

SOPAC Internship

# Solomon Island Water Sanitation and Climate Outlook

April 2011

Mike Low

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# *Solomon Island Water, Sanitation and Climate Outlook*

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## **Acknowledgements**

I would like to express my appreciation and thanks to the government and people of the Solomon Islands for the support received in carrying out this assignment. Particular thanks to all participants in workshops and consultations, your contributions and comments are greatly appreciated and without your input the outlook would not have been possible. Special mention goes to the team at the Water Resources Division (WRD) of the Ministry of Mines Energy and Rural Electrification who supported me throughout this assignment as the host organisation. Special mention goes to Isaac Lekelalu (Deputy Director), Charlie Bepapa (Director), Richard Molea and Michael Maehaka for their guidance and support not only with the assignment but the daily logistics of living and working in the Solomon islands. The opportunity to work on this challenging and enlightening assignment would not have been possible without the efforts of Marc Wilson and the team at the Pacific Islands Applied Geoscience Commission (SOPAC) and the great work that they are doing in Pacific Island Countries promoting Integrated Water Resource Management and addressing water and sanitation issues. Thanks also to the staff at the International Water Centre for coordinating with SOPAC to make this opportunity happen, with particular thanks to Peter Wegner for his guidance in the development of this report. Finally acknowledgement of moral support from my fellow students, Kelly, Piotr and Vanessa who all shared in the adventure and experience of internships with SOPAC as we spread out across the pacific.

Once again thank you to all that took the time to sit and discuss issues facing the Solomon Islands weather as part of the formal workshop and consultation process or just a social catch-up.

Best Regards

Mike Low

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## Executive Summary

The Solomon Island Water Sanitation and Climate Outlook identifies issues that matter most to the Solomon Islands, prioritising the existing issues and emerging threats most critical to the nation's water resources and sanitation services over the next 20 years. The report was developed in conjunction with the National Intersectoral Water Coordination committee (NIWCC) via its multi-stakeholder platform providing a broad range of perspectives and priorities from an identified cross section of governmental and civil agencies. It was identified early on that knowledge of Integrated Water Resources Management (IWRM) principles and practices was very limited within the NIWCC for participation in the development of inputs for this report with a focus of the project to develop awareness and capacity within the NIWCC and broader stakeholder groups.

The Solomon Islands are an archipelago made up of around 992 islands with a total land area of around 28,896 km<sup>2</sup> and encompass more than 800,000 km<sup>2</sup> of sea area spread over more than 1500 km from the Bougainville Islands of Papua New Guinea in the Northwest and Vanuatu in the Southeast.

Although population estimates vary, the 2009 Census showed the population of the Solomon Islands to be 515,870 with 80.3% of the population in rural communities across around 350 islands that are inhabited including the 6 main islands. The ethnicity of the population is predominantly Melanesian (about 95%), but there are also smaller Polynesian, Micronesian, Chinese and European and other communities. The social structure is complex with in excess of 84 different dialects spoken with the most common being Pidgin English. Customary practices vary across the country with different practices for land tenure, leadership, and codes of behaviour.

Projections from the census data indicate that population growth will result in a doubling of the current populations for: Solomon Islands, 2039; Total Urban 2024; and Rural 2050 assuming growth trends continue.

The main islands are mostly of volcanic origin with rugged and mountainous land profiles with available surface and ground water. However, the archipelago also includes low lying Coral atolls only a few meters above sea level, with no surface water, and the populations totally dependent on rain water harvesting or shallow ground water lenses. The climate is typical of many tropical areas, characterised by high and rather uniform temperature, humidity and, in most areas, abundant rainfall in all months.

Forests are a valuable natural resource due to its extensive biodiversity and essential source of materials to sustain livelihoods. Factors contributing to the loss of natural resources include: logging; population increase; poverty and lack of cash; large-scale expansions of agricultural schemes including cocoa, coconut, teak and mahogany plantations; cattle ranches and irrigated rice cultivation; the limited political will among government decision makers to effect changes; inadequate coordination between government agencies; and minimal capacity of government agencies to monitor and enforce regulations.

Water and sanitation infrastructure both in urban and rural settlements is in a serious state of disrepair there are significant gaps in governance and institutional arrangements and shortfalls in both human and financial capacity for the provision of safe effective water and sanitation services to both urban and rural communities.

Through workshops the NIWCC identified a wide range of issues relating to water sanitation and climate. These were evaluated to identify six priority issues that are core to many other issues being faced in relation to water, sanitation and climate.

1. Governance: Institutional and governance frameworks out dated and inadequate for effective water resource management.
2. Capacity: Human and financial capacity of SIG and civil society inadequate to support effective responses too existing and emerging IWRM Issues.
3. Governance: Land and water ownership, rights and obligations unclear.
4. Environmental: Environmental degradation due to development activities.
5. Security of Supply: Environmental contamination of water sources due to inadequate waste management.
6. Climate: Sea level rise and impacts on livelihoods

People are central to addressing the issues identified with the need for skills not only related to the technical capacity of sectoral organisations but the administrative and operational capacities. There has been limited progress in the mainstreaming of IWRM, engagement of the NIWCC and the implementation of water resource legislation and policy. All these Programs need to be fast tracked but this is unlikely to happen without programs to strengthen the institutional capacities of the relevant sectors.

While interventions are underway for the training and development of organisational staff in the water resource management sector there is a need to provide on the ground mentoring through an ongoing program for the development of individual skills and organisational management to not only address project and program initiatives but to focus on the day to day operational issues faced by the organisations.

The recommendations listed in response to the identified issues reflect those made by past programs but have an emphasis on the need to provide technical assistance to build in country capabilities in order to make progress on outstanding recommendations.

- R1 Formation and Endorsement of a Water Resources Apex Body
- R2 Review and Clarification of the Terms of Reference for the Water Resources and Sanitation management authorities
- R3 Development and endorsement of overarching Water Resources Policy
- R4 Development of Overarching Water Resources Act
- R5 Provision of Technical Assistance for the Mainstreaming of IWRM
- R6 Management of human resource allocation to programs
- R7 Identify synergies between customary environmental management practices and IWRM
- R8 Prioritisation of urban WASH programs
- R9 Prioritisation of Urban solid waste disposal
- R10 Strengthening of relationships between Water/ Sanitation / Climate sector stakeholders

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## 1 Acronyms and Abbreviations

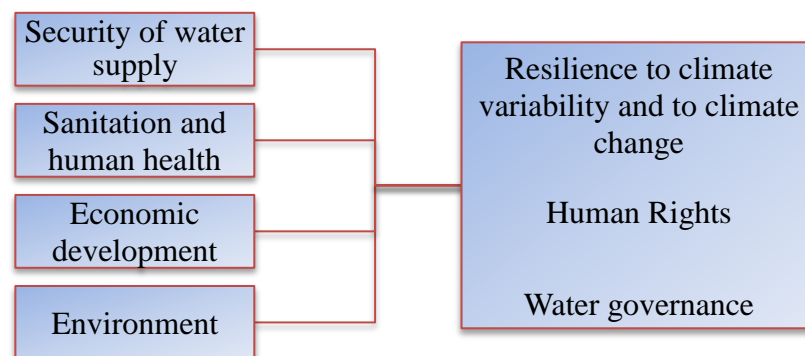
NIWCC	National Intersectorial Water Coordination Committee
ToR	Terms of Reference
SICA	Solomon Island Christian Association
IWRM	Integrated Water Resource Management
MMERE	Ministry of Mines energy and Rural Electrification
NGO	Non-Governmental Organisation
SOPAC	Pacific Islands Applied Geosciences Commission
NWAB	National Water Apex Body
SOE	State Owned Enterprise
SPREP	South Pacific Regional Environmental Programme
WHO	World Health Organisation
SPC	South Pacific Commission
UNDP	United Nations Development Programme
WGF	Water Governance Facility
SIWA	Solomon Island Water Authority
RWSS	Rural Water Supply and Sanitation
GDP	Gross Domestic Product
WRD	Water Resources Division
WatSan	Water Sanitation
PfWG	Program for Water Governance
WASH	Water, Sanitation and Hygiene
SIG	Solomon Island Government



## 2 Introduction

### 2.1 Objectives and purpose of the Outlook

The Solomon Island Water Sanitation and Climate Outlook highlights current issues and emerging threats related to water and sanitation in the Solomon Islands. Focusing on key areas of concern, the thematic areas considered include: security of water supply; sanitation and human health; economic development; and environment. These areas are assessed with regard to water governance, human rights, and resilience to climate variability and climate change (See Figure 1). The purpose of this report is to identify which issues and questions matter most to the Solomon Islands, prioritising the existing issues and emerging threats most critical to the nation's water resources and sanitation services over the next 20 years.



**Figure 1: Key thematic areas for consideration in the National Outlook.**

The National Intersectoral Water Coordination committee (NIWCC) via its multi-stakeholder platform is an appropriate forum for the development of the Outlook, providing a broad range of perspectives and priorities from an identified cross section of governmental and civil agencies. Consultation was also undertaken with a range of other organisations including, civil society, NGO's, and governmental organisations.

The identified priority issues and recommended actions are to be used to support national initiatives and the promotion of issues to government and regional agencies, implementing partners and international donors and will form the foundation of an updated regional strategy to drive regional responses, support and resources. The National Outlooks from 14 Pacific island countries will feed into a Regional Water Strategy for presentation at the Asia Pacific Water Summit in Bangkok (Jan 2012) and a Pacific position paper to be presented at the World Water Forum in Marseille. (March 2012)

Integrated Water Resource Management (IWRM) principles and practices were identified in the Pacific Regional Action Plan on Sustainable Water Management as the appropriate holistic approach for the management of water resources in small island developing states. The Solomon Islands along with 13 other Pacific Island countries were signatories to this approach on 3rd August 2002.(ADB & SOPAC 2003)

## 2.2 What is Integrated Water Resource Management (IWRM)?

A generally accepted and widely used definition is:

*“IWRM is a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”* (Global Water Partnership)

The Dublin Principles agreed to at the Rio Conference in 1992, provide the foundations and core principles of IWRM.

1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
2. Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels
3. Women play a central part in the provision, management and safeguarding of water
4. Water has an economic value in all its competing uses and should be recognised as an economic good. Within this principle, it is vital to recognise first the basic right of all human beings to have access to clean water and sanitation at an affordable price.

The competing demands of economic development, social equity and environmental maintenance on water resources need to be taken into consideration in order to achieve the best overall outcome for long term sustainable development in the Solomon Islands.

IWRM practice and principles consider water holistically from “Ridge to Reef” through consultation with all stakeholders from “Community to Cabinet”. It is not only about provision of safe water but the safe disposal of waste after we are done with it.

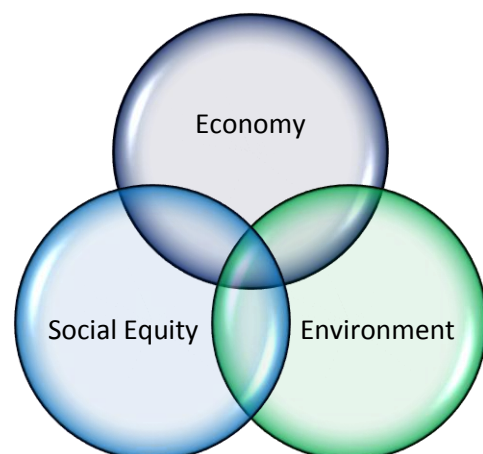


Figure 2: Competing demands on water resources

### 2.3 What is the National Intersectorial Water Coordination Committee (NIWCC)?

The Pacific Islands Applied Geoscience Commission (SOPAC) has produced a guide for Pacific Island Countries developing National Water Apex Bodies (NWAB) providing a comprehensive guide to establishing the terms of reference for the apex body including functions and roles. In the Solomon Islands the NWAB is the NIWCC.

The guide acknowledges that while the mandate of the NWAB will vary between countries depending on specific needs and situation there are generally three main functions (SOPAC 2008):

1. To prepare an overarching national action agenda for monitoring, assessment and sustainable water resources management that addresses priority issues by formulating sound policies and laws, building institutional capacity, and managing all the information generated in the planning, management and reform process;
2. To guide and coordinate water resources monitoring, assessment, planning, management and reform processes with the help of overarching work plans and frameworks for action, so that the results are consistent with the agreed expectations; and
3. To facilitate dialogue between government, non-governmental and external actors for input, support and contributions to joint, strategic and coordinated action to improve water resources management (e.g. civil society, communities, development partners, etc.).

The NWAB will generally have a technical advisory role with members from the director and senior representative level of government departments and civil society organisations, acting as an advisory group to government (SOPAC 2008). The NWAB is a mechanism for ensuring a strategic, continuous and adaptive approach to the national management of water resources. It would assist line ministries to work in a targeted way to ensure the sustainable use and protection of water resources as the foundation for human health, economic development and a productive environment.

The NIWCC had met twice prior to the workshops for this project but formal ratification and endorsement of terms of reference by Cabinet is required to give the committee formal status and ability to access funding through government ministries. The NIWCC has the potential to provide a platform for the mainstreaming of IWRM, focusing on addressing water, sanitation and climate issues. An integrated, multi stakeholder approach to water resource management is essential to ensure that all competing uses of water are considered in the development of legislation, policy and development programs.

### 3 Situation analysis (Background)

#### 3.1 Data availability and integrity

*“Data is not information,*

*information is not knowledge and*

*knowledge is not wisdom”.*

(Clifford Stoll)

Data and its integrity are fundamental to developing accurate information, quantifiable indicators, priorities, and measuring performance within any organisation. Data is scarce in the Solomon Islands where almost every division consulted for the outlook, identified incidents where historical data has been lost or is not collected and collated routinely. While international aid organisations present data on their web sites the data is generally highly variable.

Examples of data issues:

- The National health Strategic Plan 2011 – 2015 (Solomon Islands Government 2011)

*“There is serious conflict among sources which present specific values for various indicators. An analysis of demographic and health data information in July 2010 revealed that international organisations who track data for the Solomon Islands had very wide variance in their respective data presented. This began with data as basic as total country population. The variance of these “officially published” figures ranged from almost 600,000 to the low 500,000 figure.”*

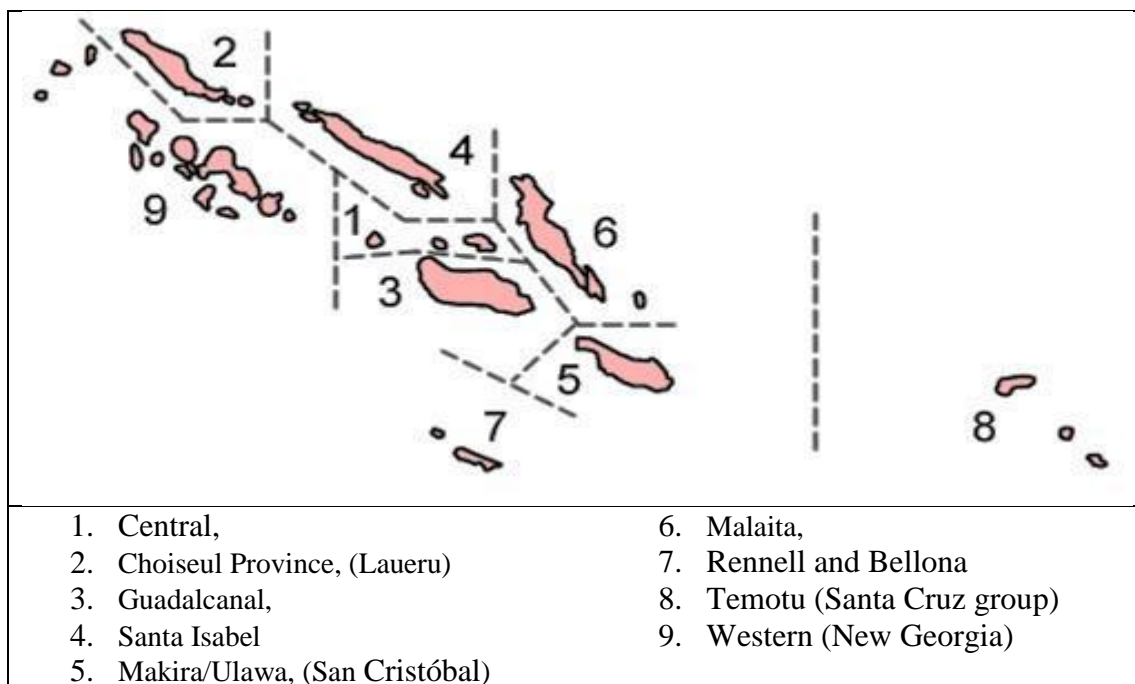
- Loss and unreliability of data due to poor monitoring and collection methodologies combined with the failure of organisations to maintain systems with backups and the resultant loss of data.
- Data stored on individual computers without back up, in individual spread sheets and without antivirus software.
- No library systems e.g. The Ministry of Environment, Meteorology and Climate Change has no system for the collation and sharing of reports. Reports are held by individual employees as either hard copies or on computer files.

To some degree these issues existed within all Ministries and SOEs consulted. During workshops sources of data were identified for follow up but the expected data was either not collected or had been lost in the majority of cases.

### 3.2 Physical

The Solomon Islands are an archipelago made up of around 992 islands with a total land area of around 28,896 km<sup>2</sup> (CIA 2011). They encompass more than 800,000 km<sup>2</sup> of sea area spread over more than 1500 km from the Bougainville Islands of Papua New Guinea in the Northwest and Vanuatu in the Southeast. Around 350 islands are inhabited including the 6 main islands (Wairiu & Powell 2006), Malaita, Santa Isabel, San Cristóbal, Choiseul, New Georgia, and the Santa Cruz group.

The Solomon Islands are divided into 10 administrative areas, with 9 provincial administrative areas with Provincial governments (See Figure 3) and Honiara Town on the northern coast of Guadalcanal administered by the Honiara City Council.



**Figure 3: Solomon Island Provincial Administrations.**

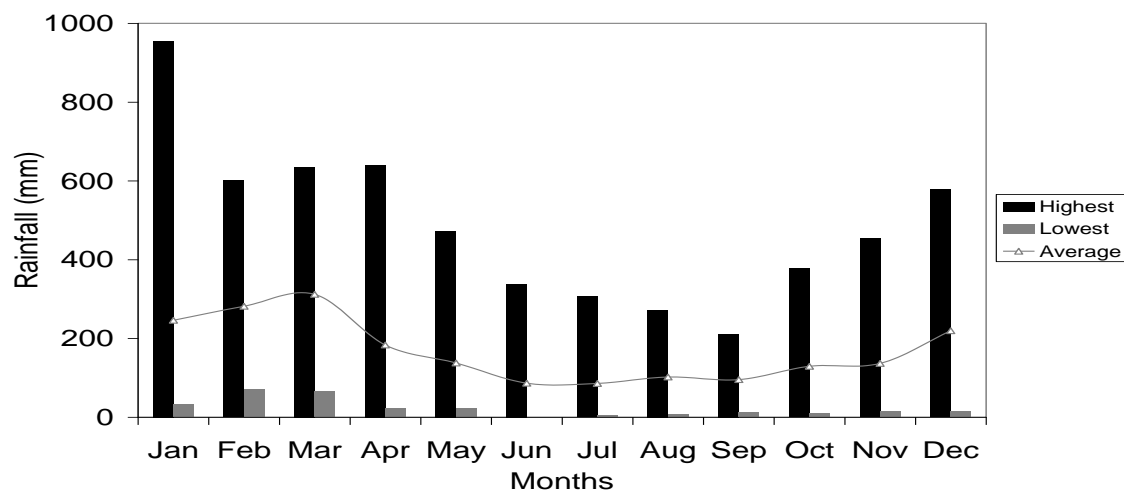
The main islands are mostly of volcanic origin with rugged and mountainous land profiles that contain relatively rich sources of mineral, hydropower and forest resources. They have numerous hydrological resources with available surface and ground water. However, the archipelago also includes low lying Coral atolls only a few meters above sea level, with no surface water, and the populations totally dependent on rain water harvesting or shallow ground water lenses.

The vast majority of the population live on the coastal fringes of the islands although there are limited areas of flat land with the only extensive coastal plains laying on the north eastern region of Guadalcanal, covering approximately 1,200 km<sup>2</sup> the exception.

### 3.3 Climate

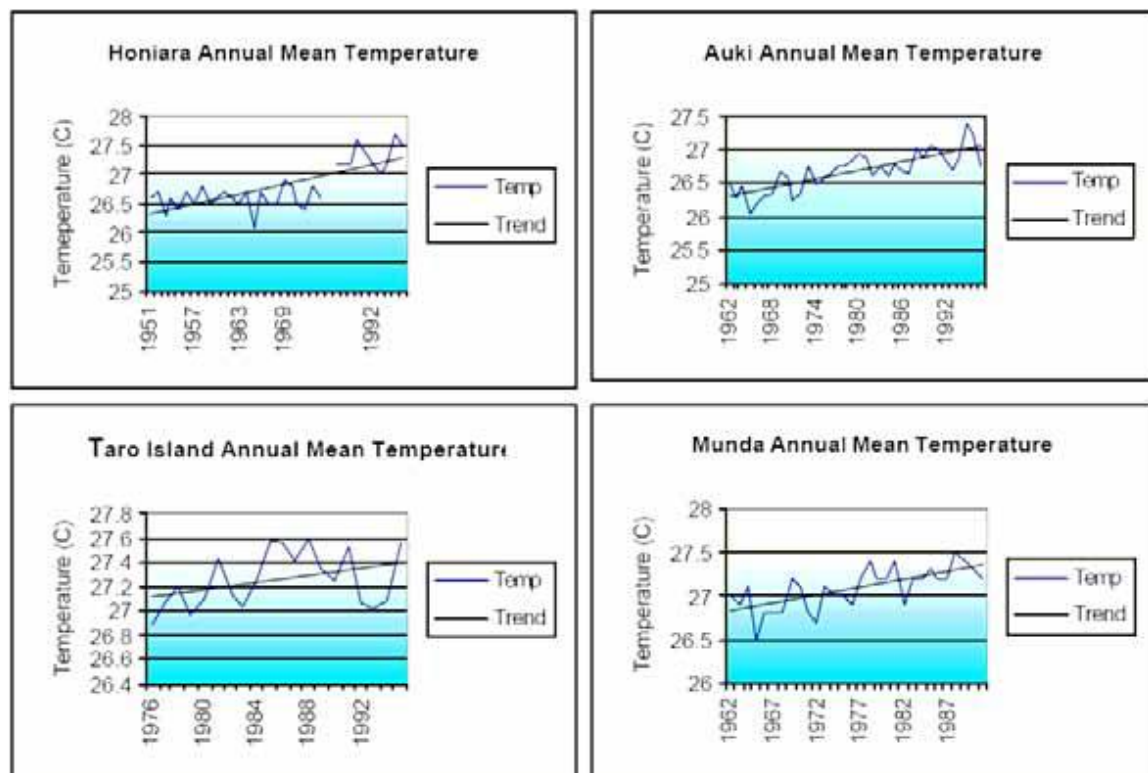
The climate is typical of many tropical areas, characterised by high and rather uniform temperature, humidity and, in most areas, abundant rainfall in all months. See Figure 4 for rainfall patterns for Honiara as representative of the Solomon Islands.

Topographical effects however cause significant variation in rainfall patterns across the archipelago and across specific islands. Rainfall is mostly in the range of 3000 to 5000 mm per year with the wettest months from November to April. (SOPAC 2007)



**Figure 4:** Average monthly rainfall for Honiara (1955-2000) representative of Solomon Islands (SOPAC 2007).

The annual mean temperature variation from 4 locations across the Solomon Islands (see Figure 5) indicate that there is a warming trend since the 1950's that is consistent with long term climate change scenarios and trends seen across the Pacific Islands region (SPREP n.d.)



**Figure 5:** temperature trends for Locations in the Solomon Islands from 1950(SPREP n.d.)

### 3.4 Environment

The forests of the Solomon Islands are a valuable natural resource due not only its extensive biodiversity, but with 80.3% (Solomon Islands National Statistics Office 2011) of the population living in rural villages the natural environment is an essential source of materials to sustain their livelihoods. Rural populations rely heavily on the natural forest for the provision of foods, medicines, firewood and building materials, with villagers emphasising that customary resource management principles and practices are still practiced to maintain the sustainable uses of resources (Danielsen et al. 2010). However the growing cash economy is replacing the traditional subsistence economies and contributing to the degradation of the natural environment as a result of overharvesting and ecosystem modification for the growing of cash crops (McIntyre 2005).

*“Awareness amongst Solomon Islands’ general population is limited, particularly in the rural areas concerning the effects of development, agricultural methods, climate change and natural disasters on water quality and quantity. Ignorance is also apparent regarding the nature of water and its finite state.” (KEW Consultants 2007, pp 75)*

Factors contributing to the loss of natural resources include: Logging; population increase; poverty and lack of cash; large-scale expansions of agricultural schemes including cocoa, coconut, teak and mahogany plantations; cattle ranches and irrigated rice cultivation; the limited political will among government decision makers to effect changes; inadequate coordination between government agencies; and minimal capacity of government agencies to monitor and enforce regulations (Danielsen et al. 2010). While these issues were reported from consultations specific to Makira Island these issues are relevant to the broader Solomon Islands.

Environmental degradation in the Solomon Islands is a major issue with uncontrolled and unsustainable logging regularly raised and discussed in all sectors of the community. With sustainable yields for round logs estimated at around 350,000 m<sup>3</sup> per year, the reported yield in 2010 was 1,428,211 m<sup>3</sup> with only 100,000 m<sup>3</sup> coming from sustainable plantations (Central Bank of Solomon Islands 2011). Current estimates are that the commercially available logs will be depleted by 2015 due to the over exploitation of this natural resource. While original forecasts would have seen the reduction in log volumes by now, the Forestry division identified re-entry to previously logged areas for smaller logs and land clearance for agricultural development as reasons for the maintenance of record harvesting levels. (Pers. Comm. April-May 2011)

Mining is expected to be the next big income earner for the Solomon Islands Government. The Gold Ridge Gold Mine is the largest mining operation in the Solomon Islands, and recommenced operations in April 2011. It is expected to become the second largest single export earner after logging (Central Bank of Solomon Islands 2011).

As the Solomon Islands seeks new sources of revenue through development care needs to be taken to ensure that community education, rules and regulations are in place to protect the environment from indiscriminate overexploitation.



### 3.5 Social

The ethnicity of the population is predominantly Melanesian (about 95%), but there are also smaller Polynesian, Micronesian, Chinese and European and other communities. The social structure is complex with in excess of 84 different dialects spoken with the most common being Pidgin English (SOPAC 2007). Customary practices vary across the country with different practices for land tenure, leadership, and codes of behaviour (Ministry of Health 2009).

Although population estimates vary, the 2009 Census showed the population of the Solomon Islands to be 515,870 with 80.3% of the population in rural communities (Solomon Islands National Statistics Office 2011).

The combination of: a high proportion of the population living in rural villages dispersed on around 350 islands; Low levels of literacy; poor road infrastructure, and lack of communication systems means that any national development programs are significantly more challenging than if the population was based on a single island (Solomon Islands Government 2011)

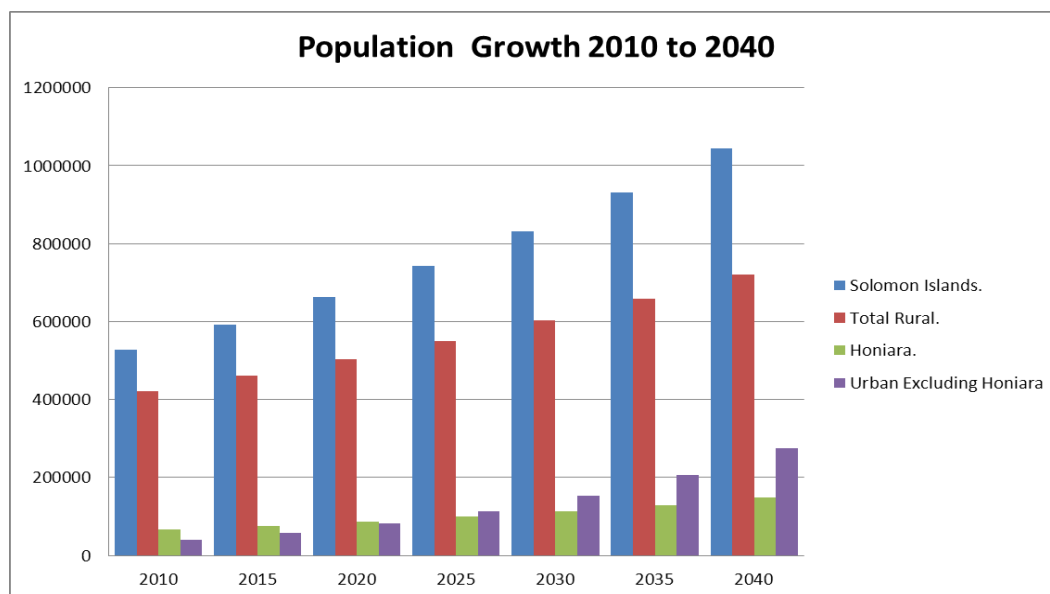
Table 1 shows the population changes between the 1999 and 2009 census data and the projected year in which the particular sector population would double based on 1999 to 2009 population growth rates.

**Table 1: Population changes 1990 to 2009 (Solomon Islands National Statistics Office 2011)**

Population Sector	Population growth rate 1999 – 2009	Year for doubling of population
Total	2.3%	2039
Urban	4.7%	2024
Urban Excluding Honiara	6.7	2019
Honiara	2.7%.	2035
Rural	1.8%	2050

Figure 6 shows the population forecasts assuming current growth rates are reflective of future growth patterns.





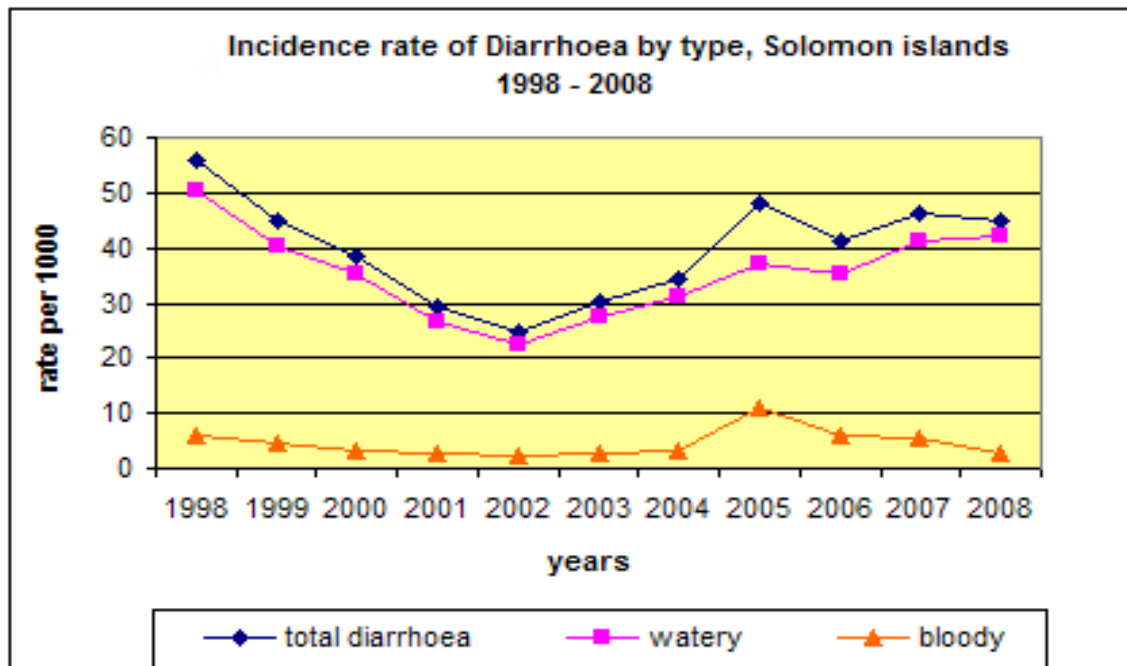
**Figure 6: Population growth 2010 to 2040 (Solomon Islands National Statistics Office 2011)**

Although the population of Honiara is growing at 2.7% per annum the Ministry of Lands, housing and survey stating that their records show that all land within the town boundary is allocated and occupied for both residential and commercial use. Accordingly there are no plans for development of residential areas to accommodate the growing population. The Guadalcanal Provincial Council in negotiation with the Ministry of Lands and the Honiara City Council has stated that there is to be no more expansion of the town boundaries despite the ongoing population growth (Pers. Comm. April-May 2011).

Without expansion of the town boundaries increased population will result in a increased population density. Already within the town boundaries homes are being built in ever more precarious locations without access to power, water or sanitation. Without government will to plan and provide for the growing population, particularly in high population density areas then the incidence of water and sanitation related diseases are likely to become increasingly significant.

The 2008 Annual Health Report, Solomon Islands (Ministry of Health 2009) shows that the incidence of Diarrheal diseases has been on a steady increase between 2002 and 2008 (See Figure 7) and noted that:

*“In general, the diarrhoea rate remains unchanged in recent years. However comparison across the provinces suggests that the incidence of diarrhoea remain highest in Honiara despite a declining pattern noted in 2008. This could be related to population density and the water and sanitation issues in the capital. This population cohort is more mobile and consequently the infection is spread across the region at a greater rate than in other provinces.”* (Ministry of Health 2009, p. 26)



**Figure 7 Incidence rate of Diarrhoea by type (Ministry of Health 2009)**

There is significant variation between incidence rates of diarrhoeal diseases per 1000 reported in Figure 7 above and the World Health Organisation figures reported in Converting Commitment Into Action (WHO & SOPAC 2008). The figure reported by the World Health Organisation (WHO) is a factor of 20 greater than that shown above. The Ministry of health figures may be reported rates whole the WHO figures may be estimated country rates. This was not able to be confirmed again highlighting the issues with data integrity and consistency. No reasons were identified in the report as to the reason that rates were dropping up until 2002 but reliability of reporting is an issue with all data reported.

SPC et al (2009) note that diarrheal incidence rates decline with improved levels of education of the mother and with access to improved water and sanitation facilities, supporting the need to ensure that an integrated approach is taken to the development of Water Sanitation and Hygiene education and development.

### 3.6 Political/ Governance

The UNDP, Water Governance Facility (WGF) (UNDP 2011) defines water governance as follows:

*“Water governance is defined by the political, social, economic and administrative systems that are in place, and which directly or indirectly affect the use, development and management of water resources and the delivery of water service delivery at different levels of society. Importantly, the water sector is a part of broader social, political and economic developments and is thus also affected by decisions outside of the water sector.”*

The Water Resources Division of the Ministry of Mines Energy and Rural Electrification (MMERE) is the Apex body for Water Resource Management in the Solomon Islands.

The duties and obligations of the Water resources division were identified by Bepapa (2008) as;

- The assessment, exploitation and conservation of water resources;
- The identification and mitigation against natural hazards such as floods, and
- The establishment of policies and legislation for the sound management and administration of water resources in the country to ensure there is safe and clean water available to the people of Solomon Islands.
- The main function of the division is to provide hydrological services.

The existing legislation in the Solomon Islands that govern and impact on water resource management are shown in Table 2.

Many of the current acts are out of date despite several programs aimed at updating them. The River Waters Act 1969, has been redrafted several times since 1992 with the latest version, the Water Resources Bill (2006) Draft. While the acts are out of date and ineffective for the management of existing Water and sanitation issues there are no policies to provide an overarching institutional framework to allow the development of integrated acts to manage water resources.

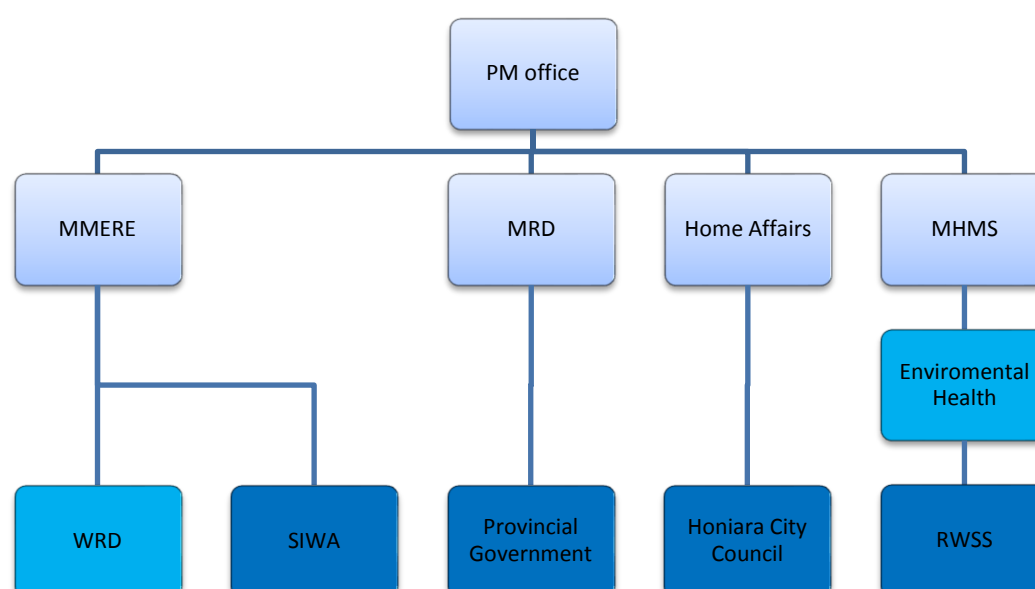
**Table 2: Acts Applicable to Water Resource Management**

<b>Act</b>	<b>Purpose</b>
River Waters Acts 1969	provides measures for watershed control in relation to rivers only and regulates the use of designated river water through permit applications
Environment Act 1998	provides for the protection, preservation and conservation of the environment, including the prevention and control of pollution to water
Solomon Islands Water Authority Act 1992	provides for the establishment of Solomon Islands Water Authority for provision of proper management and development of urban water and wastewater services throughout the country
Environmental Health Act 1998	provides for the control and management of water and sanitation services in the rural areas of the country
Lands and Titles Act 1969	provides for the allocation and control of registered land
Forestry Act 1969	provides for proper development and management of forestry sector in the country
Mines and Minerals Act 1996	provides for the promotion and management of mineral development in Solomon Islands

Water and Sanitation are managed nationally through 4 National Ministries, 3 National Divisions 9 Provincial governments, The Solomon Islands Water Authority (SIWA) and the Honiara City Council, as outlined in Table 3 with a summary of the departmental responsibilities in the provision of water and sanitation services. The reporting structure for these organisations is shown as Figure 8.

**Table 3: Water and sanitation service providers and responsibilities**

Service Provider	Responsibilities
Ministry of Mines, Energy and Rural Electrification's (MMERE), Water Resources Division (WRD)	Provision to assess, administer and manage the nation's water resources
Ministry of Health and Medical Services (MHMS) Environmental Health Division – Rural Water Supply and Sanitation (RWSS) Program	provision of providing safe water and sanitation to rural population
Solomon Islands Water Authority (SIWA)	Provision of providing safe water and wastewater services (via sewerage systems) to urban population.
Ministry of Rural Development (MRD), Provincial Governments.	Provision of providing safe water and wastewater services to urban populations not serviced by SIWA
Ministry of Home Affairs, Honiara City Council	Provision of solid waste management and sewage services for septic systems

**Figure 8: Organisational chart for Water and Sanitation service provision**

These institutional arrangements are overly complicated and rely on the Prime Minister's Office to be the central agency in the coordination of individual ministerial activities. The Ministry of Health and Medical Services through the Division of Environmental Health and the Division of Rural Water Supply and Sanitation (RWSS) are responsible for the provision of water and sanitation services to 80.3% of the population that live in rural villages while the remaining population receive water and sanitation services through SIWA, Honiara City Council and Provincial Governments.

### 3.7 Economic

The annual report of the Central Bank of the Solomon Islands (2011) reported that:

- The economy recovered strongly in 2010 following a slight decline in 2009.
- The positive outcome was attributed primarily to strong performances from primary commodities
- Challenges to future growth in Solomon Islands remain including the narrow economic base, the dominance and dependence on a declining logging sector, aid dependence, political will, and a growing population that seeks employment opportunities and demand quality social services.

In 2010 production volumes of logs grew by 37% to 1,428,211 m<sup>3</sup> as a result of firming prices, increased logging activity, back felling, and exportation of new species. 100,000 m<sup>3</sup> of exported logs was sourced from plantation timber (see Figure 9 for logging volume and process 2005 to 2010). Strong performance in forestry, agriculture and fisheries sectors contributed to an estimated real GDP growth of 7.1% and a nominal GDP per capita growth of 15% to \$US 1,272 (Central Bank of Solomon Islands 2011).

Gold production commencing in 2011 is expected to become the second largest export earner behind logs, providing a buffer against the forecast reduction in log production.

It is noted that land tenure reform program is particularly important to attract new investment to the Solomon Islands (Central Bank of Solomon Islands 2011)

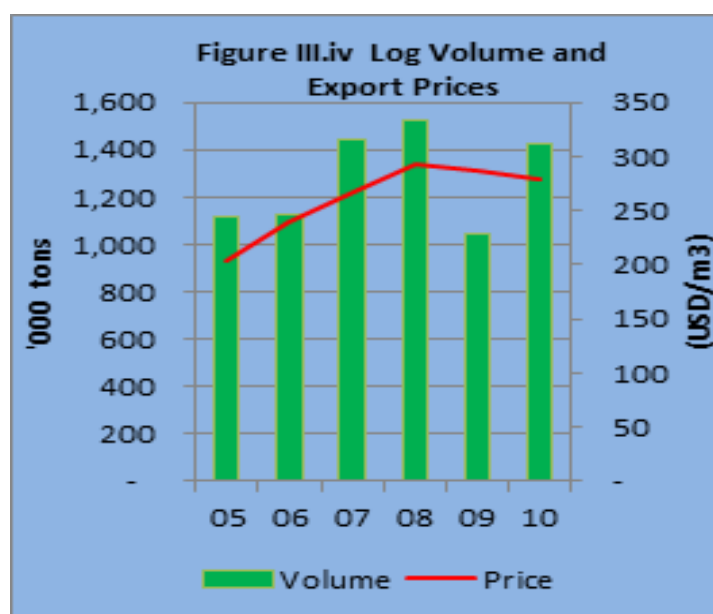


Figure 9: Log Volume and prices (Central Bank of Solomon Islands 2011)

### **3.8 Status of Water and Sanitation**

Water and sanitation has been neglected in the Solomon Islands with the result that existing infrastructure both in urban and rural settlements is in a serious state of disrepair (Pers. Comm. April-May 2011, Workshops). There are significant gaps in governance and institutional arrangements along with serious shortfalls in both human and financial capacity to provide safe water to both urban and rural communities.

Honiara in particular has significant issues with the quality of water supply (both quantity and safety), and sanitation services for the containment and disposal of both sewage and solid waste. Population growth is a major issue for provision of water and sanitation services. Currently the Solomon Island Water Authority (SIWA) provides water to 6 urban centres but has such a poor cost recovery, that they are unable to pay the electrical charges for running the systems. SIWA are continuing to increase the level of “Rationing” due to capacity constraints and there are very limited, available funds for the repair and development of infrastructure (Pers. Comm. April-May 2011, SIWA)

#### **3.8.1 Water availability**

Water resource availability varies greatly in the Solomon Islands with issues relating to the overabundance of water (flooding and salt water intrusion of low atolls) to shortages due to lack of supply (from increased population density, contamination of water sources, reliance on rain water harvesting and the impacts of climate variability). Generally, on the larger volcanic islands water is plentiful with abundant surface and ground water sources that provide reliable water supplies. However, land holder issues may limit the access to this water. At the other end of the spectrum low lying atolls do not have any source of surface water and are reliant on small ground water lenses and rain water harvesting to provide water for the maintenance of livelihoods (SOPAC 2007).

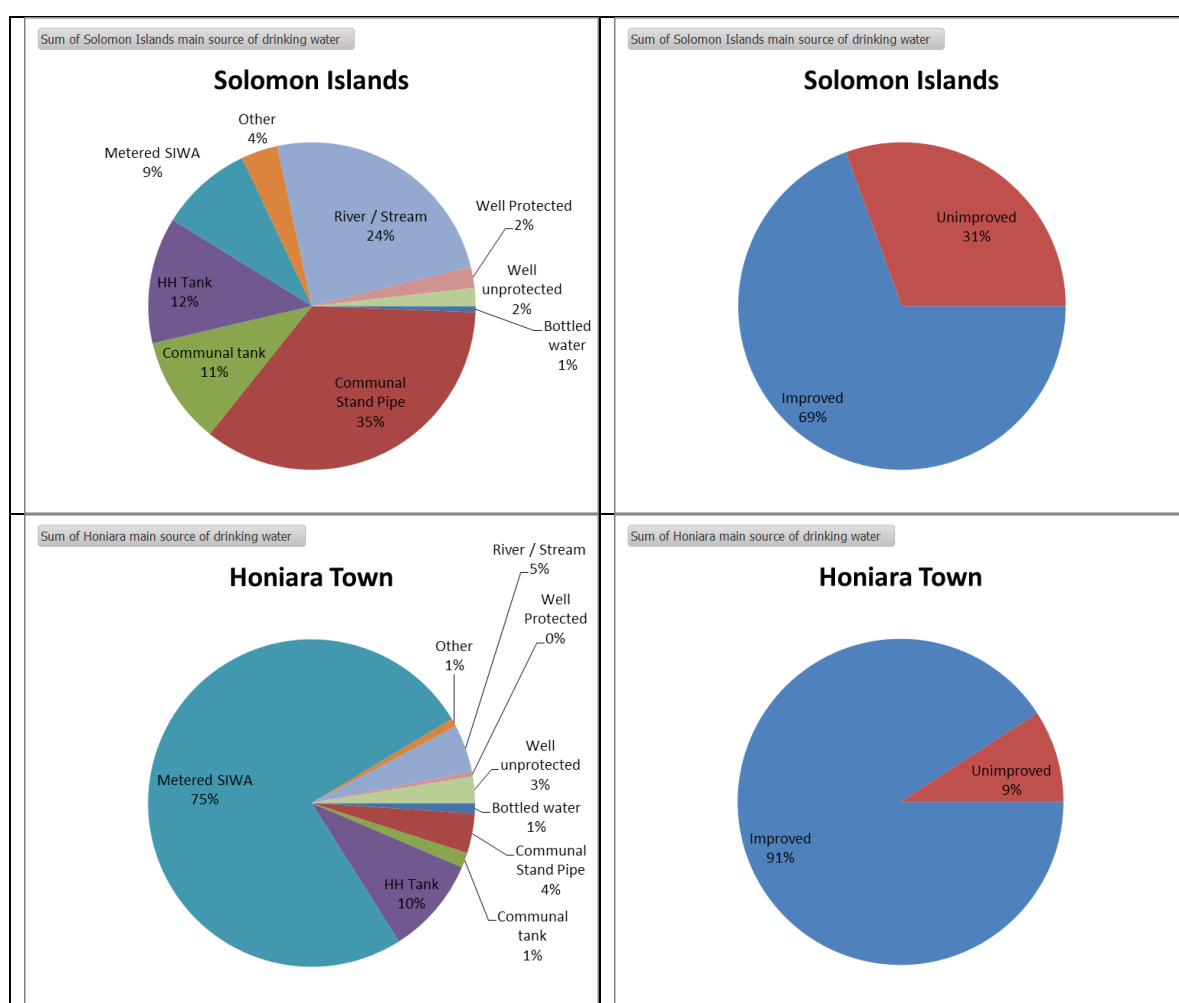
#### **3.8.2 Domestic water sources**

The 2009 household census identified the main source of water that households have available to them. Table 4 and Figure 10 present a summary of the household data presented.

From the census data it appears that Honiara has a good level of service with 91% of households having access to improved water sources, with 75% of households receiving water from SIWA. The data does not tell the whole story though with an estimated 50% of households only receiving water every 2 to 3 days and only 20% of households getting a reliable supply of water (Pers. Comm. April-May 2011). Water quality is also highly questionable with local media advising residents to boil all drinking water.

**Table 4: Main source of drinking water (Solomon Islands National Statistics Office 2011)**

	Status	Solomon Islands %	Honiara %	Non Honiara %
Metered SIWA	Improved	9%	75%	2%
Communal Stand Pipe	Improved	35%	4%	39%
HH Tank	Improved	12%	10%	13%
Communal tank	Improved	11%	1%	12%
Well Protected	Improved	2%	0%	2%
	<b>Improved</b>	<b>69%</b>	<b>91%</b>	<b>67%</b>
Well unprotected	Unimproved	2%	3%	2%
River / Stream	Unimproved	25%	5%	27%
Bottled water	Unimproved	1%	1%	1%
Other	Unimproved	4%	1%	4%
	<b>Unimproved</b>	<b>31%</b>	<b>9%</b>	<b>33%</b>
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>



**Figure 10: Main source of drinking water by household (Solomon Islands National Statistics Office 2011)**

### 3.8.2.1 Water Quality

Water quality is of an unknown measure given that although there are facilities that are theoretically capable of carrying out water quality assessments the laboratories at SIWA, Ministry of Mines Energy and Rural Electrification (MMEHE) and the National Referral Hospital are not able to carry out testing on a routine basis due to the lack of human capacity, and or the unavailability of operational equipment and resources. Neither the Ministry of Health, Honiara city council or SIWA are able to provide historical data on the quality of water in urban or rural water supplies (Pers. Comm. April-May 2011).

Urban supply of water within Honiara is chlorinated but due to the degraded condition of the network and the inability to maintain positive pressure in the system there is high likelihood that water will become contaminated due to contaminated ground water being sucked into the water mains (Pers. Comm. April-May 2011). There is a good general awareness of the need to boil water for drinking collected through both the SIWA system and collected from unimproved water sources in Honiara.

### 3.8.2.2 Water ownership

The culture of compensation is becoming ingrained in the Solomon Island psyche and is a major inhibitor to development due to land holders demanding levels of compensation for use or access through land and water that make a project's cost prohibitive. A major provider of aid in the Solomon Islands stated,

*"I do not understand the motivation of private wealth over the needs of the masses with land holders demanding massive compensation that is far beyond fair and reasonable compensation"*

In the case of the Honiara Town Supply Program the Japan International Cooperation Agency (JICA) have threatened to withhold funds for the project due to the delays in negotiating access and use of land for the development of the water supply system. Water has precedent of being considered a private good in the Solomon Islands where land ownership not only infers a right to the use of water flowing over the land but a right of ownership. The issue of ownership of water and the right of land owners for compensation for any use of the water resource even if it is not consumptive is a major stumbling block to development with examples identified including Hydro power generation, Water for urban supply, water for agricultural projects (irrigation) and even water for domestic use where the residents of a specific village unable to extract water from the nearest or best water sources (Pers. Comm. April-May 2011).

Current payments to land holders do not infer an obligation on the land holders to maintain the environmental services of the catchment to support the ongoing quality of the water supply (Pers. Comm. April-May 2011).



### 3.9 Status of sanitation services

While water appears not to be a priority for the government it holds a much higher position than sanitation. There are currently no programs to address urban sanitation issues and limited financial and human capacity of the Rural Water Supply and Sanitation (RWSS) to respond to the existing 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 this is changing with a focus on sanitation to reach the MDG goals.

Hygiene education is a key component of any water and sanitation program. However, the RWSS does not work in conjunction with the Water Resources Division (WRD) for the development of a policy and legislation for the management of WatSan at a national level.

#### 3.9.1 Toilet facilities

The 2009 household census identified the main toilet facility that households have available to them. Table 5 and Figure 11 present a summary of the household data presented.

**Table 5: Main toilet facility**

	Status	Solomon Islands %	Honiara %	Non Honiara %
Flush Private	Improved	10%	54%	5%
Flush Shared	Improved	2%	9%	2%
Water sealed Private	Improved	7%	13%	7%
Water Sealed Shared	Improved	2%	6%	2%
Pit Latrine Private	Improved	12%	11%	12%
Pit Latrine Shared	Improved	9%	3%	10%
	<b>Improved</b>	<b>43%</b>	<b>97%</b>	<b>37%</b>
Other	Unimproved	24%	2%	27%
None	Unimproved	33%	1%	36%
	<b>Unimproved</b>	<b>57%</b>	<b>3%</b>	<b>63%</b>
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>



**Figure 11: Domestic toilet facilities by household (Solomon Islands National Statistics Office 2011)**

Once again this data does not present the whole picture of the sanitation situation in the Solomon Islands. Of particular note is that the data does not take into account the actual functionality of the facilities and their capacity to isolate and contain sewage in a manner that protects the environment and general population from coming into contact with the waste.

Of the households with flush toilets in Honiara 10% of the households are connected to the SIWA operated sewerage system which routinely overflows and has outfalls that end at the shore line due to damaged infrastructure (Pers. Comm. April-May 2011).

Of concern is that there are no current programs for the repair and maintenance of sewage systems for the urban centres (Pers. Comm. April-May 2011). In Honiara sewage leachate can be seen flowing across roads and yards from ineffective septic systems and pit toilets contaminating ground water sources and surface water ways. Residents along rivers simply divert the sewage directly into the river; sewers regularly overflow; and all six sewage systems end at the shore line depositing raw sewage into the ocean within meters of residences.



**Figure 12: Sewage outfall Honiara**

### **3.9.2 Solid waste disposal**

The growing use of non-biodegradable materials in the Solomon Islands is becoming a major source of environmental contamination especially in areas of increased economic wealth and population densities. Traditional methods of disposing of organic waste are being applied to the disposal of inorganic waste with disastrous consequences (Solomon Islands Coastal Marine Resources Consultancy Services (SICFCS) 2002). Inorganic waste is accumulating all around Honiara town with the practice of disposal of waste into rivers and the ocean a particular concern resulting in the choking of water ways with inorganic waste.

The only improved method for the safe disposal of solid waste is the use of land fill in the case of Honiara. In rural villages, burying may be the most appropriate method of disposal depending on the location and design of the disposal pit.

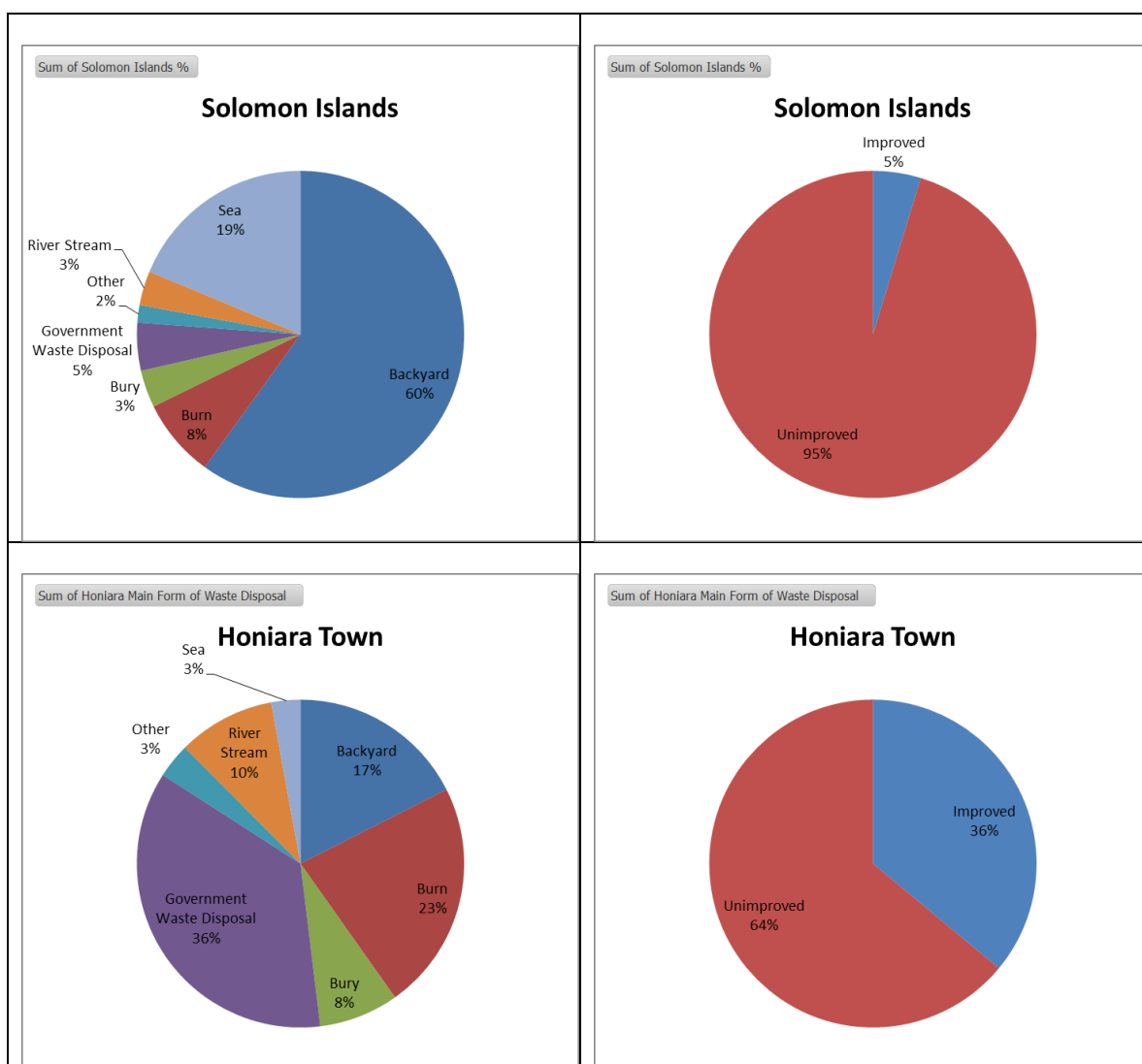


**Figure 13: Solid waste dump site into water way**

Table 6 and Figure 14 present data from the 2009 Census on waste disposal practices in Honiara and the Solomon Islands. Overall only 5% of households in the Solomon Islands make use of government waste disposal or for non-Honiara households bury their waste.

**Table 6: Main form of solid waste disposal (Solomon Islands National Statistics Office 2011)**

	Status	Solomon Islands %	Honiara %	Non Honiara %
Government Waste Disposal	Improved	5%	36%	1%
Bury	Improved	4%		
	<b>Improved</b>	<b>8%</b>	<b>36%</b>	<b>1%</b>
Bury	Unimproved		8%	3%
Burn	Unimproved	8%	23%	6%
River Stream	Unimproved	3%	10%	3%
Sea	Unimproved	19%	3%	20%
Backyard	Unimproved	60%	18%	65%
Other	Unimproved	2%	3%	2%
	<b>Unimproved</b>	<b>92%</b>	<b>64%</b>	<b>99%</b>
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>



**Figure 14: Solid waste disposal methods by household (Solomon Islands National Statistics Office 2011)**

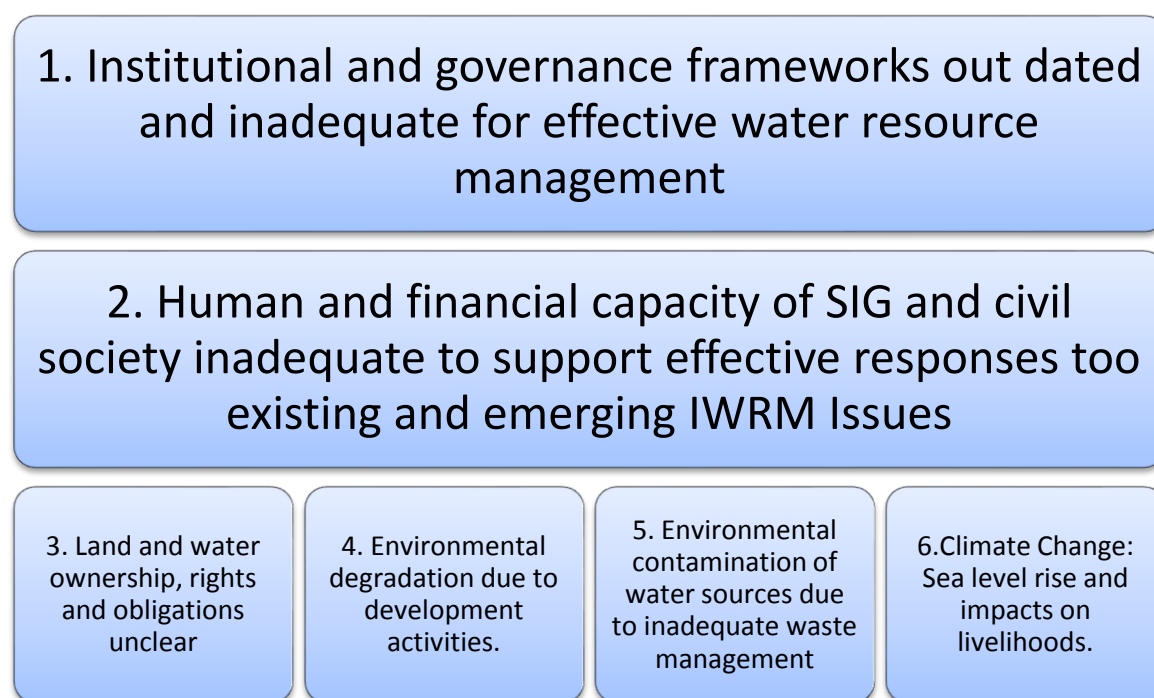
## 4 Priority Issues and Emerging Threats

Three workshops were held with stakeholder representatives of the National Intersectoral Water Coordination Committee (NIWCC) to build capacity in relation to IWRM, and for the identification and prioritisation issues relating to water, sanitation and climate in the Solomon Islands. Appendix A is an outline of the consultation process undertaken for the workshops with stakeholders consulted through workshops and individual consultation attached as Appendix B and a full list of identified stakeholders attached as appendix C.

Six core issues (see Figure 15) were identified as priorities relating to water, sanitation and climate for the Solomon Islands.

A list of prioritised issue statements was developed by the NIWCC workshop and is attached as Appendix 1D Finally the prioritised issues list was converted into 6 issues statements representing the top 10 issues and is attached as Appendix E. These statements were then discussed with a wide range of stake holders who agreed with the listed issues.

The table below outlines the priority issues impacting on water, sanitation and climate. There are significant interrelationships between the issues with human and financial capacity impacting through all sectors in the Solomon Islands.



**Figure 15: Priority issues for Water Sanitation and climate Change**

Each of the priority issues will be explored further in the following sections.



## 4.1 Governance: Institutional and governance frameworks out dated and inadequate for effective water resource management

**Workshop outcome:** *The existing institutional and governance frameworks are out dated and unable to meet the growing challenges relating to water, sanitation and climate impacts affecting the Solomon Islands.*

### 4.1.1 Discussion

Water and sanitation appear not to be a priority for the Solomon Islands government with the 2011 Policy Translation only referring to water twice in the document with one of those in reference to the Solomon Island Water Authority (SIWA). Sanitation is not mentioned at all in the policy translation, although the need to do more in rural communities is identified in the National Health Strategic Plan 2011 - 2015 (Solomon Islands Government 2011) but the focus is on rural communities with implementation through the RWSS.

There are currently no programs by government or NGO's looking at the sanitation issues currently faced by urban settlements (Pers. Comm. April-May 2011). Given that urban populations could double by 2019 this is a major concern especially with the lack of information relating to the actual condition and suitability of existing sanitation systems. Honiara in particular is of concern with no planning to meet the growing pressures of population growth.

The current institutional framework for Water and Sanitation is disjointed and proves a barrier to the ongoing development (see Figure 8). The existing institutional framework does not provide for the effective management of water resources or the provision of water and sanitation services in the Solomon Islands resulting significant gaps in coverage (i.e. no national apex body for sanitation) ineffective use of limited resources and no overarching policy or management strategy.

The Program for Water Governance PFWG report (KEW Consultants 2007) recommendations included that Government:

1. Approve the draft National Water Policy and also the Water Resource Legislation,
2. Consolidate the Water Sector Committee recommended in the draft Legislation,
3. Promote awareness and education of all the Solomon Islands citizens on the importance of water issues,
4. Empower and strengthen capacity of provinces and outer islands to manage their own water supply schemes,

Very little progress has been made in implementing the recommendations even though the PFWG developed the Draft Water Resources Bill (2006) and the National Water Resource Policy. At this time the Draft Water Resource Bill (2006) is still going through the community consultation process. The recommended Water Sector Committee (NIWCC) had met only twice prior to the development of this Outlook even though the committee is a key format for the development of cross divisional communication channels, and the building of capacity to meet the existing and emerging water, sanitation and climate threats.

The Water Resources Division is the designated Apex Body for the development of water governance and resource management in the Solomon Islands. The capacities required within the Water Resources Division have dramatically changed over recent years with the adoption of IWRM as a water resource management philosophy requiring broad stake holder engagement from “*Ridge to Reef*” and “*Community to Cabinet*”. While the Water resources division team is made of up skilled hydrologists and hydro-geologists, there has been limited development of the broad management and coordination skills required to fulfil the range of functions the division is now mandated to implement.

The Human resource and financial capacity of government organisations is a major factor in the poor performance of the Water and Sanitation sector in the Solomon Islands and will be discussed in section 4.2.

Specific issues identified at the NIWCC workshops reflected the need for the urgent action to raise the profile of water and sanitation sectors within government and the building of capacity to identify and manage responses to the current and emerging issues relating to water resource management.

#### **4.1.2 Identified issues from workshops**

The following issues were raised during workshops

- Instability of the recent and current government.
- A lack of prioritisation of water and sanitation issues by successive governments has led to the current situation where policy, governance and institutional frameworks are out-dated and ineffective in meeting the growing demands of water resource management.
- Failure to provide a clear vision through effective, overarching policy, defining goals and objectives for the future management of water and sanitation has resulted in fragmented approaches, duplication of effort and failure to develop effective institutional and governance frameworks for water resource management.
- How can people, citizens and investors have confidence when rules are not enforced and equitable access to services and benefits are not maintained?
- The lack of financial transparency was raised by all groups as significant concerns with innuendo constantly circulating about misappropriated funds.
- There are a large number of service providers and funders working to establish rural water supplies. There are currently no design guidelines and compliance requirements for the construction of water systems. Resulting in a wide range of system components making maintenance more complicated.



## 4.2 Capacity: Human and financial capacity of SIG and civil society inadequate to support effective responses too existing and emerging IWRM Issues

**Workshop outcome:** *The Solomon Islands is facing a range of significant water and Sanitation issues as a result of population growth, urban drift, economic development, and Climate change. Both the Government and Civil Society lack the human resource and financial capacity to provide effective water resource services, develop community awareness and ownership, while enforcing existing policy and legislation impacting water and sanitation services.*

### 4.2.1 Discussion

The National Health Strategy Plan 2011 – 2015 states that “*currently it can be concluded that the **majority of the problems in providing better health services and improving health status are organizational and managerial, not substantive or financial***” (Solomon Islands Government 2011, p. 48)

The Program for Water Governance (PFWG) (KEW Consultants 2007) identifies that there is both a lack of Human capacity in the form of number of qualified people and the level to which they are qualified and able to perform.

One of the most significant issues facing the mainstreaming of IWRM and the water supply and sanitation sectors is the availability of suitably qualified and experienced people with the skills to apply their knowledge effectively, to resolve issues and manage development programs.

Within the government and civil society there is also a significant lack of managerial and organisational skills to effectively develop work plans and utilise available skills. There were numerous occasions where what should have been minor road blocks became insurmountable issues that took several days or even weeks to get resolved with a high level of acceptance that, that is the way that things are and an unwillingness to take initiative. There is a critical need to address these underlying capacity issues through mentoring and development of improved management skills at all levels in the organisations. Developing institutional capacity through the promotion of awareness, participation, partnerships and knowledge management can go a long way to minimising vulnerability and enhance resilience(Wickham et al. 2009).

There are a wide range of philosophies and practices prescribed by development organisations that are expected to be mainstreamed into Solomon Island development programs. With increasing numbers of WatSan, WASH and climate adaptation programs implemented through a wide range of development organisations operating through different government and civil society agencies, there is a danger that government resources are likely to “overload” and may actually weaken overall institutional capacity.

*“just about everything is expected to be mainstreamed e.g. gender, climate change, sustainable land management, biodiversity, disaster-risk reduction etc. and it is difficult to guide government departments on how this can be practically done.”* (Wickham et al. 2009, p. 38)

The building of management skills is needed to allow Division directors to manage the workload of their department and staff with a common statement being that,

*“We spend so much time attending workshops to build capacity that we do not have the time to implement the agreements that are ratified before moving onto the next program”* (Pers. Comm. April-May 2011, Under Secretary)

#### **4.2.2 Identified issues from Workshop**

- New programs are recommended and introduced but they are not evaluated with a focus on the existing and incoming work load and capacity of implementation agency. The result is that significant workloads fall onto the few skilled effective people that exist reducing their ability to achieve sustainable implementation of programs.
- Traditional cultural norms are not incorporated into policies and legislation becoming barriers to the implementation and uptake of sanitation. Protection of the environment and human health requires that traditional methods of human waste management are adapted in order to ensure that water supplies and the environment are not contaminated with human waste.
- The financial position of the country is poor and the development of Water and Sanitation infrastructure and services is dependent on international aid and has resulted in the development of a throw away social attitude within the community where the infrastructure is the responsibility of the donor organisation rather than the community in which the services are established.
- Civil society has an essential part to play in the development and implementation of effective water and sanitation strategies. Currently the economic situation of the country means that many of the WatSan initiatives are driven through donor funds with limited community participation and development.
- Poor literacy rates and poor education levels lead to a major lack of awareness within civil society about the need for safe sanitation in order to protect water sources and the health impacts of contaminated water.
- The low level of education relating to hygiene and sanitation means that the demand for water and sanitation services in rural communities is relatively low with a high percentage of systems currently in disrepair (Estimate up to 50%) and either not operating at all or at reduced capacity.

### 4.3 Governance: Land and Water ownership, rights and obligations unclear

**Workshop outcome:** *The issues of customary land and water ownership rights are both significant issues in any program for the protection of the environment and/or access to a water resource. Customary land owners have the right to develop and exploit their land, without necessary consideration of the impact on the environment and downstream stakeholder.*

#### 4.3.1 Discussion

Customary land ownership rights and obligations is a major issue in the Solomon Islands that successive governments have been working to resolve for many years. The current government has established a Land Reform Policy in an attempt to free up land for development and resolve outstanding land disputes (Solomon Times 11 May 2011). Issues surrounding land ownership and resource management are significant, inhibiting investment and development programs and raised as a significant issue for all projects involving water resources (Pers. Comm. April-May 2011, Workshop). Customary owners shutting off water supplies to urban centres is an ongoing issue with water to Noro Township in the Western Province shut off in April 2011 when one of the land owners believed that he had not received land rental payments from the government. The water was shut off for 5 days before the dispute was settled. (Mamu 2011).

More broadly under current legislation customary land owners have the right to manage and develop their land and resources as they see fit. For example the Ministry of Forestry may designate an area of land as high ecological value or restricted logging, but this is only enforceable on alienated lands. In the case of customary land it is up to the land owner's, whether the land is logged or protected. The Ministry of Forestry has more of an advisory role than a management one for logging on customary land (Pers. Comm. April-May 2011, Under Secretary).

The Water Resources Bill (2006) Draft, states that:

- All natural water within the territory of the Solomon Islands is hereby dedicated to the use of the people of the country;
- The right to control, protect, use, investigate, manage and administer the water of the Solomon Islands is vested in the Government.

While the draft bill clarifies the ownership of water it must be implemented by the government in conjunction with the land reform policy work that is currently being undertaken.

#### 4.3.2 Identified issues from Workshop

- Although the environment act allows for the declaration of special protection areas there is currently no legal requirement for the land owners to limit activities on the land. Customary land owners have the legal right to manage and utilise the

resources on the land in the way that they see fit without a requirement to ensure that the access of downstream users to clean water is not impacted.

- Land owners consider water to be a resource that is on their land and that they have the right to control it and receive payment from any one that wishes to access and utilise the resource.
- Projects are at risk and donors walking away due to the difficulty in carrying out a project and the cost impacts of compensation demands of land holders
- As the need for a cash economy is increasing the anecdotal evidence is that the demands of the land holders are becoming greater to the point where projects are not progressing due to the extortionate amount of compensation that is being asked for.
- Due to differences in opinion between villages and landholders there have been incidents where villagers have been banned from accessing water sources because the stream is on customary land. This has resulted in the villagers having to walk much greater distances to get access to clean water

#### **4.4 Environment: Environmental degradation due to development activities**

*Workshop outcome: Land clearance as a result of logging and agricultural development has resulted in the degradation of the environment with impacts including erosion, sedimentation and soil degradation impacting water quality and availability. Livelihoods are impacted as a result of changed ecological conditions impacting food production and the availability of traditional materials sourced from the forest. Where impacts are felt between land holders there is potential for conflict*

##### **4.4.1 Discussion**

Rural water supplies in the Solomon Islands have no water treatment and are reliant on the protection of the water source for the maintenance of water safety. The pressures of population growth, urban migration and economic development mean that catchments are under ever increasing pressure of degradation and contamination impacting water availability and quality.

Logging has been the economic back bone of the Solomon Island for many years however indiscriminate overharvesting of timber is resulting in significant long term impacts on the environment.

The sale of logs is in many cases the only readily available resource that the land holder has for generating a cash income needed for, community development, the funding of school fees, and medical expenses. There is a long term down side to the over harvesting of logs though with the degradation of the environment as a result of development activities has the potential to significantly impact on the livelihoods of communities for years into the future. Impacting on the ability of the community to sustain livelihoods and make them more reliant on economic income to maintain their

existence. It is important that the long term impacts of development activities are taken into consideration if sustainable land management is to be achieved to both maintain livelihoods and provide an ongoing source of cash income.

Logging and land clearance also has an effect on climate through the reduced carbon loading on the land if forests are not allowed to revegetate. Assuming that wood density is 0.7 tonnes/m<sup>3</sup> and the carbon fraction 50 per cent of the biomass then the 2010 harvest of 1,428,211 m<sup>3</sup> would represent 500,000 tonnes of carbon making logging a significant emitter of greenhouse gasses (Danielsen et al. 2010)

While discussing IWRM the Deputy Director of The Water Resources Division noted that he would be reliant on customary environmental management knowledge to provide him a foundation for applying the principles of IWRM. Since 80% of the population in the Solomon Islands still live rurally and are heavily reliant on customary codes of practice for their subsistence livelihoods the customary knowledge relating to environmental protection should be understood and integrated with IWRM practices in order to develop strategies for water resource management.

#### **4.4.2 Identified issues from Workshop**

- Land clearance modifies the run off and absorption profiles for the land changing both the amount of water entering the ground water system and flood responses to rainfall. During periods of drought rivers and streams that have always been a secure source of water are now drying. This is a significant impact on villages relying on these streams for water sources and the changed flow regime is resulting in changed habitat and potential loss of riverine animals.
- Threats to food security are resulting from: nutrient losses from already poor soils; climatic conditions present drought or flood conditions resulting in decreasing crop yields and crop failure
- Logging and land clearance opens up land for agricultural development. Where these areas are within the catchment for domestic water supplies this may cause issues with contamination of untreated water supplies.
- Logging camps are often built over or beside water ways that are used for disposal of human, industrial and solid waste.
- Changed river flood and low flow patterns are resulting from changed land use and clearance due to logging. Combined with climate variability issues the changed conditions are putting pressure on existing ecosystems

Some specific threats identified by the workshop emerging over the next 10 years if nothing is done include;

- Increased water shortage (increase runoff & less storage),
- Poor water quality (increase sediment loads in storage),
- Loss of biodiversity (includes endemic species),
- Loss of top soil (nutrients depletion),
- Lower food production.

## 4.5 Security of Supply: Environmental contamination of water sources due to inadequate waste management

*Workshop Outcome: Lack of effective waste management systems for the containment and treatment of both domestic and industrial waste is having a significant impact on the contamination of the environment with raw sewage, chemical and solid waste. The resulting contamination and degradation of both surface and ground water sources is having a significant impact in the health of people within the affected environments into which the waste is deposited.*

### 4.5.1 Discussion

The issue of environmental contamination was raised primarily with a focus on higher population density urban centres with Honiara a particular concern with water ways not only contaminated with human sewage through leaching and direct piping of sewage into water ways, but the disposal of solid waste into rivers and directly into the ocean.

Urban centres are at particular risk with populations expected to double by 2019 and in the case of Honiara all land for housing already allocated and currently no options to expand the town boundary combine with no current projects to address the sanitation issues within the city (Pers. Comm. April-May 2011, Ministry of Lands Housing and Survey).

Census 2009 data for Honiara shows that 97% of households have access to improved sanitation there is no measure of how appropriate that sanitation system is and its effectiveness in avoiding environmental contamination of the sewage leachate.

- 10% of the households in Honiara have connection to the six SIWA sewerage systems. The six outfalls provide no treatment and discharge directly into the ocean within meters of the shoreline **Error! Reference source not found..** he majority of septic sludge that is pumped from tanks is also discharged through these outfalls (Pers. Comm. April-May 2011, Honiara City Council)

Neither the Honiara Environmental Health Department nor the Ministry of Health have indicators as to the level of environmental contamination in Honiara but the issue is raised frequently in literature and is evident with even a short walk into the suburbs of Honiara.

While there are regulations relating to the disposal of waste they are not enforced, and walking around Honiara the smell of raw sewage and evidence of leachate are common occurrences. Figure 16 shows toilet facilities on the Motaniko River in Honiara as viewed from the road.

Since 2002 there has been a steady increase in the reported rate of dysentery treated at medical centres after the rate falling up until 2002 (See Figure 7) While the national health statistics are showing a reduction in the mortality rate due to dysentery, loss of productive capacity will impact on the livelihood capacity the family of individuals infected.





**Figure 16: Toilet discharges Mataniko River Honiara**

The regional risk of disease was highlighted by a cholera outbreak in Buka, Bougainville, Papua New Guinea in which as of 30 April 2011 had already killed more than 600 people and affected more than 10,000. The ministry of health in conjunction with Oxfam was carrying out significant community awareness promotion of the health risks posed and the need for vigilant hygiene practices (Palmer 2011).

With urban population growth rate at 4.7% the urban population is expected to double by 2019 (See section 3.5). Without urgent attention to sanitation infrastructure and community behaviour relating to waste disposal there will be significantly greater contamination of the environment with both sewage and solid waste greatly impacting on environmental and human health.

#### **4.5.2 Identified issues from workshops**

- With urban drift and greater economic wealth particularly in Honiara are major issues with waste disposal from domestic and industrial sources. Traditional practices of disposing of organic waste include burying, burning and disposal into water sways has continued but with the increasing levels of plastic, metal and chemical waste significant environmental contamination is occurring.
- Environmental contamination is not only a concern for natural water ways but SIWA supplies passing through contaminated ground may siphon in contaminated water to the system due to failure to maintain positive pressure in the water reticulation system and leakage from water pipes.

- Loss of traditional water from surface and ground water sources is requiring people to utilise rain water harvesting but the cost of this is high due to the capital investment required for the provision of rain water tanks.
- Aging Sewerage systems that do not treat sewage but transfer it to the coastal outfalls.
- Increased risk of water borne diseases due to poor uptake of effective sanitation systems. Due to low education and low awareness and demand within the community.

## 4.6 Climate: Sea Level Rise and Impacts on livelihoods

*Workshop outcome: Sea level raise as a result of climate change is impacting not only small atoll islands but also coastal zones of larger islands where there is increased erosion and salt water intrusion into traditional water sources*

### 4.6.1 Introduction

Climate change and variation were identified as issues within all thematic areas considered in workshops with the NIWCC. Generally it was considered that climate is a significant threat to future livelihoods in the Solomon Islands exacerbating the existing issues with development reducing the resilience of the natural environment to withstand climatic shocks. There was however limited awareness of specific issues that will impact the Solomon Islands as a result of climate change and variation.

Sea level rise gets a lot of press in the Solomon Islands and was identified by the committee as the priority climate issue facing the Solomon Islands. While sea level rise is a major threat to the long term viability of low lying coral atolls and coastal villages with a current average sea level change of 3.5 mm per year the impacts of sea level rise is not expected to be significant on a national scale within the time frame of this outlook (SPREP n.d.). Coastal erosion has been observed over a number of years but at a faster rate in recent years. Sea level rise needs to be taken into consideration for all future programs including water and sanitation in order to minimise impacts from climate change and variability.(SPREP n.d.)

Climate vulnerability and adaptation projects and programs are currently a major focus for aid agencies with numerous projects being implemented by a range of aid organisations through a number of in country agencies. A national body, the Solomon Islands Advisory Committee on Climate Change (SIACCC), as the advisory body on scientific, technical, policy and management issues is called for (SPREP n.d.) under the Pacific Adaptation to Climate Change program. This committee calls on many of the same organisations as the NIWCC. Coordination of committees needs to be managed across sectors to ensure that key personal do not become overburdened.

Climate is a major consideration in water resource management and planning but there is very little communication between the Water Resource Division and the



Division of Climate Change outside of formal workshops. There is a need to develop forums to allow greater information sharing not only of data but of upcoming projects and programs.

Climate change will be a major impediment to the achievement of sustainable development as all economic and social sectors are likely to be adversely affected, and the cost of adaptation will be disproportionately high, relative to GDP (SPREP n.d.). Projects aim to build capacities of individuals, communities and governments so that they are more able to make informed decisions about adaptation to climate change and to enhance their adaptive capacity in the long run.

#### **4.6.2 Identified issues from workshops**

- Changes in temperature and rainfall patterns are impacting the way that ecosystem function and is exacerbating issues relating to food production, with agricultural yields reducing due to disease and failed crops as a result of drought and flood events.
- Greater prevalence of disease vectors with changed climatic conditions favouring mosquito activity with increasing temperature mosquito activity may increase in areas that have had low activity levels in the past.
- Exacerbation of a wide range of issues identified in previous sections with greater variation in rainfall patterns resulting in longer droughts and bigger floods.
- Clearance of rainforest is reducing the resilience of the environment to withstand variation in rainfall patterns.
- Seal level rise inundating low lying atolls and coastal areas with increased erosion damaging existing infrastructure.
- Specific impacts of the issue over the next 10 years if nothing is done
  - Loss of land & habitat (food security)
  - Reduced water security
  - Loss of infrastructure

## 5 Recommendations

The following list of recommendations address's the priority issues identified in section 4. The recommendations for water governance issues reflect those in the PfWG (KEW Consultants 2007). However the author has elaborated on those recommendations in order to address the current lack of progress being made in prioritising water and sanitation issues and achieving the mainstreaming of IWRM.

### 5.1 Governance

Integrated Water Resource Management was identified in 2002 as the appropriate principles and practice to be used for the implementation of water resource management (ADB & SOPAC 2003) but to date the vast majority of government and civil society agencies impacting water resources are unaware of IWRM principles and practices.

The outputs of the Program for Water Governance (PfWG), the Water Resources (2006) Bill and the Water Resources Policy are the latest proposed legislation and policy updates but to date, there has been very little progress made in implementing the recommendations. The first step in developing awareness of water resource issues and formulating suitable responses must be the development of terms of reference and endorsement of the NIWCC as the Apex Body for Water Resource management. In order for this to succeed this must be supported with technical assistance and funding to manage the function of the committee through its establishment and to raise awareness and capacity through mentoring in IWRM principles and practices. (See section 5.2).

#### **R1 Formation and Endorsement of a Water Resources Apex Body**

**National Water Apex Body, (committee / commission) established and endorsed by cabinet to support and consult on water resource management in the Solomon Islands. This committee should;**

- Include stake holders from major sectors having direct impact on water resources including;
- Be established with consideration of other recommended committees (e.g. climate change) and through consultation develop a mandate that will allow the one committee to become the central focal point for all water resource related issues.
- Promotion of water resource management issues and IWRM principles and practices to government and civil society organisations.

Communication between divisions is poor but there is a real need for greater communication of programs and emerging issues between governmental divisions and ministries. The NIWCC is a suitable format for Apex bodies to share their knowledge and concerns with stakeholders impacting water resource management

The introduction of IWRM as a water resource management principle and process in the Solomon Islands is a relatively new concept. IWRM requires a significantly wider consultation and operational mandate than historical water resource management and

hydrological services provided by the Division of Water Resources. It is appropriate at this time to review the current institutional framework for water and sanitation service provision in the Solomon Islands identifying gaps and clarifying roles and operational mandates in order to make best use of resources for future development.

## **R2      Review and Clarification of the Terms of Reference for the Water Resources and Sanitation management authorities**

- The current institutional arrangements do not adequately provide for effective management of water or sanitation services.
- There is opportunity to better align duties and functions with the core capabilities and capacities of various organisations.
- With the growing urban drift and the resulting increase in population densities and the blurring of rural and urban, it is essential to not only improve infrastructure but develop community awareness in relation to Water Sanitation and Hygiene (WASH).
- In an environment where human capacity is limited it is essential that duplication of accountabilities and duties between organisations is minimised.

The Program for Water Governance developed the Water Resources Bill (2006) Draft and Draft Water Resources Policy. The Solomon Island Government has a poor record in relation to its capacity to enforce legislation, in light of this and the contentious land reform policy currently being implemented, it is recommended that consultation and endorsement of the Water Resources Bill (2006) Draft should be made a second priority to the consultation and endorsement of the Water Resources Policy. There is currently no Water Resource Management / Sanitation / IWRM policy. Stakeholders are currently developing policies independently of each other (Pers. Comm. April-May 2011, RWSS). It is essential that a national water resources policy be developed to provide a vision and framework for the management of water resources and legislation by stakeholders.

## **R3      Development and endorsement of overarching Water Resources Policy**

- Provide a vision for the protection and management of water resources for the Solomon Islands for future generations
- Apply the Principles and practices of IWRM
- Establishing a single policy for water resource management inclusive of Water, sanitation and climate issues will provide a single framework for ministries to operate under and ensure that a holistic approach is taken.
- This policy should be developed through the Water resources committee.

#### **R4 Development of Overarching Water Resources Act**

- Confirm government commitment to the Water Resources Bill (2006) Draft
- Water Resources Bill (2006) Draft progressed and endorsed through the NIWCC.
- Consultations to be completed and bill to be submitted to parliament
- Should be a priority once the Water Resources Policy is accepted.

### **5.2 Human and Financial Capacity**

There is a need for significant investment in water and sanitation infrastructure both in urban and rural communities, but this investment will be wasted if appropriate capacity development of individuals and institutions is not undertaken. There is a need to build capacity for the implementation of programs rather than just being focused on project outcomes. Fundamental skills for effective management of both human and capital resources within government departments and civil society need to be developed to develop empowered teams with the skills to achieve sustainable development. External support is essential to the mainstreaming of IWRM and to support the water and sanitation sectors in addressing existing issues and emerging threats. With both a lack of qualified staff and the work overload of skilled staff there is a need for the provision of in country support.

#### **R5 Provision of Technical Assistance for the Mainstreaming of IWRM**

Mainstreaming of IWRM principles and practices needs a dedicated resource to support the Water Resources Division and the NIWCC to;

- promote, educate and support IWRM initiatives,
- provide support of water, sanitation and climate related programs and initiatives,
- provide technical assistance to the committee where appropriate,
- identify interdepartmental synergies,
- mentor key operational staff

Located in the Water Resource division The Technical Assistance will assist in capacity development for the division to take an ongoing lead role in mainstreaming IWRM in the Solomon Islands.

Human resources are limited in the Solomon Islands but a large number of projects and programs are being initiated through external donors, regional organisations and within the Solomon Island Government. Greater emphasis must be placed on the management of human resources to ensure the management of workloads and to allow programs to be properly supported.

## **R6 Management of human resource allocation to programs**

Without management of human resource and work load management individuals may become over worked and ineffective across a range of initiatives due to being unable to allocate the required time to successfully implement agreed actions as opposed to not having the skills to complete the tasks.

A registry of all programs being undertaken and allocated human resources needs to be maintained and managed to balance workloads. The secretariat of the NIWCC could carry out this role.

## **5.3 Governance: Customary land ownership rights and obligations**

This is possibly the biggest hurdle to economic development in the Solomon Islands. The Solomon Island Government is currently undertaking a Land Management Program to mainstream customary land ownership rules into legislation and develop a register of customary land holders but it is beyond the scope of this report.

Current arrangements for water rights with customary land holders is a compensation system where the volume of water taken is paid for but there is no obligation on the land holder to protect the water source to maintain water quality. Payment for environmental services may be a suitable mechanism for to allow the customary owners of land to receive payment while obliging them to maintain the environment to protect the water source.

## **5.4 Environmental degradation**

The ongoing development of the cash economy makes access to cash important for most communities. Forests are an asset that rural communities have available to them as a cash crop, that once cleared may provide land for developing agriculture that will provide an ongoing source of income.

Current legislation and governmental enforcement capacity is inadequate and out dated for the management of activities taking place on customary land. It is essential the links between development activities and impacts on the environment and water resources be clearly identified with unified and consistent messages being communicated to communities through the various field staff and community development programs being undertaken.

Without enforceable legislation, community engagement and agreement with land holders is the only way to protect environmental resources. Identifying common objectives and values will enhance results.

#### **R7 Identify synergies between customary environmental management practices and IWRM**

- Customary codes and practices often provide for the protection of the environment and water resources since these are both essential to traditional subsistence livelihood. It is important to respect and understand traditional knowledge if the mainstreaming of IWRM is to be successful in implementing sustainable, water, sanitation, hygiene, and climate initiatives in the Solomon Islands.
- Identify opportunities to coordinate Water Resource and Environmental messages e.g. with Ministry of Forestry Reforestation Division. To utilise existing community consultation networks.

### **5.5 Security of Supply contamination**

Containment of faecal waste is essential to maintain environmental sanitation and minimising the spread of disease particularly in high density population areas where the potential for epidemic outbreaks is greatest. Without faecal containment soil and water become contaminated and disease can be spread by vectors including consumption of contaminated water, contact with the soil, animals and flies. In Honiara the status of the sewage system is very poor with leakage through the system and infrastructure ending on the sea shore meters from people's homes. Septic systems are poorly maintained with leachate contaminating soil and entering water ways. Pit latrines are often built in inappropriate locations where leachate will contaminate the environment and water sources. To get the maximum benefit water, sanitation and hygiene education (WASH) must be implemented into the community together.

#### **R8 Prioritisation of urban WASH programs**

Action is required to raise the profile and urgency attached to the sanitation issues in urban centres with both the Government and NGO's. Major funding for infrastructure and community development is required to address the existing issues and make plans to accommodate the doubling of the urban population expected by 2019.

Issues include;

- Failing infrastructure
- Lack of investment in infrastructure
- Lack of appropriate technologies
- Severe environmental contamination
- Lack of urban planning
- Poor community awareness and capacity (financial and education)
- Lack of funding
- Currently not a priority for government.

Human activities produce as wide range of wastes and environmental pollutants. The ability of the environment to treat our natural organic wastes (sewage, food, etc.) has

been utilised for centuries by communities all over the world but the environment has its limits and where population densities are high then the environment just cannot cope and becomes polluted. In the case of plastics and modern waste the natural environment is unable to treat them and they accumulate, whether buried in a municipal dump or disposed of into water ways.

#### **R9 Prioritisation of Urban solid waste disposal**

- Without the provision of adequate reliable solid waste disposal local communities will continue to maintain existing practices since they will not have access to an alternate solution.
- Care must be taken however to avoid the development of the situation where others come along and clean up after them if they do not dispose of waste correctly.
- Community pride and ownership of the clean environment is essential

### **5.6 Climate**

Climate change is a major focus for funding agencies in the Solomon Islands with programs in all sectors looking to address vulnerability and adaptation issues. Water resource management is often at the core of these programmes. Recommendations already made will contribute to more effective support and coordination for climate orientated programs.

#### **R10 Strengthening of relationships between Water/ Sanitation Sector stakeholders**

- Climate has a significant impact on all aspects of water resource management and the sustainability of livelihoods particularly in rural communities.
- The NIWCC is an appropriate platform for consultation and capacity building across the Water resource sector in relation to climate change with IWRM providing appropriate principles and practices for the mainstreaming of Climate adaptation across the sector.
- A close working relationship between the Water resources Division and Division of Climate change will assist the mainstreaming of both programs.

## 6 Conclusions

The Solomon Islands faces a wide range of issues relating to Water Sanitation and Climate but they generally come back to the core issues identified in this report. Human resources both the number of skilled people and their capacity to cope with the demands on their time are major issues that currently limit the successful outcomes of projects. With the traditional project approach to development several consultations noted that even where demonstration project was successful it is seldom able to be rolled out to other communities, due to constraints in funding and human resources. There is a need to provide assistance not only on a project basis with short term consultations but on a program basis to work with the organisation to assist and mentor individuals over a longer term to contribute to the objectives of the organisation.

There are numerous projects aimed at addressing identified issues but these do not appear to focus enough on developing the capacity within the organisations to carry out the day to day operational tasks, which improve efficiency through addressing day to day operational issues, while building higher level capabilities in the organisation. Training courses are a critical component of capacity development there is also a need to ensure that adequate support is given to the in country teams to allow them to implement their learning's and address the issues they feel are important.

The NIWCC is a critical step in the mainstreaming of IWRM principles and practices but without external technical support and funding to raise the profile of the committee within the government and promote IWRM principles and practice the committee will not be sustainable due to the time pressures that most of the members are already under.



## 7 References

ADB & SOPAC 2003, *Pacific Regional Action Plan on Sustainable Water Management*, Suva Fiji.

Bepapa, C 2008, *National Adaptation Programme of Actions (NAPA)*, Ministry of Mines, Energy and Rural Electrification, , Honiara, Solomon Islands.

Central Bank of Solomon Islands 2011, *2010 CBSI Annual Report*, Central Bank of Solomon Islands, Honiara.

CIA 2011, *CIA World Fact Book*, viewed April 2011, <<https://www.cia.gov/library/publications/the-world-factbook/fields/2032.html>>.

Danielsen, F, Filardi, CE, Jønsson, KA, Kohaia, V, Krabbe, N, Kristensen, JB, Moyle, RG, Pikacha, P, Poulsen, MK & Sørensen, MK 2010, 'Endemic avifaunal biodiversity and tropical forest loss in Makira, a mountainous Pacific island', *Singapore Journal of Tropical Geography*, vol. 31, no. 1, pp. 100-14.

KEW Consultants 2007, *Solomon Islands Water Governance Programme*.

Mamu, M 2011, 'Water woes: Noro faces shutdown if dry taps continue', *Solomon Star*, 6/4/2011.

McIntyre, M 2005, *Pacific Environmental Outlook*, South Pacific Regional Environment Programme (SPREP), Apia.

Ministry of Health 2009, *Annual Health Report 2008, Solomon Islands*, Ministry of Health, Division of Planning and Policy, National Health Statistics Office, Honiara.

Palmer, E 2011, 'Cholera irks Oxfam International ', *Solomon Star*.

Pers. Comm. April-May 2011, Honiara, April to May.

Solomon Islands Coastal Marine Resources Consultancy Services (SICFCS) 2002, *SOLOMON ISLANDS NATIONAL ASSESSMENT: Synopsis of Issues, Activities, Needs, and Constraints: Sustainable Development 1992-2002*, , JOHANNESBURG.

Ministry of Health and Medical Services 2011, *National Health Strategic Plan: 2011 - 2015*, by Solomon Islands Government, Solomon Islands Government.

Solomon Islands National Statistics Office 2011, *Solomon Islands 2009 Population and Housing Census: Basic Tables and Census Description*, Solomon Islands Government, Honiara.

Solomon Times 11 May 2011, 'Solomon Islands Undertakes Crucial Land Reforms', *Solomon Times*.

**SOPAC 2007, *National Integrated Water Resource Management and Diagnostic Report, Solomon Islands*, SOPAC, Suva, Fiji.**

**SOPAC 2008, *NATIONAL WATER APEX BODIES - a guide for Pacific Island Countries*, SOPAC.**

**SPC, Solomon Islands National Statistics Office & Macro International Inc 2009, *Solomon Islands Demographic and Health Survey 2006-2007*, Secretariat of the Pacific Community, Noumea, New Caledonia.**

**SPREP n.d., *PACIFIC ADAPTATION TO CLIMATE CHANGE SOLOMON ISLANDS: REPORT OF IN-COUNTRY CONSULTATIONS*, SPREP, Apia.**

**UNDP 2011, *What is water Governance?*, UNDP Water Governance Facility (WGF), viewed May 2011,  
<<http://www.watergovernance.org/whatiswatergovernance>>.**

**Wairiu, M & Powell, B 2006, *Situation Analysis Report Solomon Islands*, Australian Water Research Facility, Brisbane.**

**WHO & SOPAC 2008, *Sanitation, hygiene and drinking-water in the Pacific island countries : converting commitment into action*, World Health Organisation, Manila.**

**Wickham, F, Kinch, J & Lal, P 2009, *Institutional Capacity within Melanesian Countries to Effectively Respond to Climate Change Impacts, with a Focus on Vanuatu and the Solomon Islands*, Apia: SPREP.**

# **Appendix**

## **A. Consultation process**

### **Initial Approach and Planning**

A strategic planning meeting was held with the Director and Deputy Director of the Water Resources Division (WRD) to develop a strategy for engagement with the NIWCC for the development of the Outlook.

The committee had only met twice in the past with low attendance and the only outcome that a Terms of reference should be developed and submitted to cabinet for endorsement prior to the NIWCC commencing further meetings, It was determined that consultations should;

- Focus on the development of the outlook and gaining input from stakeholders,
- Present the concept of Integrated Water Resource Management,
- Introduce the principles and practices of IWRM developing understanding of the need for an intersectorial approach to water resource management,
- Maintain focus on the issues relating to Water, Sanitation and Climate that are a priority for the Solomon Islands.
- Avoid defining operational functionality of the committee.

The first Workshop was scheduled for 8 April 2008.

### **Workshop 1**

The agenda for the first workshop was,

- presentation of;
  - Introduction to IWRM,
  - Introduction to the National Water , Sanitation and Climate Outlook

Followed by discussion and break out groups to brainstorm and identify issues relating to water, sanitation and climate. Each group then presented the identified issues to the workshop.

No one attending the workshop had heard of IWRM, this was discussed with the WRD who were not surprised by this. During the introduction to IWRM there were a number of relevant questions and a general consensus that IWRM principles and practices were a valuable and appropriate theology for the management of water resources.

The introduction to the outlook highlighted the need for this program to be heavily inclusive to reflect the opinions of the Solomon Islands and needed to not only consider existing symptoms but some of the underlying issues and priority issues.

General comments were that it is about time that something like this was undertaken since water and sanitation are major issues for the majority of residents in the Solomon Islands.

The afternoon session was a breakout into small groups and brainstorming of issues relating to the thematic areas for consideration in the outlook. Each group then reported back on the identified issues to the workshop.

The resulting brainstormed issues were typed up and circulated with the meeting minutes. The identified “issues” were divided up into issue, symptom and actions for review by the committee members with the intention that we would have individual consultations to further develop the outlook. This proved fruitless due to the difficulty in making contact with people and getting appointment times. The decision was then made to continue utilising workshops.

## **Workshop 2**

The objectives of the second workshop were to word statements reflecting the identified issues from the first workshop, and prioritise the most significant issues. 21 issue statements were developed and ranked by scoring each issue with a ranking of 1 to 5 for environmental impact, economic impact and social impact. These scores were then totalled ranked from highest to lowest score. Several of the stated issues had similar themes and were combined into the final prioritized issues list. This was then emailed out to all participants with a request for information and feedback on the list stating agreement or disagreement of the identified issues.

Email was proving to be an ineffective communication tool with very little feedback received.

With the prioritised list in hand consultations with organisations including government, Church, and NGO’s was commenced, at these meetings the priority issues were presented for consideration and comment. There was unanimous agreement that the issues identified were significant issues that not only impact on water resources but unilaterally across all areas of responsibility for the divisions. During these consultations the scarcity of information became apparent with very little data, current or historical available, although there were plenty of opinions. The openness of participants was appreciated and surprising since they were often critical of their own departments past and present performance.

## **Workshop 3**

The objectives of this workshop were to improve participants knowledge of IWRM with a review of IWRM principles and practices, introduce the IWRM demonstration project in the Solomon Islands and present an overview of the status of water and sanitation and climate issues in the Solomon islands relative to other pacific countries and developed countries.

The structure of the workshop was;

- Opening presentation on regional indicators and where the Solomon Islands sit in relation other pacific island countries
- A review of IWRM and the outlook purpose
- An introduction to the GEF funded IWRM demonstration project.

The afternoon session again involved small group work, on the identified issues for contribution to the outlook with findings presented to the workshop by each group.

## **Workshop 4**

Recommendations relating to each of the identified issues were presented at a final meeting along with expected outcomes resulting from the recommendations. There was

opportunity for feedback, comments and questions with the attendees concluded that the recommendations are appropriate and reflect the discussions and views presented by the committee.



## B. Summary of contact details for workshop attendees and consultations.

Contact Details	Contact Type	Stake holding / Influence
<b>AusAID</b>		
Angellah Kingmele <a href="mailto:angellah.kingmele@ausaid.gov.au">angellah.kingmele@ausaid.gov.au</a>	Consultation	AusAID coordinator for Water Sanitation program, VSI TA reports to her.
Peter O'Conner Counsellor, Development Cooperation <a href="mailto:Peter.O'Connor@ausaid.gov.au">Peter.O'Connor@ausaid.gov.au</a> +67 (7) 7494316 +67 (7) 21561 ext. 361	Consultation	AusAID Coordinator but not dealing with water with water and sanitation.
<b>Development Services Exchange</b>		
Collin B Ruqebatu General Secretary <a href="mailto:cbruqebatu@gmail.com">cbruqebatu@gmail.com</a> +67 (7) 23760	Workshop participant	Apex body for NGO representation in the Solomon islands.
<b>Honiara City Council</b>		
Tom Nanau Chief Health Inspector <a href="mailto:tnanau@gmail.com">tnanau@gmail.com</a> +67 (7) 7512852 +67 (7) 28294	Workshop participant	Responsibility for environmental health in Honiara
<b>JICA</b>		
Yoko Asano Project formulation Advisor <a href="mailto:si_oso_rep@jica.go.jp">si_oso_rep@jica.go.jp</a> +67 (7) 24107 +67 (7) 24174	Consultation	JICA providing funding to SIWA for water infrastructure program, looking to fund Solid waste program for Honiara.
Yoshinobu Takishita Resident Representative <a href="mailto:si_oso_rep@jica.go.jp">si_oso_rep@jica.go.jp</a> +67 (7) 24107 +67 (7) 24174	Consultation	JICA significant funder of Water and infrastructure programs in the Solomon islands
<b>MECDM Environment Division</b>		
Edward Danitofea <a href="mailto:edward.danitofea@gmail.com">edward.danitofea@gmail.com</a>	Workshop participant	Ministry of Environment is an important player in IWRM practice.
<b>Min. Agriculture and Livestock</b>		
Jimi Safea U.S. Agriculture <a href="mailto:j-safea@yahoo.com">j-safea@yahoo.com</a>	Consultation	Single consultation but interested in the IWRM project good open discussion and potential supporter
Michael Ho'ota (Hotmail) U.S. Agriculture <a href="mailto:michaeltapa@hotmail.com">michaeltapa@hotmail.com</a>	Consultation Workshop participant	Interested in the IWRM project good open discussion and potential supporter
Hearly Afupule Dep. Director Livestock <a href="mailto:haleveh_aq@yahoo.co.nz">haleveh_aq@yahoo.co.nz</a>	Consultation	Interested in the IWRM project good open discussion and potential supporter

Contact Details	Contact Type	Stake holding / Influence
Victor Kaiuou Dep. Director Agriculture <a href="mailto:kaihouvictor@yahoo.com">kaihouvictor@yahoo.com</a> +67 (7) 22143	Consultation	Interested in the IWRM project good open discussion and potential supporter
William Okekini Planning Officer <a href="mailto:okekini@gmail.com">okekini@gmail.com</a> +67 (7) 22143	Consultation	Interested in the IWRM project good open discussion and potential supporter
Peter Trena Chief Information Officer <a href="mailto:ptrena70@gmail.com">ptrena70@gmail.com</a> (06) 741 5400 +67 (7) 22143	Consultation	Information manager for Ministry of Agriculture. Good contact for accessing their library.
<b>Min. Development Planning &amp; Aid Coordination</b>		
Barnabas Bago Principal Planning Officer <a href="mailto:bbago@planning.gov.sb">bbago@planning.gov.sb</a> +67 (7) 38255	Workshop participant	Attendance of workshops, good contribution. Aid and planning coordination liaises with government funders for development of aid programs.
<b>Min. Environment, Conservation &amp; Disaster Management (Meteorology)</b>		
Hudson Kauhiona Deputy director <a href="mailto:hkhiona@yahoo.com">hkhiona@yahoo.com</a> +67 (7) 23031	Workshop participant	Meteorology is an important part of water resource management with rainfall data and forecasts critical to planning.
<b>Min. Environment, Conservation &amp; Meteorology (Climate Change)</b>		
Douglas Yee Director <a href="mailto:d.yee@met.gov.sb">d.yee@met.gov.sb</a>	Consultation Workshop participant	Climate Change is the emerging issue globally with significant impacts on water and the environment.
Lloyd Tahani Deputy Director <a href="mailto:l.tahani@met.gov.sb">l.tahani@met.gov.sb</a> +67 (7) 27658 +67 (7) 38071	Workshop participant	As above
Sharon Tohaimae Attached Staff <a href="mailto:tshagah@gmail.com">tshagah@gmail.com</a> +67 (7) 7424793 +67 (7) 23031 +67 (7) 24074	Workshop participant	As above
<b>Min. Health and Medical Services</b>		

Contact Details	Contact Type	Stake holding / Influence
Baakai Kamoriki Chief Medical Statistics <a href="mailto:biakoba@moh.gov.sb">biakoba@moh.gov.sb</a> +67 (7) 25443	Consultation	Medical statistics office in the ministry of health contact for report on disease rates and medical statistics.
<b>Min. Mines, Energy &amp; Rural Electrification (Energy)</b>		
Toswell Kaua Project Officer <a href="mailto:toswellk@yahoo.com">toswellk@yahoo.com</a> +677 (7) 21522 ext. 206	Workshop participant	Water utilised for Hydro projects for sustainable power programs.
<b>Min. Women, Youth and Children Affairs</b>		
Eva Wagapu Women Development Training Officer <a href="mailto:Eva.wagapu@gmail.com">Eva.wagapu@gmail.com</a> +67 (7) 7482819 +67 (7) 26316	Workshop participant	Women's representative on the NIWCC.
<b>Ministry of Finance</b>		
Nick Gagahe National Statistician <a href="mailto:ngagahe@mof.gov.sb">ngagahe@mof.gov.sb</a> +67 (7) 23951	Consultation	Stats office holds unpublished data.
<b>Ministry of Forestry</b>		
Terrence Titulu Director of Management <a href="mailto:ttitulu@yahoo.com.au">ttitulu@yahoo.com.au</a>	Workshop participant	Forestry has a major impact on environment.
Richard Roamae Dir. Forest research, Development and Reforestation <a href="mailto:roamaerichy@yahoo.com.au">roamaerichy@yahoo.com.au</a>	Consultation	Supportive of IWRM with synergies for community consultations with 35 field operatives.
<b>Ministry of Health (Environmental Health)</b>		
Chris Ruku Director (Ag) <a href="mailto:cruku@moh.gov.sb">cruku@moh.gov.sb</a> +67 (7) 25513 +67 (7) 20830	Workshop participant	Responsible for WatSan services to rural communities.
Jack Filomea Environmental sanitation <a href="mailto:jfilomea@moh.gov.sb">jfilomea@moh.gov.sb</a>	Workshop participant	Just completed master's degree with final thesis in water governance. RWSS.

<b>Ministry of Mines Energy and Rural Electrification</b>		
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Contact Details	Contact Type	Stake holding / Influence
Charlie Bepapa Director of Water Resources <a href="mailto:bepapa_charlie@hotmail.com">bepapa_charlie@hotmail.com</a> +67 (7) 7475006 +67 (7) 21522 ext.209	Consultation Workshop participant	Water resources Division is the Apex body for IWRM, Water governance and Hydrological services.
Isaac Lekelalu Deputy Director Water Resources <a href="mailto:i_lekelalu@hotmail.com">i_lekelalu@hotmail.com</a> (06) 744 5466 +67 (7) 7445466	Consultation Workshop participant	Water resources Division is the Apex body for IWRM, Water governance and Hydrological services.
Richard Molea Senior Program Coordinator <a href="mailto:rmolea123@gmail.com">rmolea123@gmail.com</a> +67 (7) 7510632 +677 (7) 21522 ext. 204	Consultation Workshop participant	Water resources Division is the Apex body for IWRM, Water governance and Hydrological services.
Michael Maehaka Chief Hydrologist <a href="mailto:maehaka@mines.gov.sb">maehaka@mines.gov.sb</a> +677 (7) 21522 ext. 204	Consultation Workshop participant	Water resources Division is the Apex body for IWRM, Water governance and Hydrological services.
<b>Secretariat of the Pacific Community</b>		
Mia Rimon Coordinator <a href="mailto:MiaR@spc.int">MiaR@spc.int</a> +677 (749) 7998 +677 25543	Consultation	SOPAC is now part of SPC with Mia the in country coordinator.
<b>SIWA</b>		
Marista Kapini Technical officer <a href="mailto:mkapini@siwa.com.sb">mkapini@siwa.com.sb</a> +67 (7) 23985	Workshop participant	SIWA are responsible for the supply of water and Sewerage services to Honiara and other Urban centres.
Ray Andresen SIWA Chief Engineer <a href="mailto:randresen@siwa.com.sb">randresen@siwa.com.sb</a> +67 (7) 7479542 +67 (7) 23985 /4 /3	Workshop participant	SIWA are responsible for the supply of water and Sewerage services to Honiara and other Urban centres.
Richard Austin General Manager +67 (7) 24028	Consultation	SIWA are responsible for the supply of water and Sewerage services to Honiara and other Urban centres.
<b>Solomon Island Christian Association (SICA)</b>		
James Funa General Secretary <a href="mailto:jamesfuna@yahoo.com">jamesfuna@yahoo.com</a> +67 (7) 750 7668	Consultation	SICA represents 90% of churches in the Solomon Islands. An important and influential part of island culture.
<b>Voice Belong Mary</b>		

Contact Details	Contact Type	Stake holding / Influence
Olga Chapangi <a href="mailto:vbms@solomon.com.sb">vbms@solomon.com.sb</a>	Workshop participant	Women's group representative NGO.
<b>VSI</b>		
Piter Visser TA RWSS, Dept. of Health, Solomon Islands <a href="mailto:pvisser@moh.gov.sb">pvisser@moh.gov.sb</a> +677 7575025	Consultation Workshop participant	TA with RWSS working on Policy and legislation while supporting M. health involvement in the NIWCC. Focus on rural water and sanitation program.

## C. Stakeholder analysis

### C.1. NIWCC identified in the Draft Terms of Reference for the

In accordance with the National Intersectoral Water Coordination Committee, Terms of Reference, Solomon Islands, August, 2009 the committee will be made up of the following representatives.

1. Permanent Secretary, Ministry of Mines, Energy & Rural Electrification(Chairman)
2. Director Water Resources, Ministry of Mines, Energy & Rural Electrification(Vice)
3. Director of Energy, Ministry of Mines, Energy and Rural Electrification
4. Director of Research, Ministry of Agriculture and Livestock
5. Principal Planning Office for Natural Resources-Economic Sector, Ministry of Development Planning & Aid Coordination
6. Director of Fisheries, Ministry of Fisheries and Marine Resources
7. Under Secretary, Ministry of Environment, Conservation & Meteorology
8. Director of Environmental Health, Ministry of Health and Medical Services
9. Commissioner of Land, Ministry of Lands and Survey
10. Attorney Generals Chambers, Ministry of Justice and Legal Affairs
11. Representative, Ministry Commerce, Investment and Trade
12. Representative, NGO (General Secretary, DSE and/or SIDT)
13. General Manager, Solomon Islands Water Authority
14. Women Representative (NCW)

See below for a comprehensive stakeholder list.

Review of varying literature identifies the following as stakeholders in Water Sanitation and climate Change in the Solomon Islands. Further details will be added throughout the project.

## C.2. Political Stakeholders

Stakeholder Group	Contact	Position /Role	Stake holding / Influence
<b>Prime Minister's Office</b>			
<b>Ministry of Agriculture and Livestock</b>	Alfred Measulia NIWCC	Under Secretary	Agriculture and livestock management have a significant impact on water resources quality and availability
<b>Ministry of Commerce, Industry Labour and Immigration</b>			Commercial and industrial growth requires adequate supplies of water of the right quality for growth but also have the potential too adversely impact on water quality if development is not managed.
<b>Ministry of Culture and Tourism</b>	Martha Horiwapu NIWCC	Tourism Officer	Eco Tourism has the potential to be a significant income earner for the Solomon Islands
<b>Ministry of National Planning and Aid Coordination</b>	Barnabas Bago NIWCC	Principal Planning Officer	Coordination of the allocation of aid funding.
<b>Ministry of Education and Human Resources Development</b>			Development of education curriculum to ensure that children are getting effective hygiene and environment awareness education is essential to the long term development awareness for future generations.
<b>Ministry of Mines Energy and Rural Electrification</b>			The department of Water Resources resides within this ministry and is the focal division for IWRM and Governance initiatives. Mining and energy are 2 sectors that can have significant impacts on W.S and CC
Energy	John Korinihona NIWCC	Director of Energy	Alternative energy sources being sought to end the reliance on diesel generators
Geology	Clinton Roga NIWCC	Geochemist (Geological Sciences Division)	Provision of assessments on the erosion characteristic of soils etc supporting Forestry and agricultural land uses

<b>Stakeholder Group</b>	<b>Contact</b>	<b>Position /Role</b>	<b>Stake holding / Influence</b>
Water resources	Charlie Bepapa NIWCC	Director of Water Resources	Water resources division provides hydrological services for supply of water to urban and rural populations as well as for major projects such as Hydropower
	Isaac Lekelalu NIWCC	Deputy Director of Water Resources	Manager of IWRRM GEF program
	Richard Molea NIWCC	Program Coordinator Water Resources	Governance and policy manager
<b>Ministry of Environment, Conservation and Meteorology</b>	Rence Sore NIWCC	Permanent Secretary	Environmental protection carrying out EIA's and authority to designate protected areas. Meteorological data is critical to water and CC management
Climate change			
<b>Ministry of Finance and Treasury</b>			Funding is essential for the on-going operation of initiatives. Subsidies and financial incentives can also have detrimental unintended consequences for the environment
<b>Ministry of Forestry</b>			Logging s a major income earner for the country but has also had a devastating impact on the environment impacting water resources, livelihoods and resilience to climate variation.
<b>Ministry of Health and Medical Services</b>			
Environmental health	Chris Ruku NIWCC	Director of Environmental Health (Ag)	Provision on Water and Sanitation services to rural communities as well as the management of vector borne diseases and operation of health services
<b>Ministry of Home Affairs</b>			
National disaster management			National disaster management and response.

Stakeholder Group	Contact	Position /Role	Stake holding / Influence
<b>Ministry of Infrastructure and Development</b>			Manages major infrastructure projects including that require consideration of environmental impacts and effects on water flows and possible future impacts to the project of climate change
<b>Ministry of Lands, Housing and Survey</b>			Control of urban development and construction of residential dwellings in a planned manner to allow connection too water and sanitation services is a major issue in Honiara. The resilience of the land to withstand severe weather events also needs to be taken into consideration in land use planning
<b>Ministry of Provincial Government and Institutional Strengthening</b>			Provincial governments have responsibilities relating to water, sanitation and climate change resilience.
<b>Ministry of Rural Development and Indigenous Affairs</b>			
<b>Ministry of Woman, Youth and Children Affairs</b>			It is essential to take the needs of women, youth and children into consideration in IWRM programs. Responsible for gender mainstreaming and development programs to improve capacity particularly in rural areas.
Youth			
Children			
Women development	Eva Wagapu NIWCC	Women Development Officer	
<b>Solomon Islands Water Authority</b>	Ray Andresen NIWCC	SIWA Manager Engineering	Provision of water and sanitation services to designated urban settlements including Honiara.
	Richard Austin	SIWA General Manager	Provision of water and sanitation services to designated urban settlements including Honiara.

Stakeholder Group	Contact	Position /Role	Stake holding / Influence
<b>Solomon Islands Electrical Authority</b>			Responsibilities for the generation and distribution of electrical power including hydro power proposals.
<b>Provincial Councils</b>			Manage water supply in Provincial urban areas that are not managed by SIWA
<b>City Councils</b>	NIWCC Tom Nanu		Honiara city council has responsibility for maintenance and disposal of human waste where the system is not connected to the sewer system and solid waste management within the city boundaries.

### C.3. Community Stakeholders

Stakeholder Group	Organisation / Name	Position /Role	Stake holding / Influence
Industry groups / Business councils			Civil society representation for Industry and commerce.
Landowners	NIWCC Peter Pukuvati	Kongulai Water Source	Position is not fixed on the NIWCC with representative to be relevant to the Province / Area that is under consideration
Church Leaders/ Ministers	SICA James Funa	General secretary	Very influential role in Solomon Island culture
Village Council of Chiefs			Promoting support at the village level where appropriate
Community based health and first aid officers / volunteers			Promote sanitation and hygiene within the community
Men's groups in the Village			Toilet facility has to be used by all parties.
Women's groups in the village			Women are primarily responsible for sanitation in the home
Solomon Islands School for Higher Education			School could be used as a mechanism for capacity building in the community through structured learning.
School Council			Utilise existing Education facilities for community education

Stakeholder Group	Organisation / Name	Position /Role	Stake holding / Influence
School children			School could be used as a mechanism for capacity building in the community through structured learning.

#### C.4. Aid Organisation Stakeholders

<i>Stakeholder Group</i>	Contact	Position /Role	Stake holding / Influence
<b><i>Aid Organisations</i></b>			
JICA	Yoshinobu Takishita	Resident Representative	Provision of funding and Technical support for infrastructure programs
SOPAC UNDP UNEP GEF			Financiers and sponsors' of the Pacific IWRM Project currently underway providing 14 demonstration projects in PICs
Development Services Exchange			Provision of water and sanitation services
Solomon Island Development Trust			Provision of water and sanitation services
SEI Action Group			Provision of water and sanitation services
World Vision			Provision of water and sanitation services
Save the Children Fund (Australia)			Provision of water and sanitation services
Solomon Islands Christian Association (SICA)			Peak body representing churches
<b><i>Volunteers</i></b>			

<b><i>Stakeholder Group</i></b>	<b>Contact</b>	<b>Position /Role</b>	<b>Stake holding / Influence</b>
Volunteer services overseas (UK)			Provision of Technical Assistance personal
Volunteer Services Abroad (NZ)			Provision of Technical Assistance personal
Peace Corps (USA)			Provision of Technical Assistance personal
Australian volunteers Abroad			Provision of Technical Assistance personal
Volunteer Services International			Provision of Technical Assistance personal.
<b><i>External Support</i></b>			
Australia International Development Assistance bureau			Provision of funding and Technical assistance
New Zealand Overseas Development agency			Provision of funding and Technical assistance
World Health Organisation (WHO)			Provision of funding and Technical assistance
United Nations Development Program (UNDP)			Provision of funding and Technical assistance
Rotary International			Provision of funding and Technical assistance
Adventist Development relief agency (ADRA)			Provision of funding and Technical assistance



## D. Workshop 2 Identification of issues and prioritisation

Topic	Issue	Economic	Environment	Social	Score
Health	Loss of livelihood food sources due to changed plant diseases, farming practices and soil degradation.	5	5	5	15
Governance	Lack of water governance, out-dated acts and poor institutional coordination	5	5	5	15
Environment	Land clearing practices due to logging and agricultural practices Erosion and sedimentation. Degradation of environment due to poor control of development, resulting in degradation of water and conflict with downstream users	5	5	5	15
Environment	Climate change and sea level rise resulting in sea water intrusion and loss of productive lands, and ground water sources	5	5	5	15
Governance	Capacity of government and civil society to manage water and the impacts of population growth and development cultural barrier and awareness	4	5	4	13
Security of Supply	Contamination of existing water sources, Ground water and surface water. Pollution and saline intrusion	5	3	4	12
Health	Capacity of civil society to deal with changing water and sanitation issues as a result of environmental degradation, population change and climate variability. Awareness and ownership of issues.	4	4	4	12
Governance	Poor access to and use of sanitation services for the containment and treatment of Sewage and solid waste	4	5	3	12
Governance	Water ownership and customary land ownership,,	5	3	4	12
Governance	No river basin management structure with Land holders are able to do whatever they wish on their land without consideration of downstream users and impact on water quality.	5	3	4	12
Environment	Environmental impacts are leading to loss of traditional livelihoods	4	4	4	12
Environment	State of the environment report (2008) for latest loss of ecosystems due to development	4	5	3	12
Security of Supply	Access to safe water for domestic consumption Quantity and Quality	5	1	5	11
Security of Supply	Lack of infrastructure for the supply of potable water rural and urban.	5	1	5	11
Sanitation	Lack of access to safe sanitation due to awareness, finance, materials, appropriate technology that meets cultural norms.	3	4	4	11
Sanitation	Solid waste management and disposal	2	5	4	11
Sanitation	Cost of infrastructure and sustainability	2	4	4	10
Governance	Poor information and data management with inequitable access to information	3	3	3	9
Security of Supply	Lack of diversity of water supply for both urban and rural settlements	4	1	3	8
Security of Supply	Cost of infrastructure and sustainability of supply,, Rain water tanks, RWSS supply, Sanitation urban supply	3	1	4	8

## E. Development of top issues statements Work Shop 2

Review of top identified issues identified through assessment in relation to environmental, economic and social impacts at workshop held Friday 29<sup>th</sup>, April at the RWSS meeting Room.

Statement of issue from meeting	Rewording of statement of issue.
1 Governance: #2 15 points	1. Governance: Institutional and Governance Frameworks.
<i>Lack of water governance, out-dated acts and poor institutional coordination, compliance, financial transparency</i>	<i>Existing institutional and governance frameworks are out dated and are unable to meet the growing challenges relating to water, sanitation and climate change impacts affecting the Solomon Islands</i>
2 Governance: #5 15 points: #7 12 Points: #8 12 Points	2. Governance: Human and financial capacity
<i>Capacity of government and civil society to manage water and the impacts of population growth and development cultural barrier and awareness</i>	<i>The Solomon Islands is facing a range of significant water and Sanitation issues as a result of population growth, urban drift, economic development, and Climate change. Both the Government and Civil Society lack the human resource and financial capacity to provide effective services, develop community awareness and ownership, while enforcing existing policy and legislation impacting water and sanitation services.</i>
<i>Capacity of civil society to deal with changing water and sanitation issues as a result of environmental degradation, population change and climate variability. Awareness and ownership of issues.</i>	
<i>Poor access to and use of sanitation services for the containment and treatment of Sewage and solid waste</i>	
3 Governance (Security of Water Supply) # 9 12 points: # 10 12 points:	3. Governance: Land and Water ownership, rights and obligations.
<i>Water ownership and customary land ownership,,</i>	<i>The issues of customary land and water ownership rights are both significant issues in any program for the protection of the environment and/or access to a water resource. Customary land owners have the right to develop and exploit their land as they see fit without necessary consideration of the impact on the environment and downstream stakeholder.</i>
<i>No river basin management structure with Land holders are able to do whatever they wish on their land without consideration of downstream users and impact on water quality.</i>	
Statement of issue from meeting	Rewording of statement of issue.

Statement of issue from meeting	Rewording of statement of issue.
4 Health: #1 15 points Environment: #3 15 points:	4. Environmental: Degradation of catchments and impact on water availability and livelihoods.
<i>Loss of livelihood food sources due to changed plant diseases, farming practices and soil degradation</i>	<i>Land clearance as a result of logging and agricultural development has resulted in the degradation of the environment with impacts including erosion, sedimentation and soil degradation impacting water quality and availability. Livelihoods are impacted as a result of changed ecological conditions impacting food production and the availability of traditional materials sourced from the forest. Where impacts are felt between land holders there is potential for conflict</i>
<i>Land clearing practices due to logging and agricultural practices Erosion and sedimentation. Degradation of environment due to poor control of development, resulting in degradation of water and conflict with downstream users</i>	
6 Security: of Supply #6 12 points:	5. Security of supply: Contamination of water sources and environmental degradation
<i>Contamination of existing water sources, Ground water and surface water. Pollution</i>	<i>Lack of effective waste management systems for the containment and treatment of both domestic and industrial waste is having a significant impact on the contamination of the environment with raw sewage and solid waste. The resulting contamination and degradation of both surface and ground water sources is having a significant impact in the health of people within the affected environments into which the waste is deposited.</i>
7 Environment: #4 15 points:	6. Climate Change: Sea level rise.
<i>Climate change and sea level rise resulting in sea water intrusion and loss of productive lands, and ground water sources</i>	<i>Sea level raise as a result of climate change is impacting not only small atoll islands but also coastal zones of larger islands where there is increased erosion and salt water intrusion into traditional water sources</i>