC, 2011 Mission Report: Joint Nationasl Action Plan for Disaster Risk Management and Climate Change, Solomon Islands, SPC-SOPAC Internal Report 64, 2011 Solomon Islands: Staff Report for the 2011 Article IV Consultation, Third Review, IMF, 2011 Report on Water Security and Vulnerability to Climate Change and Other Impacts in Pacific Island Countries and East Timor. For Pacific Adaptation Strategy Assistance Program, Department of Climate Change and Energy Efficiency, GHD Pty Ltd, 2011 Climate Change in the Pacific: Scientific Assessment and New Research. Volume 1: Regional Overview. Pacific Climate Change Science Program, Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation, Melbourne, 2011 Climate Change in the Pacific: Scientific Assessment and New Research. Volume 2: Country Reports. Pacific Climate Change Science Program, Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation, Melbourne, 2011 Solomon Islands-IWRM Diagnostic Report 2007 Honiara City Water Loss Management, Sectorisation, Metering and Logging Programme – Stage 1, SOPAC Report 401, 2007 Solomon Islands Technical Mission Report Water Quality Monitoring & Water Demand Management, Honiara, SOPAC, 2006 UNDP Human Development Report 2006 National Consultations Solomon Islands, PIEPSAP Report, SOPAC, 2004 Solomon Islands - European Community Country Strategy Paper and National Individue Programme for 2002		

6 Solomon Islands' International and Regional Obligations

Solomon Islands is signatory to many regional and international conventions/agreements and has obligations to fulfil. It has particular international obligations under the UN General Assembly's Declaration in 2000 of the Millennium Development Goals particularly concerning water "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", and on sanitation through the World Summit on Sustainable Development in Johannesburg in 2002 target of "halving the proportion of people who do not have access to basic sanitation by 2015". It is also a signatory to the 1992 UN Framework Convention on Climate Change and the Kyoto Protocol.

The Solomon Islands also has strong regional commitments to sustainability and improved governance made under the 2005 *Pacific Plan*, the *Pacific Islands Framework for Action on Climate Change 2006-2015* and the *Pacific Regional Action Plan for Sustainable Water Management, 2003* (RAP) which was endorsed by all Pacific Island Nations Heads of State during the Pacific Island Leaders meeting in Auckland in 2003, and presented at the 3rd World Water Forum in Kyoto, Japan.

The **Pacific Plan** identifies regional priorities under the four key goals: economic growth; sustainable development; good governance; and security. Under these key goals there are objectives of direct relevance to water and sanitation: improved efficiency and effectiveness of infrastructure development and associated service and delivery; increased private sector participation in, and contribution to, development; development and implementation of: National Sustainable Development Strategies ... in line with the Millennium Development Goals; the Pacific Regional Action Plan on Sustainable Water Management; (RAP) policies and plans for waste management; international financing for sustainable development, biodiversity and environmental protection and climate change in the Pacific; and adaptation and mitigation efforts linked to the Pacific Climate Change Framework 2006-2015...; including public awareness, capacity building and improving governance, risk and vulnerability assessments; enhance governance mechanisms, including in resource management; upgrade and extend country and regional statistical information systems and databases across all sectors; develop a strategy to support participatory democracy and consultative decision-making; and under security the development and implementation of: policies and plans for the mitigation and management of natural disasters; and plans for urbanisation. Under the Pacific Plan, climate change is viewed as a subset of the broader and more immediate goal of sustainable development.

The **RAP** was developed after wide-ranging, multi-stakeholder, national consultations held throughout the region. The RAP outlined the needs of the water and sanitation sector to cope with current and future pressures on often limited water resources caused by increasing populations, development, non-climate hazards, as well as climate variability and climate change. Actions identified in the RAP focussed on using integrated water resource management to:

- improve the knowledge base;
- identify appropriate water extraction and treatment technologies;
- increase capacity;
- introduce risk assessment and management;
- engage communities in co-management at all levels;
- disseminate information;
- improve water governance;
- promote regional cooperation;
- reduce water demand, wastage and unaccounted losses;
- protect water sources; and
- ensure water supply and sanitation systems are sustainable.

These actions remain as relevant today in Solomon Islands as they were in 2003.



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Solomon Islands

National Water and Sanitation Sectoral Plan

Part III

Principles & Processes used to Develop the Plan

7 Principles Underpinning this Plan

This plan is based on the principles of: good governance; integrated water resource management; water use efficiency; and of mainstreaming adaptation into all aspects of policy and planning, especially those that concern natural resources and human survival.

7.1 Good governance: successful public policy and plan implementation

Analyses of successful policies and implementation mechanisms such as sectoral plans, that have been widely accepted by the public and have proven effective and efficient, show that they have a number of common principles. These are:

- 1. Government whole-heartedly committed to the policy and implementation mechanisms;
- 2. Policy and implementation mechanisms are consistent with Govt initiatives
- 3. policy and associated implementation mechanisms are based on sound theory and good information;
- 4. Policy and implementation mechanisms have clear policy goals and objectives;
- 5. There is a clear understanding of who is responsible for implementing the policy or plan;
- 6. Those responsible for implementing the policy have clear directions, appropriate managerial and political skills, and adequate information and resources;
- 7. Policy and its implementation mechanisms are actively supported by the community;
- 8. The goals and objectives of the policy and its implementation mechanisms are not undermined by other laws, policies, and implementation mechanisms, and
- 9. An appropriate management structure exists that facilitates collaboration, negotiations, and agreements, sharing of information and the monitoring, review and revision of the implementation process.

These constitute some of the key elements that must be in place if this national sectoral plan for water and sanitation is to be successfully implemented. Cabinet has specifically addressed point 9 above by approving the terms of reference (ToR) for the whole-of-government and community National Intersectoral Water and Sanitation Coordination Committee drawn from all Departments with responsibility for water, community-based-organisations (CBOs) and state-owned enterprises (SoEs), to oversee development and implementation of this plan and report to government on progress in its implementation.

7.2 Integrated water resource management

Integrated water resource management (IWRM) and planning is a partnership approach between government agencies, state-owned-enterprises, corporations with responsibilities for water and the communities who rely on water. It is based on recognition of the interconnectedness of the hydrogeologic, geographic, health, economic, social, cultural, governance, legal and political aspects of water and the importance of an integrated, collaborative approach to achieving sustainable, equitable and fair outcomes.

The five basic principles of IWRM are based on the Dublin Principles presented at the World Summit on Sustainability in Rio de Janeiro in 1992:

- **Principle 1:** Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- **Principle 2:** Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
- **Principle 3:** Women play a central part in providing, managing and safeguarding water.
- **Principle 4:** Water is a public good with social and economic value in all competing uses.
- **Principle 5:** IWRM is based on equitable and efficient management and sustainable use of water.

To make IWRM more relevant to Pacific island countries, the concept of an "*IWRM Island Style*" has been introduced with the following principles.

- 1. Island countries should manage water resources to take account of impacts on receiving coastal waters;
- 2. Drought and disaster preparedness planning should be addressed;
- 3. The small size of island countries requires a national approach to capacity building, awareness and governance;
- 4. The limited human and financial resource bases in most island countries need regional and international support and collaboration;
- 5. Rainwater harvesting should be incorporated in water management plans to augment water supply.

These principles incorporate the concepts of managing water from ridge to reef by people from Cabinet to the remotest rural community. They embody the idea that IWRM is water management for multiple purposes and multiple objectives using multiple means. The vision statement for this plan was developed using these concepts.

7.3 Water use efficiency

The total amount of water on the earth is fixed. Its allocation in space and time is governed by the natural hydrological cycle and by the ways humans have modified that cycle to lessen the impacts of variability. The number of people on earth is increasing along with demand, so the quantity of water per person is declining. In order to sustain human needs for water and for food production it is therefore necessary to increase the efficiency with which water is delivered and used. This means reducing as far as possible water losses in transmission, reducing wastage in use and in increasing the efficiency with which water is put to its various uses. While the Solomon Islands is blessed with high average rainfall, there are times and locations, particularly in low coral atolls, where water is scarce. The principles that water is a finite resource and that therefore it must be conserved and used wisely underpins water use efficiency and this water and sanitation plan.

7.4 Mainstreaming adaptation

In the face of the uncertainties surrounding the magnitude and timing of climate change, its impacts and lack of detail of impacts on ecosystem functions in Pacific Island Countries (PICs), it has been argued that the only rational adaptation strategy is: *"to develop the general capacity of a society to cope with change by building up its institutional structures and human resources while maintaining and enhancing the integrity of ecosystems"*. In this view, any activity towards ecologically sustainable human development constitutes adaptation.

Despite limited financial, technological and infrastructure resources in many PICs, their communities' well-developed local institutions, resilient social systems, sensitivity to environmental change and their high degree of equity, together with their kinship-based, transnational networks are the basis for considerable capacity to adapt to climate change. The process undertaken to develop this plan has strengthened institutional structures and human capacity and is itself contributing to adaptation.

There is a direct linkage between IWRM and climate change adaptation which has a number of key messages:

- 1. If our global energy habits are the focus for mitigation, the way we use and manage our water must become the focus for adaptation;
- 2. Changes in climate will be amplified in the water environment;
- 3. Improving the way we use and manage our water today will make it easier to address the challenges of tomorrow;
- 4. The best approach to manage the impact of climate change on water is that guided by the philosophy and methodology of IWRM;
- 5. There are no simple technical fixes;
- 6. In addressing water shortages, as much attention should be given to managing demand as to increasing supply, by introducing more efficient technologies as well as

7. The challenge of "climate-proofing" the future requires that adequate funds are allocated today for water resource management.

7.5 Principles as a framework for developing this plan

The process used to develop this plan has used the above principles, previous Government initiatives and the policies and objectives of the NDS and draft NIIP as a guiding framework. The plan has been developed using a participatory process with all relevant government agency stakeholders and representative community-based organisations, and state-owned enterprises through the NIWCC. Throughout the process, the dependence of island health and social, cultural and economic life on good quality freshwater as well as the social, cultural and economic value of water were emphasised in the discussions. The impact of land development and catchment management on water yield and particularly water quality were also identified as key issues as was the fundamental importance of land ownership in the Solomon Islands.

8 Participatory Process Used to Develop this Plan

This Plan was developed by the NIWCC. The organisational structure of the NIWCC is shown in Figure 3.



Figure 3 Organisational structure of the NIWCC showing its overall composition and its reporting and communication pathways

The plan development process has involved individual consultations with key stakeholders as well as facilitated workshops with the NIWCC. The theme and vision statement were developed during the first NIWCC Workshop and the principles of good governance and IWRM were discussed as well. Subsequent NIWCC Workshops identified the priority issues to be addressed, the potential strategies to tackle the issues and the broader goals and more specific objectives of the plan. Selected activities with identified lead agencies and time lines were developed to achieve plan objectives.

The first step in the development of this IWRM plan was to review previous Government policies, statements, and draft documents and key reports dealing with water and sanitation and related issues (Table 3). The water and sanitation, sewerage and wastes. environment and climate change sectors of the NDS and the analyses of the draft NIIP were used as a basis for plan development. A five phase adaptive planning process (An iterative, integrative approach was used to develop this plan. Key central elements in the process are the inputs from the whole-of-government and community–based-organisations, NIWCC and the oversight of the process by the lead Ministry, the Ministry of Mines, Energy and Rural Electrification (MMERE). The Policy and Plan were workshopped through a series of meetings with NIWCC which continually refined the draft Plan.

Table 4) was carried out through the workshops with NIWCC. These stages identified the key issues, defined the policy goals and objectives, refined the policy and developed its

implementation plan.

An iterative, integrative approach was used to develop this plan. Key central elements in the process are the inputs from the whole-of-government and community-based-organisations, NIWCC and the oversight of the process by the lead Ministry, the Ministry of Mines, Energy and Rural Electrification (MMERE). The Policy and Plan were workshopped through a series of meetings with NIWCC which continually refined the draft Plan.

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Phase	Objective	Components	Principal Outputs
I. Formulation of the Issues	Determine issues, problems and opportunities	Previous actions and policies, recognised issues, problems, opportunities, and their interactions; constraints to effective management	Issues to be addressed by policy, plans, legislation
II. Ends Planning	Determine where you want to be and the gaps between that and now	Extract vision, principles, goals, and objectives to achieve the desired ends.	Policy principles, Policy goals and objectives
III. Means Planning	Choosing mechanisms to achieve goals and objectives	Develop and select actions for achieving goals and objectives and indicators for completion of actions	Implementation Plan Actions
IV. Resource Planning	Determine resources required for planned actions	Define resource needs and identify if resources are available or how they will be generated or acquired	Implementation Plan resources needs
V. Implementation and Control	Determine responsibilities and schedules for implementation	Identify who is responsible for actions, when they are to be implemented and how implementation is to be monitored	Implementation Plan Schedule and Responsibilities for implementation. Ministerial Operations Plans

Table 4 Five phase adaptive planning process used by NIWCC to develop this Plan



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Solomon Islands

National Water and Sanitation Plan

Part IV

Issues Addressed in this Plan

9 Identifying Priority Issues

The Solomon Islands is blessed with generally good and relatively reliable rainfall. As the NDS and draft NIIP acknowledge, however, the water and sanitation sector are vulnerable to both natural and human-related factors. Government intervention can reduce sector risks provided the priority issues requiring intervention are clearly identified.

9.1 Vulnerability of water security in Pacific Island countries

A recent report¹ has examined the climate and non-climate risks to water supply security in 14 Pacific Island counties (PICs), including Solomon Islands and East Timor to the year 2030. Despite the very great diversity between PICs, some high risks were common to most countries. The most serious of these are listed in Table 5.

Table 5 Risks to water supply security in Pacific Island Countries and East Timor to 2030¹.

No.	Risk
1	Increasing water demands due to population growth and development. In some urban areas these projected increases lie between 70% and 240% by 2030.
2	Leakage of good quality water from many urban pipe distribution systems. In many situations unaccounted-for water is 50% or higher.
3	Pollution of water resources due to population growth, poor sanitation systems, catchment development and increasing urbanization. These have consequent major public health impacts
4	Salinsation of fresh groundwater in coastal areas and atolls due to seawater intrusion caused by unregulated, over-pumping of groundwater.
5	Property rights disputes between traditional land owners and governments over use, protection and management of water sources. This has resulted in abandonment of good water and hydropower sources or in non-sustainable compensation payments.
6	Poor water governance and management at national, island or province and local levels. This is particularly evident during droughts and floods.
7	Lack of capacity and resources to deal with current issues. This is particularly so in countries with widely dispersed rural communities or isolated islands.
8	Lack of engagement of local communities. Under-resourced central government agencies cannot manage water and sanitation in remote communities. Building local resilience is central
9	Impact of mining on surface and groundwater sources.
10	Lack of information on the availability of water, its quality and its use. It is hard to manage what we do not know.

The report concluded that the non-climate factors of increasing water demand due to expanding populations, water source pollution and leakage from pipe systems pose much greatest risks to water security out to year 2030 than climate change related factors. The many reports available on Solomon Islands (Table 3) indicate that the issues in Table 5 are also significant challenges in Solomon Islands.

Water and sanitation challenges in PICs are widely diverse, and in some instances unique to the country, the island or even the particular location on the island. There are, however, some common strategic areas across the Pacific to address the risks to water security outlined in Table 5 and also the additional challenges posed by climate change. These are:

¹ Falkland, A. Report on Water Security and Vulnerability to Climate Change and Other Impacts in Pacific Island Countries and East Timor. For Pacific Adaptation Strategy Assistance Program, Department of Climate Change and Energy Efficiency, GHD Pty Ltd, August 2011

- water supply and sanitation systems
- Demand management and loss control
- Drought and flood planning
- Capacity building and training
- Community education, awareness and participation
- Other water supply and sanitation strategies for specific circumstances.

These strategies are consistent with the goals and objectives of the NDS and draft NIIP and provide the framework for identifying issues to be addressed in this plan.

9.2 Categorising the issues in Solomon Islands

A large number of past reports, strategies and analyses have identified and repeated the complex, priority water resource and sanitation issues in both rural and urban areas in Solomon Islands. These are also highlighted in the NDS and the draft NIIP. Most require government policy and planning intervention. These issues have been reviewed and refined by the NIWCC. To handle the complexity of issues, NIWCC have provisionally grouped them into nine general categories. The categories are:

1. Governance

- 2. Information
- 3. Capacity and Resources
- 4. Community Engagement and Participation
- 5. Safe, Secure, Reliable and Protected Water Sources
- 6. Reliable, Safe & Sustainable Water Supply
- 7. Wise Use and Conservation
- 8. Sanitation and Waste Management
- 9. Climate extremes, Disasters and Climate Change

These categories are aligned with the principles of good governance, integrated water resource management, water use efficiency and adaptation to climate change.

Under each of these categories the NIWCC provisionally identified a number of priority issues.

1. Governance

The state of water governance in Solomon Islands suggests the provision of safe freshwater is a low priority for the Government. There is no Government-endorsed national policy for water and sanitation. This means there is no clear statement of Government priorities and no mechanism to allocate resources to priority issues. National legislation and laws related to water and sanitation are out-of-date and not enforced, and there is no national water and sanitation sector plan. As a consequence, Provinces also have no water and sanitation policies and strategic plans. There is no regulation or licensing of water extraction.

There are essentially five agencies responsible for water supply and sanitation in the Solomon Islands:

- Water Resources Division (WRD), Ministry of Mines, Energy and Rural Electrificationnational water resource assessment for water supply and hydro-power generation, management and development of groundwater
- Environmental Health Division (EHD) and Rural Water Supply and Sanitation (RWSS) of the Ministry of Health and Medical Services, for provision of safe water and sanitation to rural populations in Solomon Islands
- Solomon Water (SW, formerly Solomon Islands Water Authority, SIWA) –provision of safe water and some wastewater services to urban populations in the capital and regional centres
- Provincial Governments provision of water services to provincial urban centres not

serviced by SW in the capital and regional centres

• Village Committees - operation and maintenance of water supply systems

As there are overlaps in responsibilities, the roles and responsibilities of agencies in the sector need to be clarified and updated. Importantly, coordination between government departments, agencies state-owned enterprises (SOEs) and community-based organisations (CBOs) is limited and there is no systematic reporting to government. Water sources have no effective legal protection and the financial sustainability of urban water and sanitation services is precarious.

There is a significant lack of managerial and organisational skills to effectively develop work plans and utilise available skills within government agencies, state-owned enterprises (SOEs) and community-based organisations (CBOs). In addition there is an increasing number of international priorities such as biodiversity, WatSan, gender equity, sustainable land management, disaster risk reduction and climate change being implemented through a wide range of development and aid organisations operating through different government agencies, SOEs and CBOs, that are required to be mainstreamed. There is a significant risk that government resources are being overloaded. These programs may actually weaken overall institutional capacity, and divert effort from urgent issues, such as the high rates of infant deaths due to water-born diseases.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

- 1.1 No approved national policy or Provincial policies for the water and sanitation sector
- 1.2 No strategic national, provincial and village water, sanitation and waste sector plans
- 1.3 No water and sanitation Master plans for urban areas
- 1.4 Water legislation is outdated and not enforced
- 1.5 No drought and flood contingency plans or strategies ??
- 1.6. Roles and responsibilities for water and sanitation management need to be clarified
- 1.7. Limited coordination and cooperation between departments and agencies
- 1.8 Inadequate protection of water sources
- 1.9 No regulation of water extraction, licensing of extractors
- 1.10 No independent regulation of water prices and sanitation charges
- 1.11 Financial sustainability of urban water and sanitation is precarious
- 1.12 No systematic reporting to government on the use and condition of the nation's water resources and sanitation services
- 1.13 Despite the high national priority of water and sanitation, no Ministry has water in its title
- 1.14 No endorsed water safety plans ??

2. Information

Information on the sustainable yields of water from streams and groundwater aquifers and on the quality of the water, and its use by different sectors and in different locations is essential for the effective, efficient and equitable management of water. This information is only partially known for a few systems in the Solomon Islands. Indeed even the rainfall distribution and its variability across Solomon Islands, especially at higher elevations are incomplete.

While some information on household water use in Honiara is available, the water demand required by industry, commerce and institutional use is less well documented and the information in both rural areas and Provincial centres is even more sparse. Planning for future water supplies and sanitation services requires such information. In addition, there is little data on the impact of catchment land uses, as well as sewerage and waste disposal on the near-shore environment. There is no national data base for the storage and retrieval of information on water and sanitation.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

- 2.1 Incomplete data on the distribution and variability of rainfall across the Solomon Islands
- 2.2 Limited information on the safe yield of surface and groundwater sources, their variability and their water quality
- 2.3 Limited routine monitoring of water resources
- 2.4 No national data base on water sources, water availability, sustainable yields, water quality, water use sanitation services and the impacts of waste disposal on the near-shore environments
- 2.5 Limited information on water demand, particularly by economic sector and in provinces and data on unaccounted for losses is incomplete
- 2.6 Limited information linking public health to the condition of water sources, land uses and sanitation systems
- 2.7 No publically available seasonal rainfall forecasts ??
- 2.8 No system for reporting regularly to Government on the state of the nation's water resources and sanitation services or their use.

3. Capacity and Resources

The number of trained people to plan and manage water resources and sanitation, and to ensure adequate supplies of good quality water and appropriate sanitation services at the national provincial and rural levels in Solomon Islands is very limited. The human and financial resources available for water management are limited especially in the Provinces and villages. Monitoring is not systematic and regular. There are very limited training opportunities for increasing capacity in the sector for government or SOE staff, industry or at the village level and there is a dearth of qualified engineers and plumbers. Aid and donor programs tend to focus on infrastructure.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

- 3.1 Very limited number of local, trained and skilled people for water and sanitation planning, operation and management at the national, provincial, urban or village levels
- 3.2 Limited resources for planning, maintenance, refurbishment and upgrading of infrastructure
- 3.3 Very limited resources for testing, monitoring, assessment, evaluation and reporting
- 3.4 Dearth of trained local water engineers, technicians and plumbers
- 3.5 Limited training for villages in the operation, maintenance and repair of water supply and sanitation systems
- 3.6 Limited training programmes and opportunities in the water and sanitation sector
- 3.7 Poor succession planning

4. Community Engagement and Participation

Given the dispersed nature of rural communities across Solomon Islands it is not possible for agencies predominantly located in Honiara to manage water resources, water quality and their use across the entire country. Local communities need to be engaged in the planning, management and maintenance of their water supply and sanitation systems. There is limited community awareness, even in urban areas, about water resource vulnerability, protection and conservation and limited community participation in the planning, protection and conservation of water sources and in the installation and maintenance of rainwater harvesting and improved sanitation systems.

Raising awareness at all levels and particularly engaging school children in the water and sanitation sector is a key strategy and there is a need for improved school curricula at all levels on water, sanitation and hygiene issues. There are no incentives for encouraging improvement of household rainwater harvesting and sanitation systems and limited information on maintaining and repairing them.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

- 4.1 Limited awareness about water resource vulnerability, protection and conservation at the local level
- 4.2 Limited community participation in the planning, protection and conservation of water resources and in promoting improved sanitation systems.
- 4.3 Poor maintenance of household water and sanitation infrastructure.
- 4.4 No incentive schemes for encouraging the installation and improvement of community or household rainwater harvesting and sanitation systems.
- 4.5 Limited training programme for the installation, management and maintenance of community or household rainwater harvesting, water supply and sanitation systems
- 4.6 Need for improved school education programs at all levels on water, sanitation and hygiene.

5. Safe, Secure, Reliable and Protected Water Sources

One of the most important strategies for providing water for human use is to protect water sources from contamination, misuse and misappropriation. In Solomon Islands this task is complicated by traditional land ownership.

Land ownership

Land is the centre of life and is most valued heritage of the whole community. Land has spiritual, historical and political significance. It provides links with ancestors and spirits and is a source of political and economic power. Absolute ownership of land resides with the village or clan and cannot be bought or sold. Instead payment or compensation is made for the temporary use of the land. The traditional right is than any resources contained within or bounded by the land, such as water, belongs to the landowner. This is fundamentally different to the situation in developed world countries and is problematic for securing and protecting reliable, safe water sources for downstream communities, either for water supply or hydropower generation.

Disputes between government agencies and traditional land owners over compensation for use of water sources have resulted in the abandonment of higher elevation water sources for both public water supply and hydro-power generation. This has caused increased pumping costs for water supply from groundwater and continued reliance on expensive fossil fuelburning conventional power generation.

Impact of land use and environmental factors on water quality

Traditional farming practices and more recently logging in water supply catchments continue to pollute water sources with excess sediment and nutrients. This is not only a serious problem for the quality of water supplies and subsequent public health impacts, it sometimes forces woman and children to walk long distances for better quality water. Sediment and nutrient laden river discharge also severely damage reefs, near shore ecology and local fisheries.

In the atolls and low-lying islands, groundwater and rainwater are the main sources of water. In these islands, the shallow groundwater exists as a thin freshwater lens, underlain by seawater. Inappropriate land use can rapidly pollute the shallow groundwater. In addition, inappropriate groundwater extraction techniques and pumping rates can lead to seawater intrusion and salinisation of the groundwater. These freshwater lenses are vulnerable to droughts and to island overtopping during storm surges, cyclones and tsumanis.

Ineffectiveness of currents laws

These problems continue despite the fact that the River Waters Act 1968 and the Solomon Islands Water Authority Act 1992 have provision of declaration for water conservation areas in certain locations. The Environmental Health Act 1998 and the Environment Act 1998 have provisions provide for controlling pollution by any development or waste disposal throughout the country. The fact that these problems persists indicates the difficultly of enforcing laws and regulations in a widely dispersed, mostly rural country with limited numbers of national government staff. This suggests that a programme focussed on education and awareness and encouraging behavioural change at the community level coupled with an innovative incentive scheme such as payment for ecological services may be a way forward.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

- 5.1 Lack of protection of surface and groundwater sources
- 5.2 Uncontrolled land uses, particularly logging and farming, in water supply catchments and groundwater production areas
- 5.3 Impacts of land use on water quality and water availability for water supplies
- 5.4 Impact of land use on near-shore environments and ecosystems
- 5.5 Ineffectiveness of current laws and regulations
- 5.6 Abandonment of good water sources for water supply and power generation due to land ownership disputes and compensation claims
- 5.7 Lack of national incentive schemes for traditional landowners in water source areas
- 5.8 Lack of standard, equitable national scheme for eco-compensation
- 5.9 Lack of awareness of health, economic and ecological impacts of inappropriate land use in water supply catchments and groundwater source areas
- 5.10 Lack of regulations and other schemes for controlling the rate of groundwater extraction to sustainable rates.

6. Reliable, Safe & Sustainable Water Supply

This is a key issue and one of very broad, general concern throughout both rural and urban areas in Solomon Islands.

Not meeting Millennium Development Goals

Solomon Islands will not meet its obligations under the Millennium Development Goals (MDGs) for potable water supplies. About 35% of total households obtain fresh water from community stand pipes, while about 25% source water from streams with 23% getting water from either household or community rain tanks. In rural areas, which have about 87% of the total population, only 25% have access to piped water while in the capital, Honiara, about 61% of households access piped water.

Rural areas

The rural population is 87% of the total population in Solomon Islands In rural areas there is a continuing need to greatly improve water supply systems. Where improved systems have been installed, resources and training for maintenance and operations are lacking and systems fall into disrepair. Uncertainties over responsibility for the systems between village, Province and National Governments add to the problems.

While Solomon Water's (SW's) mandate is to provide water services to all urban centres throughout the country, it currently only supplies Noro, Auki, and Tulagi. In the first two provincial centres, about 60% of households are services while in Tulagi about 90% of the population is serviced. Water losses in Noro and Auki are greater than 50%, similar to or exceeding those in Honiara while in Tulagi they are thought to be as high as 77%. Water supplies in these rural centres are also intermittent. The reliability of services needs to be improved to make payment for water more attractive and the losses need to be reduced to improve efficiency and reduce costs. In order to be in a position to supply these as well as other provincial centres sustainably, SW needs to be in a stronger financial position.

In urban centres, where 13% of the population live, there are frequent water cuts. Water infrastructure is rundown and needs substantial investment for urgent upgrade, rehabilitation and maintenance of tanks, boreholes, treatment plant, pipelines and household connections. Illegal connections also contribute to the problem of unreliable water supply and to losses.

Intermittent piped water supplies create water quality problems in delivery to households. Water quality problems in piped systems are exacerbated by land disturbance and land use in water source areas when water becomes turbid, as it does in wet seasons. Most households are distrustful of turbid tap-water and water quality which, together with intermittent availability, are major concerns. Despite these concerns there are no nationally accepted water quality standards or guidelines.

High cost of pumping and losses

Despite having potentially good upland sources of water, only 20% of Honiara's piped water is supplied via gravity systems. The remaining 80% has to be pumped at high cost and large greenhouse gas emissions. While there is the possibility of reducing pumping costs by using upland water sources conjunctively for both water supply and hydro-power generation, negotiations with traditional land owners cause lengthy delays.

Water produced per day from surface and groundwater sources is around 27,000 m³/day with losses estimated to be around 54%, most of the water produced does not generate any revenue. Total demand in the capital is estimated to be around 23,000 m³/day. With the losses from the system this means that only 63% of demand is able to be met from the piped water supply system. In addition, the high cost of pumping and treating water only to have it lost from the system is an additional financial burden on an already overburdened system.

The high production costs, water losses, unmetered and illegal connections, aging and inadequate infrastructure and the lack of an independent prices regulator, mean that the urban water supplier, SW, is in a financially precarious position although water prices are high relative to per capita gross domestic product (GDP).

Given the above, It is understandable why, in consultations during the development of the NDS, water supply and sanitation were high priority concerns in both rural and urban areas.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

- 6.1 Lack of safe, treated piped water for rural and urban areas and especially for rural schools, hospitals and clinics
- 6.2 Vulnerability of water supplies in low islands and atolls
- 6.3 Contamination of water sources by land uses in catchment and groundwater source areas, such as logging and farming
- 6.4 No water safety plans.
- 6.5 Absence of national water quality standards or guidelines
- 6.6 Operation, maintenance and replacement of aging infrastructure in rural and urban areas
- 6.7 Lack of training for provincial staff and villagers in operation and maintenance of water supply systems including rainwater harvesting
- 6.8 Unreliable and intermittent water supplies in urban areas
- 6.9 Limited assessment of the sustainable rate of groundwater extraction, especially in low islands and atolls
- 6.10 Inappropriate groundwater pumping methods in low islands and atolls
- 6.11 High cost of rainwater tanks
- 6.12 General absence of rainwater tanks in urban water planning
- 6.13 High pumping costs and the use of non-renewable energy for pumping

- 6.14 Cost recovery for the operation, maintenance and replacement of water supply infrastructure
- 6.15 Precarious financial sustainability of Solomon Water
- 6.16 Lack of town planning in urban areas and impact on provision of water services
- 6.17 Lack of coordination in aid and donor water projects and lack of engagement with local communities in project planning
- 6.18 Absence of planning for conjunctive water supply and hydro-power generation in potential hydro-power projects

7. Wise Use and Conservation

In order to supply adequate water to communities it is essential that demand for water and water losses from reticulation systems be controlled to reasonable levels. While demand management can be done through metering and charging for consumption in urban areas it is more problematic in remote rural communities. There, conservation and wise use need to be accepted community values. In wet seasons in the Solomon Islands there is frequently too much water, while in dry seasons, water is scarce. This poses difficulties in education and community awareness campaigns, but it is important that they focus on school children.

Part of the challenge in planning water supplies is to have, accurate data on water demand or use by different economic sectors or use from different water sources. There is an imperfect, information base on water demand, particularly by economic sectors, by dispersed rural communities and across wet and dry seasons. Estimates suggest that average per capita daily domestic demand varies between about 60 L/pers/d to about 200 L/pers/d.

Tiered water pricing is a widely-used method for controlling profligate water use in urban water reticulation systems, and is used by SW for metered customers. This technique, however, relies on having water meters on individual connections and customers willing to pay. In Honiara it is estimated that there are around 12,200 households. Of these 37% are metered, 20% unmetered, 4% illegal connection, and 39% not served. With only 37% of households metered any tiered water pricing system is unfair to customers with meters. In addition, with non-revenue water of at least 50% in urban areas, it is difficult to preach water conservation to customers with such high system losses.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

- 7.1 The difficulty of convincing households of the importance of water conservation when there is too much water during the wet season and too little during the dry season
- 7.2 Limited community programs on water conservation
- 7.3 Controlling demand in non-metered rural and urban situations
- 7.4 Unacceptably large water losses and non-revenue water from piped water supply systems.
- 7.5 Large percentage of unmetered and illegal household connections in urban areas
- 7.6 Cost of urban household water relative to per capita GDP
- 7.7 Absence of an independent prices regulator for water and sanitation charges
- 7.8 No national targets for water conservation
- 7.9 Limited data on water use by economic sectors across regions and over wet and dry seasons

8. Sanitation and Waste Management

Not meeting UN Summit Sustainable Development targets

If water appears not to be a priority for the government then sanitation is of even lower importance. There are currently no national programs to address urban sanitation issues and limited financial and human capacity of the Rural Water Supply and Sanitation (RWSS) to respond to the requests for assistance in the installation of sanitation systems in the rural communities. The focus of the RWSS has traditionally been the provision of water supplies

rather than sanitation although that is changing.

The Solomon Islands will not meet the target set out in the World Summit on Sustainable Development in Johannesburg in 2002 of "halving the proportion of people who do not have access to basic sanitation by 2015". Over 80% of rural households and rural schools have no sanitation systems. Urban sanitation is also a major concern. Only the small central area of Honiara has a reticulated sewerage system connected to about 11% of households. This system discharges untreated sewerage from about 13 poorly maintained outfalls across reefs, with significant environmental impacts. Both cost recovery and financial resources for sewerage system improvements are inadequate. In the remainder of the urban area, sanitation treatment is through generally poorly constructed septic tanks which contaminate the soil and groundwater. Problems are compounded by the lack of resources to monitor and enforce construction, operating and maintenance standards.

Septic tanks

Septic tanks are a particular problem in the wet season due to rising contaminated groundwater. Irregular desludging of septic tanks is also problematic, as is the disposal of septic tank sludge. In the peri-urban fringe areas, particularly the areas of informal and makeshift housing, very poor sanitation contaminates surface and groundwater sources. As a consequence there is a high incidence of diarrhoea and water-borne diseases throughout Solomon Islands and unacceptably high rates of related infant mortalities.

Waste disposal

Wastes and pollution from solid, hazardous and toxic wastes are a major threat to receiving waters. There is limited capacity for and awareness of waste management. And there are limited and poorly constructed waste disposal sites.

The growing sources and extent of waste and pollution from waste sites are major threats. Census data from 2009 suggest that 57% of household rubbish is dumped, burnt or buried in the backyard of residential houses, while 18% is dumped directly into the ocean. In provincial urban centres rubbish collection by the government is less than 3% and service is often poor due to lack of necessary resources. There are no service providers for the collection of waste in rural areas.

Collection of waste by private contractors for Honiara City Council covers only 36% of the Honiara population. A significant number of people collect and dump their own rubbish at the Ranadi dump because of unreliable and inconsistent collection of rubbish by contracted service providers.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

incidence of diarrhoea and water-borne diseases

- 8.2 High percentage of rural households without adequate sanitation
- 8.3 Limited, aging piped sewerage systems in urban centres.
- 8.4 Large number of poorly designed and constructed septic tank systems in urban areas
- 8.5 Inadequate desludging of septic tanks
- 8.6 Inadequate facilities for septic sludge disposal
- 8.6 Pollution from sewage outfalls and septic sludge disposal
- 8.6 Poorly maintained sewerage outfalls
- 8.7 Impact of waste disposal on near-shore environments and ecosystems
- 8.8 Lack of enforcement of building regulations and operation and maintenance codes for septic tank installation and maintenance
- 8.9 Groundwater and surface water pollution from septic tanks especially in wet seasons
- 8.10 Inadequate sanitation in peri-urban areas
- 8.11 Inadequate solid waste collection and disposal sites

8.12 Financial unsustainability of urban sanitation systems.

9. Climate Extremes, Disasters and Climate Change

Like other PICs, climate is in the Solomon Islands is coupled to large-scale swings in sea surface temperature in the surrounding seas. The country oscillates between having too much water during heavy rainfalls to having significant deficits during ENSO-related droughts. Frequent flooding, such as the major flooding which completely inundated the Guadalcanal Plains in 1986 as a result of tropical cyclone Namu, and landslides are major issues, especially in urban areas. Besides direct deaths, these also cause additional health problems due to the large number of septic tanks. With catchment land use changes, floods lead to major sediment deposition and debris deposited on coast reefs.

In addition to climate variability, Solomon Islands is also subject to a high frequency of natural disasters such as major cyclones, landslides, storm surges and island overtopping, earthquakes and subsequent tsunami, such as those in 2007 and 2013, volcanic eruptions, all of which disrupt water supplies. Between 1980 and 2009, the Solomon Islands experienced 17 major disaster events, costing over US\$20 million and affecting almost 300,000 people. Of these two were earthquakes and four tropical were cyclones directly impacting over 100,000 people with over 100 deaths.

The National Disaster Management Office (NDMO) has developed a Disaster Management Policy which focuses on disaster preparedness and management to ensure adequate disaster awareness and institutional capacity to address disasters. The National Disaster Council coordinates activities from the Central Government with Provincial Disaster Management Teams. Limited information, however, exists related to hazard and disaster risk priorities. Much of the information that exists is mostly country level assessments, which is too coarse amd do not highlight specific needs and challenges. More detailed assessments have been done for Honiara and Malaita but are scarce for the rest of the country.

The principle threats identified in climate change predictions for the Solomon Islands are sea level rises around 3.5 mm/year, which is a particular threat for low lying islands and atolls, increased temperatures of between 0.4 and 1.0° C by 2030, and perhaps increased annual rainfalls, rainfall intensity and increased rainfall variability. While sea level rise may not be a significant threat in the short term, of say 10 years, increased temperatures, rainfall and rainfall variability do pose particular challenges to water supply and public health over the long term. Management of the impacts to improve adaptation requires routine climate monitoring as well as improved seasonal forecasting.

Solomon Islands have the opportunity to mitigate greenhouse gas emissions through its potential to use renewable energy rather than fossil fuel. With good, relatively reliable rainfalls, steady winds at higher elevations and sunshine there is significant potential to reduce reliance on fossil fuel power generation, especially in pumping water. A major impediment in realising this potential is gaining the approval of land owners to access land and water. This impediment has caused the suspension or abandonment of planned hydo-power plants.

Issues

NIWCC provisionally identified the following specific issues to be addressed:

- 9.1 Lack of seasonal forecasting of climate and implications for water availability
- 9.2 Lack of drought contingency plans
- 9.3 Poor drainage in urban areas
- 9.4 Limited resources for disaster preparadness ???
- 9.5 The need for detailed natural hazard and risk assessments in regional urban centres
- 9.6 The long time frame for climate change impacts
- 9.7 Total reliance on fossil fuel for electricity generation, especially for pumping water
- 9.8 Failure to capitalise on hydro-power opportunities

In the next section objectives, indicators and activities to address the above issues are detailed together with agencies responsible for implementation.



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Solomon Islands

National Water and Sanitation Plan

Part V

Objectives, Indicators, Activities and Responsibilities



Solomon Islands

National Water and Sanitation Plan

Part VI

Implementation Schedule and Monitoring