



**United Nations Development Programme
Country: Solomon Islands
PROJECT DOCUMENT¹**

Project Title: Solomon Islands Water Sector Adaptation Project (SIWSAP)

UNDAF Outcome(s): Improved resilience of PICTs, with particular focus on communities, through integrated implementation of sustainable environmental management, climate change adaptation/mitigation, and disaster risk management

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Growth is inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded (Outcome 1)

UNDP Strategic Plan Secondary Outcome: Countries have strengthened institutions to progressively deliver universal access to basic services (Outcome 3)

Expected UNDAF Outputs: 1.1.1 - Strengthened capacity to integrate and implement policies/strategies for environmental sustainability, disaster risk reduction/management and climate change adaptation and mitigation at national level

1.1.3 - Strengthened national capacity for effective management of natural and water resources, renewable energy, waste, land and land rehabilitation that promote good agricultural practices for conservation of the environment and biodiversity.

Executing Entity/Implementing Partner: Government of the Solomon Islands, Ministry of Mines, Energy and Rural Electrification, Water Resources Division (MMERE-WRD)

Implementing Entity/Responsible Partners: Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM); Ministry of Health and Medical Services – Environmental Health Division, Ministry of Development, Planning, and Aid Coordination, UNDP

Programme Period:	4 years
Atlas Award ID:	TBD
Project ID (UNDP):	TBD
PIMS #	4568
Start date:	July 2014
End Date:	June 2018
Management Arrangements:	NIM
PAC Meeting Date:	12 December 2013

Total resources required	\$ 50,472,462
Total allocated resources:	\$ 50,472,462
• LDCF (GEF):	\$ 6,850,000
• Co-financing:	
o Government parallel:	\$ 37,222,462
o UNDP parallel:	\$ 6,400,000
Total Co-financing:	\$ 43,622,462

¹ For UNDP supported GEF funded projects as this includes GEF-specific requirements

Brief Description

The impacts of climate change, particularly sea-level rise (SLR) and pronounced droughts have severe consequences on water and sanitation in the Solomon Islands. Due to SLR, low-lying islands, atolls and flat deltaic regions are faced with salt water intrusion, affecting the groundwater resources and limiting access to freshwater supply. Droughts have severely affected water supplies; during the 1997/1998 droughts that resulted in reduction of freshwater availability in Honiara by around 30-40%. Droughts have also damaged crops and livelihoods. Likewise, climate-related impacts on the quality and quantity of water has a gender dimension; in the context of the ethnic tensions, the safety and security of women and girls are compromised as they need to travel further to collect water, also leading to less time for other activities.

In this context, Government of the Solomon Islands, Ministries of Mines, Energy, and Rural Electrification (MMERE), in partnership with Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), Ministry of Health and Medical Services – Environmental Health Division, and UNDP is embarking on the Solomon Islands Water Sector Adaptation Project (SIWSAP) through support from GEF LDCF. The project objective is to improve the resilience of water resources to the impacts climate change and improve health, sanitation and quality of life, so that livelihoods can be enhanced and sustained in the targeted vulnerable areas. SIWSAP will work with partners to achieve this objective through 1) formulating, integrating, and mainstreaming water sector-climate change adaptation response plans in the water-related sectors as well as broader policy and development frameworks, 2) increasing the reliability and improving the quality of water supply in targeted areas, 3) investing in cost-effective and adaptive water management interventions and technology transfer, and 4) improving governance and knowledge management for climate change adaptation in the water sector at the local and national levels.

At the end of the four years implementation of the project, the Government of Solomon Island will have enhanced systems, tools, and knowledge for water resource resilience at the national and local levels, which will contribute to the implementation and achievement of national priorities outlined in various policies and strategies, including the National Adaptation Program of Action (NAPA) 2008, National Development Strategy (NDS) 2011 – 2020, National Water and Sanitation Sector Plan (2007).

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

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LIST OF ACRONYMS

ADRA	Adventist Development & Relief Agency
ADB	Asian Development Bank
APR/PIR	Annual Project Review/Project Implementation Reports
ALM	Asia-Pacific Adaptation Learning Network and the Adaptation Learning Mechanism
AMAT	Adaptation Monitoring Assessment Tool
AOGCMs	Atmosphere-Ocean Coupled General Circulation Models
AR4	The IPCC Fourth Assessment Report
ATLAS QPR	Quarterly Progress Report
AusAID	Australian Aid
AVI	Australia Volunteers International
BPoA+10	Mauritius Strategy for the Further Implementation of the Barbados Programme of Action
CBEWS	Community Based Early Warning System at Pilot Sites
CCA	Climate Change Adaptation
CCD	Climate Change Division
CCWG	National Climate Change Working Group
CHICHAP	Choiseul Integrated Climate Change Programme
CRISP	Community Resilience to Climate and Disaster Risk in Solomon Islands Project
CROP	Council of Regional Organisations of the Pacific
CT	Composting Toilet
CRiSTAL	Community-based Risk Screening Tool – Adaptation and Livelihoods
CBA	Cost-Benefit Analysis
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
EbA	Ecosystem-based Adaptation
ENSO	El Nino-Southern Oscillation
ERC	Evaluation Resource Center
EU	European Union
GCOS	Global Climate Observing System
GDP	Gross Domestic Product
GEF	Global Environment Facility
INaF	The Integrated National Framework for Resilient Development
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resources Management
IW:LEARN	Global Environment Facility's (GEF) International Waters Learning Exchange and Resource Network
IWCAM	Integrated Coastal Area and Watershed Management Project
IW-ECO	Global Environment Facility's (GEF) Integrating Water, Land, Resources and Ecosystems Management in Caribbean Small Island Developing States
JPfA	Joint SIDS Programme for Action on Water and Climate
KGA	Kastom Gaden Association
LDC	Least Developed Country
LDCF/SCCF-	Least Develop Country Fund /Special Climate Change Fund
LLEE	Live and Learn Environmental Education
MDGs	Millennium Development Goals
MDPAC	Ministry of Development Planning and aid Coordination
MECDM	Ministry of Environment, Climate Change, Disaster Management and Meteorology
MHMS	Ministry of Health and Medical Services
MMERE	Government of the Solomon Islands, Ministry of Mines, Energy and Rural Electrification
MMERE-WRD	Government of the Solomon Islands, Ministry of Mines, Energy and Rural Electrification - Water Resources Division
MUS	Multiple-use Water Services
NAPA	The Solomon Islands National Adaptation Programme for Action

NAP	UNCCD National Action Programme
NBSAP	National Biodiversity Strategic Action Plan
NEMS	The National Environment Management Strategy
NDMO	National Disaster Management Office
NDS	National Development Strategy
NGOs	Non Governmental Organisations
NIWCC	National Intersectoral Water Coordination Committee
O&M	Operation and maintenance
PACC	Pacific Adaptation to Climate Change Programme
PACTAM	Pacific Technical Assistance Mission
Pacific RAP	Pacific Regional Action Plan on Sustainable Water Management
PCCSP	Pacific Climate Change Science Programme
PEHD	Provincial Government Staff from Public Works, Environmental Health Divisions
PGSP	Provincial Governance Strengthening Project
PIC	Pacific Island Countries
PIFACC	Pacific Islands Framework for Action on Climate Change
PPG	Project Preparation Grant
PIC/PICTs	Pacific Islands Countries
PIF	Project Identification Form
PMU	Project Management Unit
PPCs	Pilot Project Committees
RDP	Rural Development Programme (World Bank)
RIDA	Demand and Access framework
RWSS	Rural Water Supply and Sanitation Programme
RWSSU	Rural Water Supply and Sanitation Unit
SINU	Solomon Islands National University
RTC	Rural Training Centres
SEMRICC	Strengthening Environmental Management and Reducing the Impact of Climate Change in Solomon Islands
SIDS	Small Islands Developing State
SITSAP	Solomon Islands - Tuvalu Sanitation and Adaptation Partnership
SIWSAP	Solomon Islands Water Sector Adaptation Project
SNC	Solomon Islands Second National Communication
SIMS	Solomon Islands Meteorological Services
SMS	Short Message Service
SOPAC	Pacific Islands Applied GeoScience Commission, Applied Geoscience and Technology Division of Secretariat of the Pacific Community
SPREP	South Pacific Regional Environment Programme
SPC	Secretariat of the Pacific Community
SIACWSI	Solomon Islands Access to Clean Water & Sanitation Initiative
SIDT	Solomon Islands Development Trust
SWoCK	Strogem Woka lo Community fo Kaikai Project
TB	Tuberculosis
UNDAF	United National Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollars
USD PPP	United States Dollars Purchasing Power Parity
UNCCD	The United Nations Convention to Combat Desertification
UNCDF	The United Nations Capital Development Fund
UNICEF	United Nations Children's Fund
UN	United Nations
VCA	Vulnerability Capacity Assessment
WASH	Water supply, Sanitation and Hygiene

WATSAN	Water and Sanitation
WMO	World Meteorological Organization
WRD	The Water Resource Division
WS-CCAR	Water Sector Climate Change Adaptation Response
WSG	WASH Stakeholders Group
WSP	Water Safety Plans
WRD	Water Resources Division
3WWF	3rd World Water Forum

I. SITUATIONAL ANALYSIS

1. Lying east of Papua New Guinea and northeast of Australia in the South West Pacific Ocean, between latitudes 50° and 120° south of the equator and longitude 155° and 170° east, the archipelago of Solomon Islands is comprised of about 1000 very scattered islands of diverse sizes.
2. The archipelago is comprised of the larger mountainous islands of volcanic origin rising up to 2,500 metres, as well as small low lying islands less than 3m above sea level in atoll settings, uplifted coral islands and man-made artificial islands of rock which are home to thousands of inhabitants. The island chains together measure some 1500 kilometres in total length and experience regular seismic activity. More recently in 2007, a devastating earthquake and tsunami was experienced in the western province with dozens of lives being lost and thousands being dislocated. The impact of the tsunami is still evident in the livelihoods of those who lost family and friends, and their homes and possessions.
3. The Solomon Islands have a total land area of 28,370 square kilometres and include the large high islands of Guadalcanal, Malaita, Santa Isabel, San Cristóbal, Choiseul, New Georgia, and the Santa Cruz Group with many diverse smaller islands (Figure 1). The country is divided into 9 provinces with a diverse population of approximately 549,574 (2010 estimate) speaking more than 95 languages who are almost exclusively of Melanesian decent (apart from some small communities in the northern provinces relocated from the Gilbert Islands in the 1950's). Most of the population lives in small rural communities dispersed over the nine largest islands (Solomon Islands Country Statistics, SOPAC, 2010). The capital, Honiara, is located on the island of Guadalcanal.

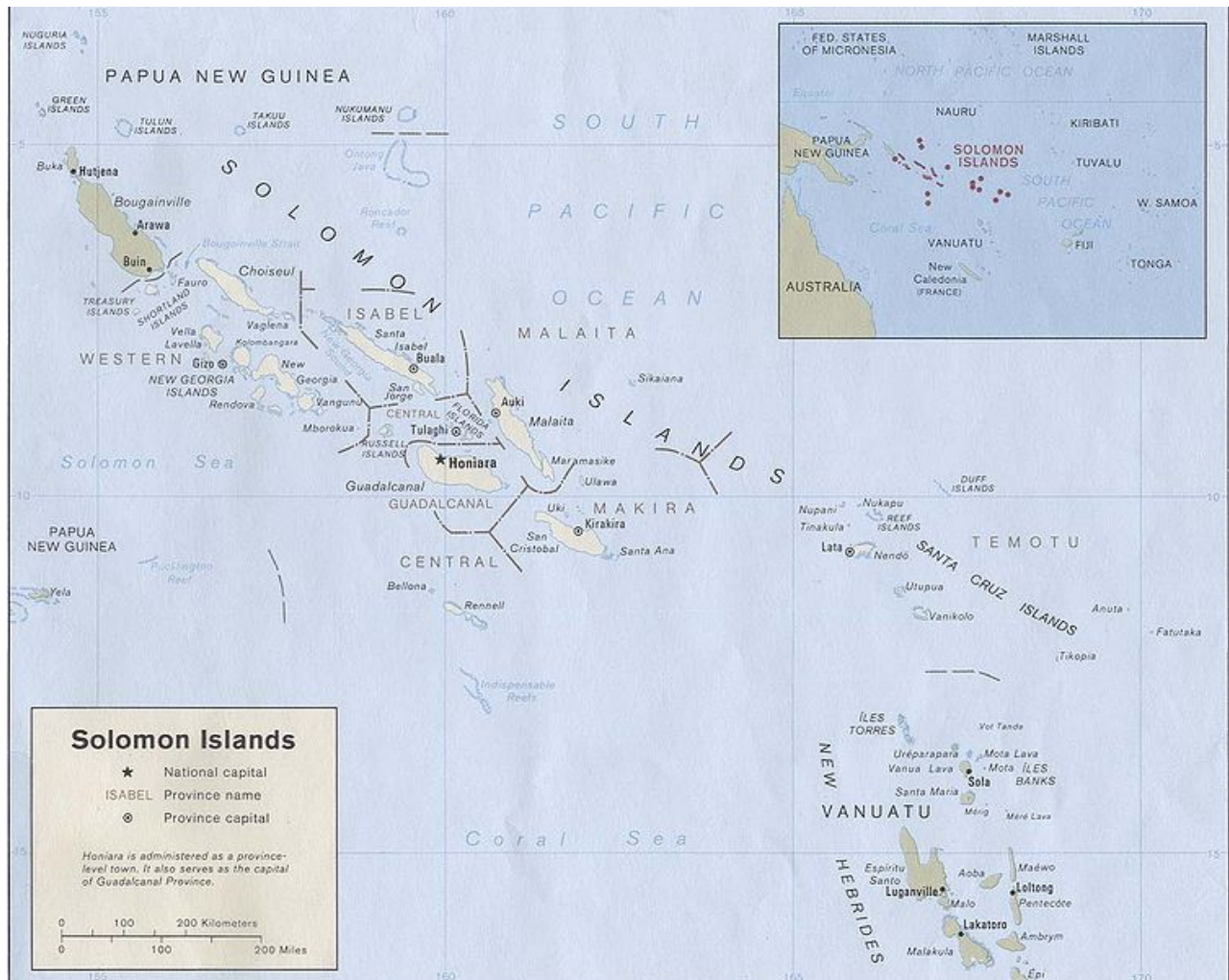


Figure 1: Map of the Solomon Islands (Source: Wikipedia)

4. The economy consists of mixed subsistence agriculture, fishing, and forestry on which over 80% of the population depend, and a small monetised sector dominated by large-scale commercial enterprises. These populations rely mainly on their traditional food production systems, traditional knowledge, strong communal systems and on agriculture, fishing and small business activities to support livelihoods. The Solomon Islands per-capita GDP of \$600 ranks it as a lesser developed nation, and more than 75% of its labour force is engaged in subsistence agriculture and fishing.
5. Key agricultural exports include cocoa, palm oil and coconut products (Solomon Islands First National Communication under the UNFCCC, 2001). Cocoa and copra production, the mainstay of rural incomes, was resilient to the negative impact of the recent ethnic crises experienced by the country. Production of these commodities continued to increase despite inadequacies of transportation and infrastructure in rural areas, and lack of access to working capital by copra and cocoa exporters and traders (National Diagnostic Report - Water Resources Management Situation in Solomon Islands, 2007).
6. Log exports and fisheries remain the major foreign exchange earner for the country, though over-reliance on single commodities magnifies the country's susceptibility to external shocks. The islands are rich in mineral resources but these are comparatively under developed apart from the Gold Ridge mine, which was reopened in early 2011 (Catalogue of Rivers for Pacific Islands).
7. Water resource management in the Solomon Islands is below regional standards, and likely to be significantly further undermined due to climate change. The Solomon Islands Water, Sanitation and Climate Outlook (Low, 2011) highlights that water and sanitation are in a state of neglect with significant gaps in governance and institutional arrangements and very limited human and financial capacity. The MDG Progress Report for Solomon Islands (2010) finds that the country is severely off-track to reach its targets for MDG 7.c. With respect to access to improved drinking water sources, the proportion of population having access has remained constant both for urban (at 94%) and rural areas (at 65%) from the 1990 baseline to the assessments in 2004 and 2010. There is also a deteriorating use of sanitation facilities during the same period for both urban areas (from 98% to 77%) and rural communities (from 18% to 7.8%). It is usually the case for small islands that poor sanitation facilities affect groundwater water quality and therefore access to improved drinking water sources.
8. The impacts of climate change, particularly sea-level rise (SLR) and pronounced droughts have severe consequences on water and sanitation in the country. The areas, which are most vulnerable to SLR are low-lying coastal areas and atoll islands. Intrusion of salt water from rise in sea level has affected groundwater resources, especially freshwater aquifers in small atolls and low-lying islands that rely on rainfall or groundwater for their freshwater supply. Droughts have severely affected water supplies; during the 1997/1998 droughts that resulted in reduction of freshwater availability in Honiara by around 30-40%. Droughts have also damaged crops and livelihoods. Likewise, climate-related impacts on the quality and quantity of water has a gender dimension; in the context of the ethnic tensions, the safety and security of women and girls are compromised as they need to travel further to collect water, also leading to less time for other activities.
9. Climate-induced impacts on the water sector in the Solomon Islands will have economy-wide implications considering the closer (statistical) links between human development and Water and Sanitation (WatSan) than many other variables, including health, education, gender equality and access to modern energy services (Human Development Report 2006). Addressing climate-related vulnerabilities in this sector will therefore have co-benefits in terms of overall quality of life and contribute to sustainable development and in turn, to improve national resilience to climate change.

1.1 Climate change - induced problem

Climate Change Context in the Solomon Islands

10. The Solomon Islands has a climate typical of many tropical areas, characterised by moderately high and uniform temperature and humidity, with abundant rainfall in all months, in most areas, especially in the mountains. The range of average maximum temperature deviation is approximately 20°C throughout the year. Rainfall is the least uniform of the climatic elements, as topographical effects cause significant variations between locations. The average annual rainfall is mostly within the range of 3,000 to 5,000 millimetres with the majority of monthly rainfall amounts in excess of 200 millimetres, with the exception of Honiara which experiences a distinct dry period from May to November. The wettest months are during the

Northwest monsoon season, with reduced rainfall during February when the equatorial trough is normally furthest south. Locations on the southern sides of the larger islands also tend to have a rainfall maximum between June and September.

11. As there are no rainfall stations at altitude (with long-term averages) the effect of increasing rainfall with height above mean sea level is unrecorded². Depending on the local topography, rainfall will increase with elevation, with maximum rainfall expected at between 600 to 1,000 metres above sea level on windward slopes. It is possible that the heaviest average yearly rainfall could reach up to 9,000mm at some elevated sites. The extreme falls seem to be confined to the transition months of December and April when the equatorial trough is migrating across the islands. The islands, because of their proximity to the equator, are less subject to the damaging effects of tropical cyclones than elsewhere in the southwest Pacific, though cyclones still pose a serious threat each year. Additionally, due to the low latitudes of the Solomon's, atmospheric pressure has only a small variation from month to month, recording little change from day to day except when a tropical cyclone is in the area (SOPAC, 2012).
12. A robust assessment of potential climate changes in Solomon Islands has recently been undertaken through the Pacific Climate Change Science Programme (PCCSP)³, led by the Australian Government in collaboration with the regional meteorological services including the Solomon Islands Meteorological Service. This study has analysed up to 24 different global models of future climate based on three IPCC scenarios: Low (B1), Medium (A1B) and High (A2). The scenarios are linked to trends in global greenhouse gas emissions and potential global mitigation actions. The following is a summary of the projected changes over the course of the 21st century as in the "*Climate Change in the Pacific: Scientific Assessment and New Research | Volume 2: Country Reports | Chapter 13: Solomon Islands*":
 - Surface air and sea surface temperature are projected to continue to increase (very high confidence);
 - Annual and seasonal mean rainfall is projected to increase (high confidence);
 - The intensity and frequency of days of extreme heat are projected to increase (very high confidence);
 - The intensity and frequency of days of extreme rainfall are projected to increase (high confidence);
 - The incidence of drought is projected to decrease (moderate confidence);
 - Tropical cyclone numbers are projected to decline in the south-west Pacific Ocean basin (0–40°S, 130°E–170°E) (moderate confidence);
 - Ocean acidification is projected to continue (very high confidence). Mean sea-level rise is projected to continue (very high confidence).
13. These projections do not represent a value specific to any actual location, such as a town or atoll in the Solomon Islands – this level of downscaling is yet to occur. Instead, they refer to an average change over the broad geographic region encompassing the Solomon Islands and the surrounding ocean. With good reason, there are currently no projected climate change scenarios downscaled to the national or island level for the country. The IPCC Fourth Assessment Report (AR4) is limited in its projected climate change scenarios for the Melanesian region as AOGCMs⁴ do not have adequate resolution. The complex topography of Melanesia which the Solomon Islands is part of is a further complicating factor in climate change scenario generation and analysis.
14. Figure 2 shows the projected changes in the annual and seasonal mean climate for the Solomon Islands, under the B1 (low; blue), A1B (medium; green), and A2 (high; purple) emissions scenarios. These projections represent three 20-year periods centred on 2030 (2020-2039), 2055 (2045-2065), and 2090 (2080-2099), relative to 1990 (1980-1999). Values represent approximately 95% the range of model predictions (apart from sea-level rise where the mean and the 5 to 95% range are both given taken directly from the IPCC 4th Assessment Report).
15. The manifestation of climatic extreme events and the consequential damage has already been felt. For example, Cyclone Namu which struck in 1986 destroyed the rice industry resulting in heavy reliance on imports, increasing poverty and slowing a number of development indicators. Over 130 people were killed, 90,000 lost their homes (one third of the population at that time) and property and infrastructure damages cost more than USD 25 million. In 2003 the category five cyclone Zoe with maximum wind speeds of 285 km/hour hit the small outer island of Tikopia. This was the most intense cyclone ever recorded in the

² Although some work has been done on rainfall intensity with elevation for Guadalcanal. See ADB (2011). Guidelines for climate proofing investment in the transport sector: road infrastructure projects. Manila. Asian Development Bank.

³ Included as Annex 1.

⁴ Atmosphere-Ocean Coupled General Circulation Models.

Pacific. These types of events are increasingly becoming the annual norm, and are indicative of the damages and therefore costs likely to be caused by increasing climate variability and extremes. Without the introduction of sufficient measures to support the Solomon Islands to adapt to a range of climate contingencies, the scale of damages will be larger, and the toll of opportunities lost will unfortunately be longer-lasting.

Variable	Season	2030	2055	2090	Confidence
Surface air temperature (°C)	Annual	+0.6 ± 0.4	+1.1 ± 0.4	+1.5 ± 0.6	High
		+0.8 ± 0.4	+1.4 ± 0.5	+2.3 ± 0.8	
		+0.7 ± 0.3	+1.4 ± 0.4	+2.7 ± 0.6	
Maximum temperature (°C)	1-in-20-year event	N/A	+1.0 ± 0.5	+1.3 ± 0.6	Low
			+1.4 ± 0.6	+2.1 ± 1.0	
			+1.5 ± 0.4	+2.7 ± 1.2	
Minimum temperature (°C)	1-in-20-year event	N/A	+1.2 ± 1.8	+1.7 ± 1.6	Low
			+1.5 ± 1.9	+2.2 ± 1.9	
			+1.6 ± 1.7	+2.5 ± 1.8	
Total rainfall (%)*	Annual	+1 ± 9	+4 ± 8	+6 ± 9	Moderate
		+2 ± 9	+5 ± 10	+9 ± 11	
		+2 ± 6	+4 ± 9	+9 ± 12	
Wet season rainfall (%)*	November-April	+2 ± 9	+5 ± 8	+6 ± 7	Moderate
		+2 ± 9	+6 ± 11	+9 ± 11	
		+2 ± 7	+4 ± 7	+9 ± 11	
Dry season rainfall (%)*	May-October	0 ± 11	+3 ± 11	+6 ± 14	Moderate
		+2 ± 13	+4 ± 12	+9 ± 16	
		+2 ± 9	+5 ± 15	+10 ± 18	
Sea-surface temperature (°C)	Annual	+0.6 ± 0.4	+0.9 ± 0.3	+1.3 ± 0.5	High
		+0.7 ± 0.3	+1.2 ± 0.3	+2.0 ± 0.6	
		+0.7 ± 0.4	+1.3 ± 0.5	+2.5 ± 0.6	
Aragonite saturation state (Ωar)	Annual maximum	+3.6 ± 0.1	+3.3 ± 0.1	+3.1 ± 0.1	Moderate
		+3.5 ± 0.1	+3.1 ± 0.1	+2.7 ± 0.2	
		+3.5 ± 0.1	+3.1 ± 0.1	+2.5 ± 0.1	
Mean sea level (cm)	Annual	+9 (4–14)	+18 (10–26)	+31 (17–45)	Moderate
		+9 (5–14)	+19 (8–30)	+38 (19–58)	
		+9 (4–15)	+19 (8–30)	+40 (20–60)	

Figure 2: Project Changes in the Annual and Seasonal Mean Climate for the Solomon Islands

(Source: Australian Bureau of Meteorology and CSIRO, 2011. Climate Change in the Pacific: Scientific Assessment and New Research, Vol.2)

16. Over the past few years flooding, king tides, excessive rainfall and storm surges have rendered rural locations and communities officially 'disaster areas'. The frequency of calls for disaster relief assistance from the national government is reaching levels never before experienced in the country since it attained political independence in 1978. A typical example is the flooding incident that occurred on west Guadalcanal in early 2010 that devastated several villages, killing 9 people. The rainfall recorded for Honiara weather station within 12 hours during the night of the flooding was the highest daily rainfall ever recorded for Honiara in its 30 years record (standing at 251.8mm).
17. According to recent models and predictions on sea temperature increases, the Melanesian sub-region may be the most affected area in the Pacific with potentially significant losses in marine biodiversity due to likely

future occurrences of coral bleaching (Coles, 2008). Studies on the effects of climate change on disease incidence in the Pacific have predicted that cases of malaria and dengue are expected to increase significantly in the coming years in Fiji, PNG, Vanuatu, and the Solomon Islands (Potter, S. 2008). This is already being observed in the Solomon Islands by use of the SCOPIC software that has modelled the strong correlation between high rainfall and high incidences of malaria.

18. It is clear that water resource management in the Solomon Islands requires significant improvement, and the current management and wider water governance structures are likely to be undermined significantly due to climate change. The Solomon Islands Water, Sanitation and Climate Outlook (Low, 2011) provides scale resolution to the problems, highlighting that water and sanitation are in a state of neglect with significant gaps in governance and institutional arrangements and very limited human and financial capacity. The MDG Progress Report for Solomon Islands (2010) finds that the country is severely off-track to reach its targets for MDG 7.c. With respect to access to improved drinking water sources, the proportion of population having access has remained constant both for urban (at 94%) and rural areas (at 65%) from the 1990 baseline to the assessments in 2004 and 2010. On the other hand, there has been a deteriorating use of sanitation facilities during the same period for both urban areas (from 98% to 77%) and rural communities (from 18% to a possible 7.8%). It is usually the case for small islands that poor sanitation facilities affect groundwater water quality and therefore access to improved drinking water sources.
19. Present scenarios for Solomon Islands suggest little change in future annual mean rainfall and thus imply that climate change would have minimal effect on water resources. However, in the past, events such as El Nino have had significant impacts on water sources in some parts of the country. The worst was during the 1997/98 El Nino phase where many areas of South Guadalcanal, Malaita and Western Province, including Gizo Town (the second largest urban area in the country) suffered water crises. Thus, any decrease in average future rainfall or increase in drought frequency or length will adversely affect water supply in such areas, including for human consumption and health, sanitation, and food production.
20. The region highly vulnerable to general climate factors such as the El Nino-Southern Oscillation (ENSO) event. This affects the inter-annual climate variability in the Solomon Islands, causing distinct oceanographic, temperature, rainfall and cyclonic conditions (Figure 3). Two known phases of ENSO are El Nino and La Nina. During the El Nino phase, ocean surface waters are warmer than normal and the equatorial divergence is located well to the east of the Pacific. By contrast, during a La Nina phase, the temperatures are cooler and equatorial divergence occurs across much of the region. Cyclones and high rainfall events are associated with the La Nina periods. Although the El Nino and La Nina cycles can be considered natural climate variability, it is not well known as to how ENSO will change under future climate change.
21. It has been predicted that LDC's such as Solomon Islands will be amongst the most vulnerable countries to the impacts of climate change and that the costs of addressing climate change may be as high as 5% of GDP (Stern Report, 2006). Efforts to begin addressing climate change are already impacting on the limited capacity of the country. This places extra load on limited human and technical resources. The Solomon Islands Government will simply not be able to deploy more resources to provinces and rural locations given the very limited growth, if any, in allocation to government ministries and subventions to the provincial governments.

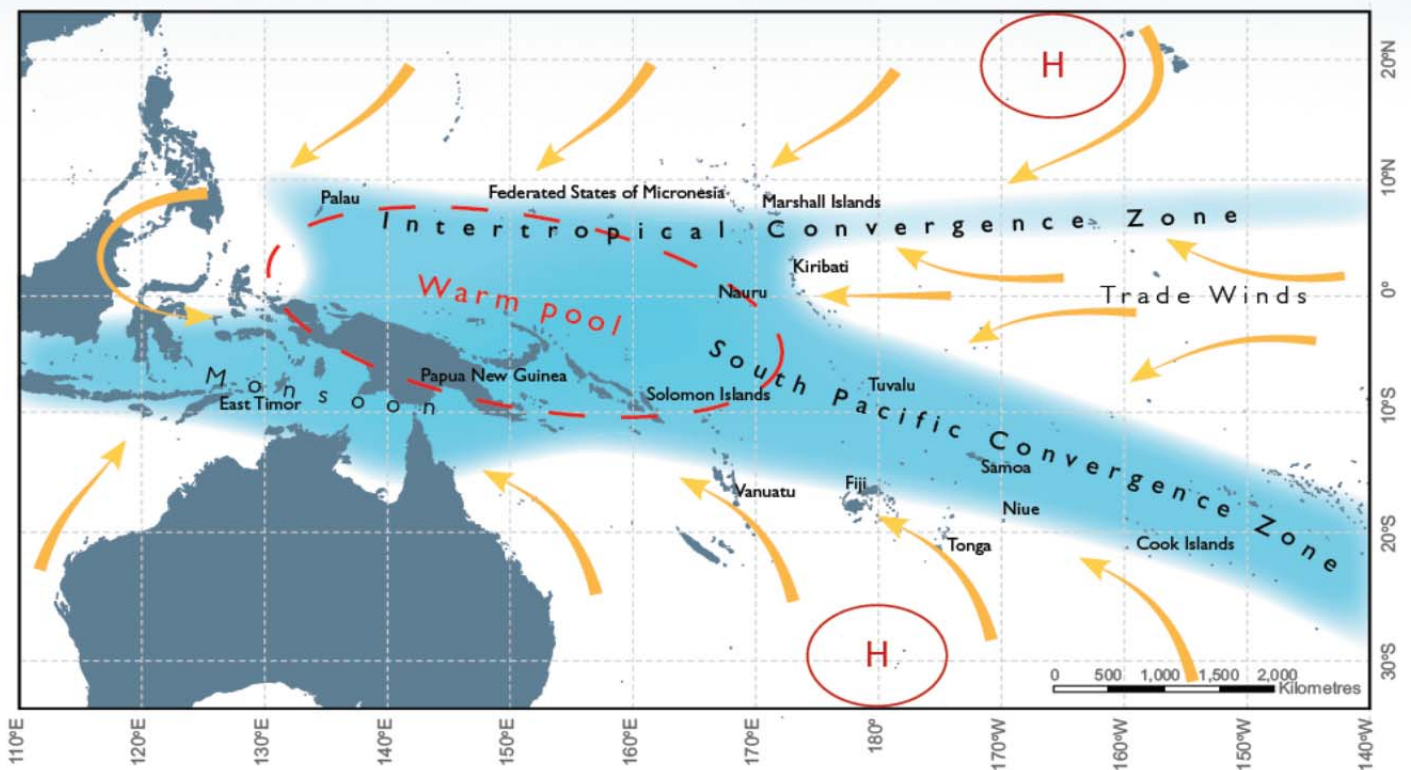


Figure 3: The average annual positions of the major climate features November to April
 (Source: PCCSP Project, 2011)

Climate change induced problems on Water Resources and Ecosystems

22. The RIDA (Resources, Infrastructure, Demand and Access) approach (Moriarty et al., 2004) is a conceptual framework that examines the linkages between demand, access, infrastructure and resources to examine the root cause of problems related to water access lie, and identify potential solutions. Utilizing this framework, both direct and indirect problems induced by climate change on the water sector in the Solomon Islands are analyzed in this section.
23. The examination of the water resources and ecosystems in the Solomon Islands through the RIDA approach points to the following key findings in regard to the nexus of climate change and water issues in the Solomon Islands:
 - Climate change has the potential to impact to all the components of a water supply system (resources, infrastructure, demand and access) and these potential impacts can be varied in nature;
 - Some potential impacts are likely to be direct (e.g. increased incidence of extreme floods that damage WASH infrastructure as already experienced in the Solomon Islands), whereas others are likely to be indirect and more uncertain in the nature and severity of impacts (e.g. sea level rise leading to migration away from coastal areas, or salinization of shallow groundwater);
 - Given the range and uncertainty of climate impacts, developing a stand-alone climate change adaptation and/or mitigation interventions in the water sector may not be cost-efficient or strategic. Instead, the effective way forward will be to develop improved water governance systems that ensure that adaptation strategies are based on a solid understanding of the impacts of climate change on the different components of individual WASH services delivery systems.
24. Summary of the RIDA analysis is presented in below Table 1.

Table 1: Impacts of Climate Change on Water Resources and Ecosystems

Impacts on 'Infrastructure'	
Direct	Indirect
<ul style="list-style-type: none"> • Rainfall increases and decreases in the same years • Increased precipitation intensity and variability increases the risks of flooding and drought in many areas. • Higher water temperatures affect water quality and exacerbate many forms of existing water pollution. • Sea level rises contributes to saline intrusion into shallow coastal aquifers, particularly atolls • An increase in temperature for the Solomon Islands, affecting evaporation and transpiration rates from ecosystems. This may impact groundwater availability and surface flows. 	<ul style="list-style-type: none"> • Land use change, agricultural intensification particularly deforestation leads to changes in hydrology at local island scales. • In areas of lower rainfall, water quality of rivers and groundwater decreases as a result of reduced dilution of pollutants, especially in townships and peri-urban areas. • Risk increases unsustainable use of surface and groundwater resources (already demonstrated in the Solomon's through unsustainable groundwater pumping rates contributing to salinization of shallow groundwater). • Warmer and damper conditions increase the incidence of many water-borne diseases (as discussed above in narrative).
Direct	Indirect
<ul style="list-style-type: none"> • Investments are needed to protect villages, communities and townships from flooding. • Investments are needed to increase the capacity of water storage, supply and treatment systems where necessary across the country. • Major investments are needed to supply WASH services to people in general, as highlighted in the new rural WASH policy (draft). • Destruction of WASH infrastructure and contamination of groundwater occur as a result of localized flooding – is key learning from the World Bank supported rural Development Programme. 	<ul style="list-style-type: none"> • Conflicts over access to water and land use (especially for land needed as watershed areas, or for groundwater storage) • High levels of expenditure on WASH services are not accompanied by training and capacity development to maintain systems, or for financial accountability of WASH services investments. This has historically been a common problem in the Solomon's.
Impacts on the Demand for Water	
Direct	Indirect
<ul style="list-style-type: none"> • Contribution of increased demand for safe water results from prolonged drought, increasing temperatures etc. • Demand increases for Multiple-use Water Services (MUS) activities using water from WASH developed small-scale infrastructure and ecosystem services e.g. deforestation leading to use of land for livestock and diffuse pollution of water resources – breakdown of traditional water sources and governance of land and water systems. • Food security concerns, mining and hydropower development may lead to competition between water for ecosystems, services, and other economic needs – as climate change will impact the availability of water and the timing of that availability. 	<ul style="list-style-type: none"> • Interest increases in all types of demand management, regulatory instruments etc, and access and equity issues over water services, with an increasing push for individual families to provide water services domestically. • Increased demand and pollution concerns due to changes in precipitation patterns leads to increased concerns over maintenance of ecological flows and protection of rare habitats. • Increased demand leads to increased challenges of water treatment and sewage sludge disposal in areas with septic tank systems. Where water flows are reduced due to climate change, there are concerns over pollution dissipation in surface waters from humans and animals (pigs) – a common problem across the Pacific.
Impacts on Water Access	
Direct	Indirect
<ul style="list-style-type: none"> • Increasing challenge of ensuring access to WASH services is consistent with established norms during periods of drought. • WASH service provision to poorer social groups, especially in areas affected by flooding or sea-level rise is a major challenge where behaviours do not maintain existing systems • Allocation of water for aquatic ecosystems and 	<ul style="list-style-type: none"> • Many kinds of livelihood problems result from rapid climatic change to which adaptation may be difficult or even impossible • Possible increased risk of capture of water resources by elite social groups • There is a possibility failure on the part of regulatory systems and/or legislation aimed at protecting rights of individuals or community to access water for

Table 1: Impacts of Climate Change on Water Resources and Ecosystems

maintenance of important habitat and watersheds is less than required to service the coastal populations – especially for growing townships.

different uses.

- Although national level policies are developed, application at the Provincial level is weak due to limited resources and capacities, high costs, and lack of information on water flow, quality, precipitation, and pollution concerns.

1.2 Underlying causes

25. The impacts of the climate change projections presented above will interact with the underlying causes of the problem, which are inherently climate and non-climate related. These causes presented below, inherently interconnected with one another, and in combination provide significant development challenges for the Solomon Islands. The analysis presented below follows an analytical framework developed by UNDP – “Designing Climate Change Adaptation Initiatives (2010)”.
26. These underlying causes can be largely classified into three interrelated categories: (i) agriculture dependence; (ii) geographical and socio-political characteristics (the remoteness of most human settlements in the Solomon Islands as a whole – and particularly its outer islands); and (iii) the extreme physical exposure and sensitivity of the population of the Solomon Islands, especially in terms of access to safe and reliable water and sanitation and the impact unreliable sources have on human health; and finally (iv) vulnerability of water resources and services. Each of these four categories is described in turn below.

Agriculture Dependence

27. The Solomon Islands is an agriculturally based society. Agriculture commodities have been the major exports from the Solomon Islands since the country attained its independence. In 2003 the agriculture sector contributed a GDP value of SI\$39.3 million or 14.5% to the economy and a sectoral growth of 24.2%. Agriculture will continue to form the basis of the economy. A survey conducted in the 1970s identified 338,100 hectares or 12% of the total land area as having the potential for agriculture development, but only 21,500 ha or 6.4% have been presently developed based on the Ministry of Agriculture and Livestock records.
28. The agriculture sub-sector comprises three distinctive components; (i) the small holder subsistence sector, (ii) small holder cash agriculture and the (iii) commercial sector which was greatly affected by ethnic unrest recently experienced in the country. While in the context of the agriculture sector the household unit is the predominant economic or production unit whereby individuals or families operate from. A vast majority of Solomon Islanders are engaged in agriculture activities. The census of 1999 shows 111,905 people participating in some kind of unpaid activity; 78.3% engaged in agriculture activities while fishing accounted for 5.3%. The agriculture industry is the largest single employment sector in the country with 20.6% or 11,859 paid workers employed in the agriculture sector (SIG 1999).
29. Past assessments of a number of vulnerable areas in the country reveal how agricultural practices that rural populations rely on, including associated business activities, are being placed under increasing pressure from a growing population and emerging climate change hazards and risks. The Solomon Islands’ NAPA outlines the effects of climate change on a number of sectors, most notably agriculture. The implications of changes in long-term temperature and rainfall patterns, as well as the changing frequency of incidences of extreme weather (such as tropical cyclones) are expected to have long-term effects on food production systems, thereby undermining development and economic growth activities. The traditional practice of shifting cultivation that allowed for regeneration through fallowing for extended periods is no longer possible in most areas due to increasing population pressure on land and there is mounting evidence, supported by a number of assessments and surveys that the fast growing population of rural families and communities are struggling to cope with the effects of changing weather patterns. (Source: National Agriculture and Livestock Sector Policy 2009-2014). Increasing intensity of rainfall disrupting planting times and lowering crop yields and loss of soil fertility due to leaching, soil erosion and on-going cultivation is impacting productivity per unit area (Kastom Gaden survey of South Guadalcanal 2006).
30. The informal agriculture smallholder sector has always been the foundation of food security in Solomon Islands. With a heavy reliance on ecosystem services such as soil conditions, water resources and forests

this system has provided food and shelter for most of the national population and has been the main safety net during difficult times such as the ethnic unrest during 1999-2003 when law and order broke down and the main formal economic activities in the country came to a grinding halt. Extrapolating from the work carried out by Bourke (2004) on calorific values and amounts of root crops consumed by people in neighbouring Papua New Guinea a local firm has estimated that the production of root crops in Solomon Islands, using the national population and the equivalent calorific values, quantities and price for imported rice, is a conservative 1.189 billion Solomon Dollars (USD 148,625 million) per annum (Solomon Islands State of Environment Report, 2008). Disturbances to the smallholder system by unsustainable land use practices and climate change will reduce the capacity of this system to feed the country and will place significant cost burdens on the government to invest in the agricultural sector, or seek alternative solutions to this problem.

Geographical and socio-political characteristics

31. Some sectors are more sensitive to the impacts of climate change and sea level rise and are regarded as having high exposure risks due to a number of dimensions which are mainly determined by the geographical and the socio-economic and political context of the country. Some locations and islands are located at areas that are not geographically protected hence their high vulnerability to the adverse effects of natural activities such as king tides and high swells. This level of exposure also impacts on the status of soil fertility and land use not only in the low lying atolls (salinisation of the soil and shallow freshwater lenses) but also in some of the coastal communities on the larger islands. The pressure from a rapidly increasing population exacerbates the situation as speed of resource exploitation and land use increases. In rural areas, especially remote islands such as Ontong Java, access to basic services such as health and medical services, water and sanitation, education, telecommunication, technology and transportation is difficult. Lack of access increases the degree of vulnerability and sensitivity (Vulnerability and Adaptation Assessment Report for Low-Lying Atolls – Ontong Java, 2011).
32. The economy of Solomon Islands, like its geography, is also fragmented. Economic growth remained strong in 2012, driven by growing mining activities. Further moderation in growth is expected over the next 2 years as forestry resources dwindle (ADB, date). Of the total land area, 77% comprises non commercial forest and cleared land, 13% is unlogged commercial natural forest and 10% logged over natural forests. Much of the forested areas are on slopes greater than 30 degrees and above the 400 meter contour. Log exports have been the main source of government revenue over the past years rising to as much as 60% of total national income. Unfortunately, this has been at a serious cost to the environment with a lot of land area now compacted and difficult for use and re-growth by pioneer forest species and for cultivation by local communities.
33. The national population is also growing at an annual rate of 2.8% making it one of the highest in the world (SIG Population Report, 2000). At this rate the population will double around 2025 placing extreme pressures on national resources and budgets, with the economic growth rate currently below the population growth rate. Approximately 41% of the total population is under the age of 14 years, indicating a very high youth dependency ratio. The rate of population growth over the past 20 years now places the country in a situation where this rate is now higher than the economic growth rate, causing serious concern about the future country capacity to cater for the increasing population.
34. About 85% of the population live in rural villages comprising approximately 65,000 households averaging six people (SIG Population Report, 2000). In 2008 the country had an overall HDI value (2012) of .530 and a GDP per capita (USD PPP) of \$2,301 (UNDP, 2008). The agricultural sector absorbs 75% of the labour force and accounts for 42% of GDP. The majority of rural dwellers reside on hilly and mountainous areas or along very low lying coastal areas. Both locations are highly exposed to abnormal and extreme weather. Strong communal systems define organization and management regimes for land and other resources, including livelihood systems in agriculture, fishing and small business ventures.
35. Above all, in many occasions it is the lack of capacity of government and partners to assist when required the most that intensifies the sensitivity and vulnerability of many of the economic sectors. When the State is incapacitated to intervene, communities and populations are left exposed to the insecurities brought about by the impacts of climate change and sea level rise (Vulnerability and Adaptation Assessment Report for Low-Lying Atolls – Ontong Java, 2011).

36. For example, there are no clear-cut regulations applicable to the protection and management of watersheds. In the Solomon Islands the responsibility for water resources is shared amongst three organisations: the Ministry of Mines and Energy with provision to provide national coverage on water resource assessment, management and development of groundwater, the Solomon Islands Water Authority for provision of safe water and wastewater services to urban populations, and the Ministry of Health and Medical Services, Environmental Health Division for provision of safe water and sanitation for rural populations.

Physical exposure and sensitivity

37. Water resources availability ranges from sizeable rivers to small streams, from high mountainous and dense rainforest islands to rainwater harvesting and thin freshwater lens of underground aquifers of the small low-lying atolls and islets. Mountainous islands have fragile and small watersheds dissected by rivers and streams while low lying atolls and islets depend on rainfall and aquifers as the main sources of water. On the bigger and higher islands the quality of water is deteriorating as a result of logging, mining and slash and burn agriculture while pollution and salt water inundation are the biggest threats to water quality and availability on low lying islands. Bigger islands have low coastal areas that are already experiencing inundation and loss of coastal vegetation. Much of the country has abundant though very fragile water resources.

38. There is an increasing demand for water which requires proper management and development. The demand relates to both quality and quantity. In urban areas population has drastically increased over the years with limited expansion in the water supply sector. Similarly, rural populations have experienced deterioration in freshwater quality due to land-use changes (logging and agricultural practices). Urgent and decisive action must begin now to address water resource management issues in the country. Evidence exists that the quality and quantity of fresh water is reducing; although the rate of reduction is not very well understood because of inadequate hydrological data and limited knowledge of local hydrology and water resources.

39. Although most parts of the Solomon Islands enjoy high average rainfall this does not mean that water resources can be taken for granted. Rainfall and river flows are highly variable in certain areas; drinking water supplies may be short at some stage, yet a few months' later roads and gardens may be threatened by floods. There are particular problems in the outlying atolls, where there are only limited supplies of groundwater. Even where water resources are abundant they may not be suitable for a particular use, such as human consumption (National Diagnostic Report - Water Resources Management Situation in Solomon Islands, 2007). In addition, cyclones, flooding and drought periodically affect the country. Sea level rise also poses a threat to the smaller low lying islands, and the quality of any shallow freshwater lenses.

40. The soils of the Solomon Islands make up one of the country's most important resources, although they are also very fragile and require careful management and protection. A nation-wide reconnaissance level assessment of soil types in 1976 (Hansell and Wall 1976) classified soil types and found that most have good structure but are generally deficient in potassium which is needed for production of root crops. Soils on sloping land are very prone to leaching and erosion and are vulnerable to rapid degradation if located in areas of high rainfall and high population density (Pacific Horizon, 2009). The National Disaster Management Office (NDMO) has had to respond to emergency food deficit situations where communities in the windward side of the main islands cannot produce sweet potato (*Ipomea batatas*) due to abnormally prolonged periods of high rainfall causing excessive vegetative growth and very minimal tuber formation.

41. Unsustainable land management through poorly designed and uncontrolled and unsustainable timber extraction methods, intensive agriculture on converted forest land and the extension of subsistence farming as a result of increasing population all place extreme pressures on the land and soil resources. Most of the accessible soils have fertility and/or micronutrient deficiencies and increased exposure results in soil leaching and erosion. Quantitative data on the soil erosion rate and extent of land degradation are limited and to date there is no systematic and planned approach to investigating and documenting alternative sustainable cropping and agriculture land use systems in the country. However, soil erosion and increased sediment load in rivers can be attributed to human activities such as large scale clearing from mining and logging activities, as well as impacts from traditional subsistence slash and burn agriculture, increasing urban development and residential housing (Catalogue of Rivers for Pacific Islands).

42. Direct impacts on people include health problems induced by increasing incidences of salt water intrusion which affects groundwater wells for drinking water supply. When there is a drought period people resort to shallow wells for drinking water in the absence of other sources such as green coconuts. The incidence of diarrhea is exacerbated by the contamination of wells (Vulnerability and Adaptation Assessment Report for Low-Lying Atolls – Ontong Java, 2011). Potential pollution and contamination of water resources have been identified from untreated domestic sewage, small industry discharges (e.g. fish processing), hydrocarbons from oil storage tanks, mine drainage and leaching discharges from mine waste, and residues of agricultural fertilizers and pesticides. The extent of this contamination is currently not well understood due to a lack of recent data (Catalogue of Rivers for Pacific Islands).
43. Coverage of rural water supply and sanitation is poor across the Solomon Islands. This has been mainly due to delays in projects, damage to infrastructure during the tensions between 2003 and 2008, and a growing population. The majority of the 300 registered health facilities and approximately 1,000 schools across the country do not have sufficient sanitation facilities. Nationwide, 71% of households do not have improved sanitation facilities, and nearly 30% do not have access to safe water. The reality is that at the rural level, where 80% of the population lives, it is practical to assume that only 10% have access to improved sanitation facilities, and only 65% of households having access to water supply⁵.
44. The impacts of water borne diseases and hygiene related illnesses are a leading cause of infant mortality, child mortality, and post natal complications and maternal mortality. Lack of water and sanitation in schools contributes to early dropout rates for girls (79% of boys to girls in secondary school). Equally, it is anticipated that the projected increases in temperature will increase the incidence of malaria in areas already affected. Furthermore, it is likely that mountain areas of islands like Guadalcanal and Makira where malaria incidence is known to be relatively low would likely experience an increase in incidence. Higher temperatures may also favour an increase in incidence of the more dangerous falciparum malaria. Clearly, climate change is going to affect the quality and availability of freshwater, and the knock-on effects of this on human health are multiple, from vector borne diseases to possible increases in cholera and diarrhoeal disease.
45. The pollution of drinking water and the resulting health hazards may be one of the biggest watershed issues in the Pacific Island countries. The main source of drinking water in the Solomon Islands comes from surface water in the form of streams, springs or rivers. Some small atoll islands collect rainwater for drinking and utilise brackish water from shallow hand dug wells for most of their other domestic needs. Some communities on the higher volcanic islands also use groundwater for domestic purposes. The major users of groundwater resources are Honiara city and the Guadalcanal Plain area. The Guadalcanal Plains on the northeast coast of Guadalcanal have abundant potential for groundwater use. However, with increasing agricultural developments in the area there is an urgent need for proper planning and management of the resources and their sustainable use.
46. As far as the diet of the people is concerned, much of the food intake is energy foods and protein foods. Protective foods are almost absent. According to household surveys there are incidences of high blood pressure, diabetes, diarrhoea, TB, and yaws. Protective foods are not grown in the islands because of poor soil conditions. However, this is attributed by land degradation caused by salt water intrusion in the garden areas as a result of sea level rise on atoll islands only (Vulnerability and Adaptation Assessment Report for Low-Lying Atolls – Ontong Java, 2011). In reality, some of this may also be due to poor groundwater management, where shallow freshwater lenses are used to the point where replenishment of freshwater (linked to rainfall and soil material conductivity) cannot keep up with extraction rates. This combination of overuse or unmanaged extraction, combined with changes in precipitation needs to be taken into account in trying to develop more robust groundwater management practices for communities reliant on groundwater for at least some of their livelihood needs.

1.3 Long-term solution and barriers to achieving the solution

Long-term solution

47. The National Development Strategy (NDS) is the national planning framework for Solomon Islands for 2011-2020. The strategy highlights, under Theme 7 'Creating and Maintaining an Enabling Environment', the following two objectives related to building resilience to climate change impacts:

1. Effectively respond to climate change and manage the environment and risks of natural disasters
2. Improve governance and order at national, provincial and community levels and strengthen links as all levels.

This project will support the development of sector plans and policies, as mandated under the NDS, by 1) mainstreaming adaptation in broader development frameworks, and 2) building water resource resilience. Long-term solutions for each approach are elaborated below.

Mainstreaming adaptation in broader development frameworks

48. Combined with the Solomon Islands National Climate Change Policy, the NAPA, the Pacific Regional Action Plan on Sustainable Water and Wastewater Management, and the Pacific Islands Climate Change Framework 2006-2015, these policy frameworks and objectives firmly support both the improvement in identifying climate change impacts, but also how to better adapt to them through improving resilience to, focusing on water resources, water supply, sanitation and hygiene.
49. The Integrated National Framework for Resilient Development (INaF)⁶ proposes the integration of disaster risk management and climate change adaptation to sustainably address both challenges. The INaF identifies the need for systemic changes in the way risk is identified to strengthen national resilience, articulating the need to focus on what works already and to focus on strengthening existing structures and systems and institutional relationships, and to only develop new ones where the demonstrated need arises. This is important for small countries where transaction costs are high, and where change can often move key personnel out of 'active' implementation roles for long periods of time. Solutions do therefore exist at the national level but the implementation of cross-sectoral approaches requires improved coordination between agencies, and particularly at the Provincial level through targeted support and capacity development.
50. Mainstreaming and integration in turn requires that island communities and government staff are exposed to various adaptation options that are available in the region or globally, including livelihood resilience building measures, engineering measures to protect physical assets, and behavioral changes that are required to accommodate the climate-induced changes in the surrounding physical and environmental settings. As a small island developing state, which comprises of many small outer islands, a certain level of physical exposure to extreme weather events is unavoidable. In light of this, the only pathway to a sustainable, climate-resilient Solomon Islands is to increase the preparedness of Solomon Islands, especially in outer islands, to such events. The most fundamental prerequisite to enhanced preparedness is access to information and awareness. Outer island communities need to be provided with timely and accurate information of imminent hydro-meteorological risks. Once such information is received, all community members need to react appropriately based on the nature of the information, e.g., no fishing activity, stay indoors, evacuate to designated evacuation site, etc. Greater access to existing information, and the need to interpret climate related risks to Provincial, and to individual islands, and then community levels is a key solution to help communities build resilience at scales that affect them.
51. It is proposed that the new INaF framework for mainstreaming disaster risk management and climate change into development should strengthen existing development processes by providing a resilience focus. The aim is to have in place a framework which gives guidance to the different ministries in their work. Rather than looking into how other Government agencies can support the implementation of the work plan of the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), the framework will look at how MECDM can better support other Ministries to do their work in a way that supports greater resilience.
52. By 2013 Pacific Island Countries will have raised the baseline in managing and coping with water resources management, pollution and environmental stress and climate vulnerability. This will lead to a more sustainable use of water resources, a reduction in water related health problems, supporting watershed protection, improving biodiversity, and reducing land degradation. PICs have already identified the priority needs for the region through the Pacific RAP (Annex 4), allowing national governments and donors to focus investments on priority concerns and to highlight capacity development needs. For adaptation activities there is a need to move beyond business-as-usual in sectoral silos and integrate

⁶ Establishing an 'Integrated National Framework for Resilient Development' (INaF), Draft Concept Note, 2013.

climate change information and understanding into water resource planning and management across sectors.

53. IWRM is a valuable framework to build climate resilience. It is a useful entry point for capacity development, helping to foster inter-disciplinary skills through utilizing local knowledge and integrating this into monitoring to ensure that cause and effect are understood by all stakeholders. The Pacific IWRM Programme has moved the wider Pacific Island Countries far in this respect, yet there is an urgent need to move the Pacific forward in this respect – and IWRM offers a long term solution this – through integration of sectoral understanding, marrying water supply and sanitation with wider water resources management and source protection, and focusing on improving the governance of water management through the development of Committees to exchange information, the development of frameworks and plans for improved water resource management, improving legislation and policy. IWRM provides a wide ranging set of tools as solutions, such as payment protection schemes for water source protection, rehabilitation and land restoration approaches to preserve fresh and groundwater systems, and at the same time bring wider ecosystem and biodiversity benefits.
54. PICs recognize the need to integrate disaster risk management (DRM), climate change policies and natural resource management strategies to increase the resilience of societies and communities to hazards by reducing risk and improving the ability to better anticipate, resist and recover from the impacts of disasters. The underlying causes of climate and disaster risk in PICs are not only linked to exogenous factors, but determined to a large extent by home grown development decisions on public investments and land-use planning. It also includes similar traditional development instruments such as public investment planning and social protection, which need to be used in innovative ways to address existing vulnerabilities and upscale disaster risk management efforts.

Solutions for building water sector resilience to climate change

55. Water, sanitation and hygiene have been focused on target delivery, the number of ‘people served’ for many years. In doing so, the roll-out approach often focuses on short term immediate concerns and impact, but not on medium to longer term challenges⁷⁸. Clearly, a first step is for the WASH sector to engage more effectively with climate change researchers and in relevant national research and data collection activities. The benefits of this approach are twofold: (i) firstly, this will ensure that discussions on the potential impacts of climate change on the WASH sector avoid the shortcoming of considering these impacts in isolation of all the other challenges currently facing the sector. National statistics are low for rural WASH services, but in part this is connected to investment failures of the past where inadequate attention was paid to operation and maintenance responsibilities, community capacity developing and financing; and (ii) this will also ensure that development of new recommendations for the rural WASH sector draws upon lessons (both positive and negative) learnt through past and ongoing attempts to meet existing WASH challenges. This will increase the likelihood that investments in WASH will be more successful through both reducing the risk of mistakes being repeated, but also through taking a more medium to longer term perspective on the resilience of water systems and services to climate change impacts.
56. Adaptation options proposed more specifically fall into the category of best practices and ‘no regret’. The upgrading and integration of watershed and coastal areas management is flagged as top adaptation priority, and is a key element to supporting the application of wider social services such as water supply and sanitation provision. From this perspective, solutions this project will implement include:
- the strengthening of hydrological services in their capacity to develop and apply responsive water monitoring and forecasting systems;
 - the development of a risk-based adaptation response process for water supply and sanitation services in rural locations (although this will be tailored for the sites with townships);

⁷http://www.worldwatercouncil.org/fileadmin/world_water_council/documents_old/Library/Publications_and_reports/Climate_Change/PersPap_14._WASH_Services_Delivery.pdf

⁸http://www.worldwatercouncil.org/fileadmin/world_water_council/documents_old/Library/Publications_and_reports/Towards_a_Framework_for_Climate-Proofing.pdf

- the mainstreaming of climate information and knowledge, and a greater connection with disaster risk reduction strategies will be linked to the national water and sanitation agenda, and IWRM approach the government is applying;
 - increasing resilience-building investment through enhanced political awareness, advocacy, capacity development and a national platform to share, analyze lessons, and learn throughout the project cycle.
57. Review of climate change literature also suggests that there is a two step approach to integrating adaptation approaches with the water sector. The majority of the proposed solutions to climate change focus on improving failing water governance approaches, and building the resilience of the wider water system through diversity of sources, improved storage and management, wise-use approaches, etc. This project will implement actions, which provide these solutions.
58. The potential impacts of climate change may require an increased emphasis on certain actions or interventions to the disaster risk management agencies, such as improved coordination greater sharing of resources and information, better emergency preparedness and response, and greater mobilization of funding during drought periods. Equally, other governance interventions will include improving building regulations to ensure rainwater harvesting is adequately considered, and the potential is there for new buildings to include tanks, rather than put additional strain on other community and public water services where they exist. Planning also needs to improve to ensure water infrastructure is not placed in areas of flood risk, and at the community level this requires working with the traditional governance structures to build their capacity on these issues of siting of WASH services.
59. Solutions to develop innovative approaches for the water sector to deal with climate change impacts therefore will focus on:
- improving WASH governance so that they are better able to take account of the increased uncertainty that can be attributed to climate change. Also governance systems are required that explicitly match actions and interventions to specific contexts and take explicit account of potential externalities – and not get caught in the cycle of planning (Outcomes 1 and 4);
 - adopting and implementing IWRM so that there is better alignment of approaches across the water resources and WASH ‘divide’ and to other sectors and planning, including specifically to other sectors and processes that have an influence on water supply and demand for WASH services (Outcomes 2 and 3);
 - through adopting principles of adaptive management. Adaptive management is based on the recognition that in a complex and rapidly changing situation there can never be sufficient information to reach a settled ‘optimum’ decision. Hence, the WASH sector should put effort into planning approaches that are and supported by strong monitoring and information management systems, which allow for constant adaptation and the upgrading of plans and activities – the revised Rural WASH policy (draft, June 2013) will reform the way the MHMS-ERD will do business going forward (Outcome 1, 2, and 3); and
 - a strong focus on strengthening capacity within the WASH and water resources sector, meteorological services, planning, Provincial Government, and disaster risk sectors, particularly at the intermediate and local levels (all Outcomes).

Barriers to achieving the solution

Awareness about climate risks and response measures in the water sector

60. At present there is limited understanding of the economic and public health importance of safe water at the political level, except during extreme periods such as droughts and flooding when disaster responses are mobilised. As water is critically important to every sector, no one agency or sector has responsibility, the issue has no political champion, and the issue does not get the political support, be it budgetary, institutional or as a priority that it requires. Similarly, whilst the public generally understands the value of water to their daily lives, it is either assumed to be always available or given insufficient priority over other issues (e.g. health, education, income), despite being implicitly important to achieving these more valued family goals. The understanding of water collection, storage, treatment (as necessary), and availability is not well understood within communities.

61. With only 37% effective coverage of rural water supply and sanitation, and real figures expected to be much less as reported by AusAID in their Audit and Capacity Assessment⁹, the capacity of government, working together with partners plays an important role in providing rural water supply, sanitation and hygiene (WASH) services. Despite this, there is a serious gap in providing services to people, at the pace required given population growth, and the catalytic effects of climate change. Climate change impacts are already occurring on water resource availability, affecting the intensity of rainfall, and thereby affecting the practical ability to capture water, and to store it safely for human consumption. Equally, rainfall intensity often leads to flash flooding, especially on islands with short rivers and streams and high-sided valley and steep slopes. Rapid flooding can occur which can destroy existing WASH infrastructure, and mobilize pollution, including of fragile groundwater that many rely on in coastal communities and atoll environments.
62. With these challenges it is also clear that the link between climate change and water services is not well understood. Driven by targets and indicators, water supply and sanitation approaches are focused on more immediate concerns – relief ‘in-action’ on a daily basis to provide basic services to people. Unfortunately, the supporting capacities required around infrastructure and the physical works has suffered from poor investment. Community engagement, operation and maintenance training, sourcing of parts, training in repair works, collecting finance for repairs maintaining small funds and re-investing in systems where they require expansion or modification has not occurred at the scale required.
63. The National Rural Water Supply, Sanitation and Hygiene Policy (v.11, July, 2013, draft), clearly articulates that the high failure rate of water supply systems (estimates of only 35-40% of systems working). This high failure rate is attributed to lack of resources for maintenance, but also agencies involved often do not have the capacities (and resources) to work with communities on awareness raising, and to work on developing approaches to ‘hand over’ systems both technically, for maintenance and repair needs, and financially, in order to establish a funding system to keep systems working. Unfortunately, training with communities on these issues has not historically been provided. For sanitation, there is a serious lack of understanding around the importance of sanitation and improved hygiene practices. The poor status of understanding sanitation is further compounded by the historical promotion of inappropriate technologies, poor designs, and systems with high maintenance and financial requirements.
64. Consequently providing rural WASH services is already difficult. Logistical and communication challenges in a region with scattered islands and frequent storms and poor weather make access to sites difficult. This was experienced during the PPG. Combine this challenge of providing services with a disconnect between water resource management, and water services provision and the impact of changes in the hydrology due to climate change add further stresses to the water system. The Water Resource Division (WRD) in the Ministry of Mines and Rural Electrification was historically established to provide water assessments for the development of small scale hydropower. Capacity has consistently expanded within the WRD with a far wider understanding of water resource management, but the resources, and influence they have to better manage water across the country, and especially at the Provincial level remains low.
65. Furthermore, the National Water and Sanitation Sector Plan (draft June 2013) highlights how, through integrated water resource management, adaptation approaches can be implemented and strengthened. The Plan makes use of a recent report that highlights¹⁰ climate and non-climate risks to 2020. Certain high ‘risks’ were common across countries. These included the challenges with providing clean water supply and sanitation services to a region with an increasing population, where demands for water are predicted to increase between 70-240%, especially in urban and growth town areas. Leakage of water – water use efficiency concerns and system management, together with pollution of water sources including groundwater are considered high risk. Further high risks included salinization of groundwater, poor water governance, capacity and resource limitations, and the lack of engagement with communities.
66. These high risks are ‘vulnerabilities’ to national and also regional development. This highlights that one of the major challenge is improvement in water governance, and engagement, especially to localize, mobilize, and invest in capacity development. Getting water management improved now – will not only lead to

⁹ Joint Audit and Capacity Assessment of Solomon Islands Access to Clean Water & Sanitation Initiative: Final Report. February 2013. AusAID, Health Resource Facility.

¹⁰ Falkland, A. Report on water Security and Vulnerability to Climate change and Other Impacts in Pacific Island Countries and East Timor. For the Pacific Adaptation Strategy Assistance Program, Department of Climate change and Energy efficiency, GHD Pty, Ltd. August, 2011.

greater economic opportunities and therefore growth and better human health, but also better 'readiness' and preparation for the impacts of climate change to impact on water resource availability and quality.

67. Yet clearly, education, awareness and capacity building are essential components of minimizing risks and vulnerabilities and adapting to climate change. Capacity building actions can take place at the systemic (enabling environment), institutional and individual levels and should have the ownership of target beneficiaries to ensure effective implementation of adaptation and mitigation actions. The rural WASH sector has never before considered the climate change implication on the water services investments they provide, and therefore how this will affect, short to medium term the longevity of the systems they provide with partners to communities. Increasing populations reliant on a few water points, combined with precipitation changes is likely to put additional stress of rural WASH provision. Accelerating rural WASH investments now urgently need to consider climate change impacts on their interventions, to avoid further investment providing reduce results by 2020.
68. Equally, Disaster Risk Reduction (DRR) strategies and actions contribute to reducing vulnerability. A nation, community or system is likely to be less vulnerable and more adaptive if it reduces its risks to disasters such as extreme events. On the other hand, the greater the risk from disasters the greater the vulnerability. The close relationship between the DRR and climate change adaptation agendas requires good coordination and integration to minimize duplication and maximize synergies. Solomon Islanders have coped with climate variability and extreme events historically. Traditional knowledge developed and refined over the years has been a feature of Solomon Islanders resilience and coping capacity but is now eroding due to increasing reliance on an inadequate network and range of modern technology and practices. Reviving and promoting traditional coping strategies and technologies is an essential part of adaptation. The importance of mainstreaming disaster risk management and climate change into development still remains to be a challenge.

Limited infrastructure for timely and accurate dissemination of imminent hydro-meteorological risks

69. Systematic observation refers to having a systematic approach to measuring and analysing changes in weather, climate, water cycles, biological systems and ocean systems. The capacities of national agencies and partners need to be strengthened in the Solomon Islands to systematically observe changes in weather, hydrological and ocean systems over time and to use information and technology now available. This is required to more accurately predict, and therefore plan risk reduction and adaptation actions. The scattered geography and weather systems experienced by the Solomon Islands affects both the ability to accurately record rainfall and other climate variables, but also to communicate them in different ways. There is a lack of telemetry data recording across the country. Analysis of information and other variables requires an increase in capacity – limited in part by the number of scientifically qualified people coming into the sector. Furthermore, communicating this information, in a way that is relevant to all sectors, and taking this information out of the capital and across Provinces for sharing and communicating with people affected does not happen. Land tenure issues related to access to sites, installation, maintenance and protection of equipment is also a problem, limiting the ability to establish a broader network of monitoring sites.
70. Although the Solomon Islands Government has been cooperating in the Global Climate Observing System (GCOS), programs of the World Meteorological Organization (WMO) and other agencies' participating in WMO's climate agenda, there is a need to invest in equipment and capacity activities to help build data collection and analysis for the country. Equally, there is a real opportunity to develop an approach to capture the traditional and anecdotal experiences and information present in communities who often explain historical trends and changes through stories and through community discussion.
71. Pacific Islands Countries suffer from a lack of water resources expertise and baseline knowledge, key basics for water management. This is classed as being a fundamental barrier to any informed decision-making on water resources management and protection, including for integrated water resource management (IWRM). However, there is progress in some community led approaches. Box 1 describes work in Choiseul Province which illustrates the unique connection communities have with the ecosystems they rely upon – the 'natural infrastructure' of water provision, and the more immediate effects that can be seen on small islands from poor land use and water management practices. These effects are more quickly felt by communities, through food supply and quality, to human health. Capacity to cope is most limited, and consequently sensitivity highest, where livelihoods and the economy are based on a narrow

range of assets that are easily damaged by climate hazards, with few alternate options or means of managing risk. This ‘lack of diversity’ maybe due to historical climate, practices and beliefs. But the shifting climate will impact this historical narrowing of options into livelihoods approaches that may not be able to cope with the future climate scenarios.

BOX 1: Lessons from Ecosystem-based Adaptation (EbA) in Choiseul Province

Choiseul contains globally significant natural resources. These are essential in supporting the economies, lives and livelihoods of the people. Ecosystem based adaptation aims to maintain these resources and keep ecosystems healthy to meet the primary goal of reducing vulnerability. Landslide risk can be reduced by keeping intact forest on steep slopes. Mangroves and coastal vegetation can be replanted for coastal protection. These activities also then provide firewood, fish habitat, building materials and food for local communities. Previous studies found that households in the village of Nukiki in Choiseul benefit to the value of SBD\$49,533 every year from forest products. This value comes from building materials, firewood, medicine, nuts, fruit and food from the forest that are used by families, but not actually sold.

Specific adaptation options identified by the communities in Choiseul for the protection of water resources, inter tidal and coastal areas as well as for increasing food security and livelihoods management include: a) protection and/or restoration of water catchment areas, riparian and freshwater ecosystem management, increasing water storage capacity, sediment control of freshwater streams and water quality testing; b) planting coastal trees/shrubs for protection, mangrove reforestation, creating vegetation buffers on river banks and maintaining existing ecosystem functions; and ; c) technical agricultural assistance (crop rotation, crop diversity, agricultural techniques), agroforestry of cash crops and fruit trees, reforestation of previously logged areas with valuable timber species, contour planting and terracing and improved pest and disease control.

Most communities in Choiseul are located in narrow low-lying coastal areas, which are often bordered on the landward side by creeks, swamps and hills, and bisected or adjacent to rivers and streams. The terrestrial, freshwater and marine ecosystems they depend on are therefore closely linked by the relatively small catchment areas that connect the mountains, coastline and reefs. Ridge to reef planning integrates multiple sectors including agriculture, environment, forestry and fisheries in order to protect community livelihoods. Since communities are the resource owners, a ridge to reef approach must focus on the community as the central point for adaptation action.

Tribal leaders of Choiseul have already decided to work towards a network of protected areas by agreeing to the Ridge to Reef Protected Area Network plan. Protected areas on land, on the coastline and in the sea ensure that intact catchments provide a clean water supply, the sea continues to provide a reliable source of fish and decrease the risk of damage from natural disasters. (Source: Lacovino, Carlo, et. al. 2013. Ecosystem-based adaptation and climate change vulnerability for Choiseul Province, Solomon Islands – a synthesis report– Apia, Samoa)

Capacity for climate-resilient planning, budgeting and monitoring both at local and national levels

72. Climate change will affect all development sectors of the country. This requires an effective institutional arrangement and enabling environment in place to address it as an integrated and cross-cutting development issue. The enabling environment is slowly developing through policy reform and development, and changes to how institutions will work in the future, such as the rural WASH work through the MHMS-EHD. However, the integration of climate change information, and understanding this through interpretation of the impacts on different sectors for improved planning, and especially budgeting is low. For rural WASH, this has not occurred. For water resources, although understanding regarding the potential impacts of climate change are known, lack of data and capacity limits the application of knowledge.
73. As water is critically important to every sector, no one agency or sector has responsibility; the issue has no political champion. Similarly, whilst the public generally understands the value of water to their daily lives, it is either assumed to be always available or given insufficient priority over other issues (e.g. health,

education, income), despite being implicitly important to achieving these more valued family goals, and underpinning to the Millennium Development Goals broader than Goal 7 alone¹¹.

74. The capacities of Provincial Administrations are also limited in understanding the impacts of climate change due to lack of information, and also to objectively look at more medium to longer term planning for water resource protection for the provision of WASH services long term. The lack of information, downscaled to a Provincial level, limits the claims about the impact of climate change – as people are more concerned with immediate stresses. Influencing Provincial Plans will be key to embed a greater understanding of the vulnerabilities of water resources and services (water supply and sanitation, interventions requiring institutional support) to climate change impacts, and the knock on effects this could have on Provincial Health Services and the ability to respond to disasters and other shocks, including slow onset events such as droughts.
75. In conjunction with this, although on paper the Climate Change Policy and NAPA provide a solid framework for the Government to mobilize resources, the capacity to implement adaptation approaches remains weak. The integration of climate change into wider development planning, and to build resilience in the water sector is understood at some levels, but the practical implementation of this through line ministries is limited. Development partners, focused on providing WASH services have also not paid adequate attention to climate change impacts. The World Bank Rural Development Programme has rehabilitated water supply scheme, which have been repeatedly damaged due to flooding in coastal areas, both freshwater and storm surge causing pollution of the system with saline water.
76. Consequently, with limited analysis, partly due to lack of data, regarding the impacts of climate change, investment in rural WASH services will remain limited in their lifetime without a change in the practice of providing these services. The business-as-usual scenario needs to change regarding potable water provision, and the protection of watersheds and conservation of limited freshwater groundwater is urgently required. The restoration and protection of watersheds is expected to contribute to these objectives by conserving soil moisture, preventing erosion, reducing runoff and through the reduction of variability in supply during dry and longer term drought periods. In some cases, restoration activities may need to take place in the watershed to channel and conserve water in depressions as recharge zones.
77. Integrated Water Resource Management (IWRM) as an overarching national governance approach to water has not been widely used in the Solomon Islands until recently. Investment in IWRM through both demonstration activities on the ground, and the development of new policy framework has made significant gains. However, despite making advances in the water sector generally¹², there are still challenges to implementation of IWRM – as there are globally. One challenge is the different situations faced within each Province regarding land access, openness, main to outer island perspectives, capacity limitations outside the capital, and indeed policy relevance and the ability to implement outside the capital and the main island of Guadalcanal. IWRM and adaptation initiatives need to work at local (community) and Provincial to address some of the main challenges faced by the majority of the population.
78. A lack of sufficient drinking water quality monitoring often fails to ensure these problems are resolved quickly. Water treatment plants, where they exist, are often unable to cope with the demand due to poor infrastructure, lack of financial and human resources, and expanding population pressure. There is also a lack of water resources expertise and baseline knowledge – this lack of baseline information is a fundamental barrier to any informed decision-making on water resources management and protection, and limits the ability to strategically plan for water supply and sanitation needs, including risk reduction on water systems, both built and natural. Without this information and capacity, adaptation is difficult. Improved capacity is required to implement and sustain integration and coordination between sectors and this role is often an additional part of existing staff workloads.
79. Based on nationally identified needs for improved water resources management, building on consultations and actions evident in the country, and national commitments to climate change adaptation and improved water resource management through IWRM, this project is designed to support the Solomon Islands in both removing the barriers which limit the country from integrating water resources, water supply, sanitation and hygiene, with adaptation understanding and planning. It will also help understand disaster risk

¹¹ MDG 7: Ensure Environmental Sustainability.

¹² Carpenter, C., and Jones, P. 2004. *An Overview of Integrated Water Resource Management in Pacific Island Countries: A National and Regional Assessment*. Status Report for GWP – Integrated Water Resource Management (IWRM). SOPAC Miscellaneous Report 554.

concerns and look at ways to better support national policy implementation on disaster risk reduction through water and adaptation response. The key strategy for doing this is IWRM¹³.

80. The size of the country, the complex spread of the islands and the logistical costs, and windows of opportunity to reach some islands, prevents 'economies of scale' being available, as they are in larger countries. The costs of operating water service providers, a regulator, an environmental health department or a water resources agency, are higher per capita, thus resulting in limited human and financial resources available to fulfill these functions. Insufficient cost-recovery mechanisms due to cultural, political or technical reasons, by water and wastewater service providers contributes to under staffing, inadequate maintenance levels and ensuing water losses, water and wastewater treatment failures and pollution. Often at community levels, no support or service provision exists for water supply. For sanitation, there is none outside of some towns.
81. As part of the project design activities the baseline for the Solomon Islands on water has been established based on material from the Pacific IWRM Programme. The baseline, using an earlier national Country Diagnostic Analysis for the Solomon Islands identifies that:
1. Often there are limited and/or fragile water resources available, and that these may be susceptible to over-exploitation and pollution. At certain 'scales' within the country there is often little technical management capacity to exploit and protect water resources or to work at different spatial management levels; there is also often high vulnerability to climate variability resulting in rapid onset of flooding and droughts and follow on effects (threats to public health, damage to infrastructure, reduction in quality of existing fragile water resources);
 2. Insufficient political and public awareness of the critical role of water in supporting economic development, public health and environmental protection, and the lack of support in rural locations for community/village water supply and especially sanitation facilities. Recent policy commitments and action are changing this however;
 3. Excessive urban water demand due to high water losses and poor water conservation, combined with inadequate drinking water treatment due to limited technical resources;
 4. Inadequate wastewater management resulting in widespread freshwater and coastal water pollution due to minimal reliance upon on-site septic tanks, poorly maintained septic tanks, lack of septage emptying and treatment options, very limited sewerage systems, and in rural areas the widespread continued practice of open defecation.
 5. Conflicts between national versus traditional rights, especially balancing the needs of land and water resources planning with customary land ownership;
 6. Inadequate financing of water and sanitation provision due to poor cost-recovery but also a lack of 'economies of scale' for funding resources, health and environmental protection; partly due to a limited tax base, and,
 7. Weak linkages to other stakeholders both within the water sector but particularly to other economic sectors, public health and the environment – across the island landscape. However, despite fragmented national water governance approaches due to little formal communication and coordination between government departments, this situation is rapidly changing with new policy development, project resources and an overall improvement in capacities. However, this change pathway needs to be maintained. Nationally there are not enough key institutions who can fulfil both the role of implementer, and broker between different sectoral beliefs and needs.
82. The lack of disaggregated data on issues relating to climate change and disaster risk management undermines the ability to address the impact on the poor, especially women, youth and children. Capacity development is needed to better equip key development sectors with the awareness and skills to identify and prepare for the harmful consequences of climate change, including slow onset and more immediate disasters. This also includes the ability to incorporate climate and natural hazard information into decision making, especially for rural communities and at the Provincial town level.

¹³ The multiple nature of water resources and their uses needs to be reflected in a move away from traditional sector approaches to what has become known as integrated water resources management. At its most complex level IWRM involves cohesive decision-making concerning the development and management of water resources for various uses, with all decisions made and agreed upon by relevant stakeholders.

1.4 Stakeholder Baseline Analysis

83. The focus of the baseline analysis during the PPG phase was to capture enough information regarding ongoing and planned projects in the water resources, WASH, and climate change areas to better understand the project and programme landscape. Pilot site missions also allowed for not only the identification of possible investment sites based on a vulnerability assessment, but to also understand the perceptions and understanding of climate change in the communities and agencies concerned. Care was taken to manage project expectations, both in terms of 'when' project interventions may take place, and 'how' they would be delivered in detail. This was to avoid adding the expectation of project responsibility and delivery on communities and agencies. During the inception phase of full project implementation the proposed pilot site designs would need to be reviewed more closely with the communities and agencies concerned to ensure that project delivery and expectations are well managed.
84. Extensive consultation took place between April and October 2013. The PIF provided the framework for these consultations, and assumptions were checked, verified, or adjusted based on consultations during this period. The PPG Team was led by an International Project Development Specialist, and consisted of local experts in water supply and sanitation, institutional development and social issues, and climate change¹⁴. The PPG Team visited all the sites proposed under Outcome 2 of the project, and the Project Development Specialist visit the Gizo and Malaita site with the rest of the team. The aim of the PPG phase was to, (i) deliver preliminary technical assessments on the sites, (ii) conduct stakeholder dialogue and capacity assessments as far as was possible, as the specific pilot site and Provincial levels; and, (iii) to develop the required reporting on the sites and other national level issues concerning adaptation and water necessary to design the project. The PPG process was led by the Water Resources Division of the Ministry of Mines, Energy, and Rural Electrification (MMERE-WRD), together with counterpart organizations the Rural Water Supply and Sanitation programme (RWSS) within the Ministry of Health and Medical Services (MHMS) and the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM).
85. The methodology adopted during the PPG phase was:
- Hosting a national Inception Workshop to start the PPG phase held in Honiara 16-17 April 2013. This meeting was attended by different stakeholder agencies¹⁵.
 - Numerous bilateral consultations in May with stakeholders from national government agencies, NGO's, development partners, target group beneficiaries, local experts, regional CROP agencies, other donor project staff. These consultations were held during country visits in April and May, and then with ongoing consultation via phone and email through June to August (specifically with CROP agencies and AusAID).
 - Consultations during the pilot site visits by the PPG Team (eight sites in total were visited across six Provinces). Sites visited represented a total population of 11,100 people, representing 52% men and 48% women, 20% of which were youths or children. Discussions were held with Provincial Government during the site visits, and survey were conducted by the PPG Team to better understand the water supply and sanitation requirements of people and their perceptions of climate change and the impacts they had experienced.
 - A PPG validation workshop on 24 October in Honiara to present the proposed design of the project to stakeholders¹⁶. The project governance structure was presented and discussed, as well as pilot site selection, the implementation model using SIWSAP Provincial Officers, the structure of the Project Management Unit, suggestions for capacity development needs, and discussion concerning project risks and logistical challenges that needed to be considered for full project implementation.
86. Combined, these consultations, together with background material collection and review, discussions with donors and government, provide the foundations for assessing the current situation regarding water resources and WASH, and the vulnerability of these to sustain livelihoods and economic growth needs due to climate change. The pilot site reports produced also provide a valuable snapshot of the situation at each location and can therefore be considered a useful baseline for the sites, and a valid monitoring tool therefore during full project implementation.

¹⁴ Additional support provided by the USAID funded ADAPT Asia-Pacific programme.

¹⁵ Recorded in the Inception Report from the Meeting.

¹⁶ A brief report of this meeting is available for the project record.

87. In December 2012, an AusAID funded independent audit and institutional capacity assessment was conducted to review existing implementation modalities and to identify constraints in the rural water supply and sanitation sector. The assessment helped the Ministry of Health and Medical Services (MHMS) to scope out its capacity development strategy – a strategy aimed at changing the function of MHMS in delivering these services, and with the clear objective of scaling up service delivery across the now defined area of water, sanitation and hygiene (WASH) service areas. This assessment led to the development of a Transition Plan to assist the Solomon Islands Government in mobilizing their reform of the rural water supply, sanitation and hygiene vision – to help address the lack of progress in rolling out national water supply and sanitation services. The Transition Plan outlines the actions stakeholders will take to mobilize and transform the delivery of rural WASH services. In part this is also due to an expected tripling of donor funds for rural WASH, mainly from the EU and AusAID (approximately US\$37m). The Transition Plan describes how the existing organizations will absorb this funding and mobilize to improve the rural WASH situation.
88. The implications of this transition on SIWSAP are; (i) the opportunity to influence large scale rural WASH mobilization with adaptation designs and learning to improve the resilience of interventions, (ii) the possible co-finance support, and technical learning that can take place between the MHMS-EHD, and other partners involved in SIWSAP; and (iii) the complexity, and therefore risks to be managed with large scale funding arriving at a time when it is desperately needed, but when the institutions and agencies responsible to deliver the services are going through reform, as describe by the rural WASH Policy (draft, June, 2013).
89. During the PPG phase, specific discussions were had with a range of locally based organizations to describe the project to them, and to identify possible roles in supporting full implementation. Further information regarding the institutional and current project and programme baselines and engagement possibilities for SIWSAP are described in Section 2.8, and appropriately included in the Project Objective, Outcomes and Outputs section.

II. STRATEGY

2.1 Country Ownership: Country Eligibility and Country Drivenness

90. The proposed project is consistent with national strategies and plans in the Solomon Islands, and is aligned with LDCF/SCCF focal area objectives 1, 2, and 3. The project will assess vulnerabilities of the water sector, and through this build adaptation approaches for the water sector to improve the resilience of the country to water related shocks and climate change impact trends. As part of the Solomon Island Governments commitments to the UNFCCC a National Adaptation Programme of Action was completed in 2009 with the water sector included as one of the priority vulnerability and adaptation issues.
91. The focus of the project on improving the resilience of water resources impacts of climate change is within the priorities of the LDCF programming strategy which recognizes the special challenges in the water sector in the context of climate change. More specifically, it is stated in the strategy that *'the linked impacts of climate change pose very complex adaptation challenges that are additional to the existing policy and management failures facing (amongst others),...water supply, irrigation, ... and wider water resources management, including commonly ignored areas of groundwater and coast'*. Climate-related stresses exacerbate long standing pressures on water resources but need to be jointly addressed if drinking water supplies and food from irrigation are to be sustained. In fragile SIDS, the improved management of water resources, and adoption of no regrets approaches into water management practices at the local level will also contribute to achieving other MDGs such as reducing poverty, eradicating hunger, ensuring environmental sustainability.

COUNTRY ELIGIBILITY

92. The Solomon Islands is a Non-Annex 1 Party, as well as a Small Islands Developing State (SIDS) grouped under the Least Developed Country (LDC) category. The Government of the Solomon Islands ratified the United Framework Convention on Climate Change (UNFCCC) on 28 December 1994. In September 2004 the Government submitted its Initial National Communication to the UNFCCC. The country is now finalising its Second National Communication to report on greenhouse gas emissions, mitigation measures, vulnerability status and options for adaptation and capacity development. This second communication highlights the vulnerability of water resources and their potential for renewable energy as well as the range of technology needs and technology transfer opportunities for adaptation and mitigation in the water sector.
93. The SIWSAP project is aligned with the Climate Change Focal Area of the GEF. The project is aligned with the Least Developed Countries Fund/Special Climate Change Fund focal area objective 1 (GEF/LDCF.SCCF.9/4/Rev.1) – to 'reduce vulnerability to the adverse impacts of climate change, including variability at local, national regional and global level', objective 2 – to 'increase adaptive capacity to respond to the impacts of CC, including variability', and objective 3 – to 'promote transfer and adoption of adaptation technology'.
94. The project will start with the assessment of vulnerabilities in the water sector which will provide the context for Water Sector Climate Change Adaptation Response (WS-CCAR) plans. The WS-CCAR plans will be formulated within an integrated water resource management approach, based on the principles of IWRM, and will be mainstreamed in broader development frameworks, particularly at the relevant Provincial unit of the project sites and appropriately up-scaled to the national level.

COUNTRY DRIVENNESS

95. The project is compatible with the National Development Strategy (see paragraph 115), and the NAPA, and as a catalyst is supported by a new Water and Sanitation Sector Policy and Implementation Plan, and a new rural WASH policy. The National Climate Change Policy was approved in 2012 – to 2017. The project will be situated within the Ministry of Mines, Energy, and Rural Electrification (MMERE), and specifically the Water Resources Division (WRD). The Project Board also contains the Ministry of Environment, Climate Change and Disaster Management Meteorology, the lead agency for climate change and disaster risk management in the country.
96. The project will work with lead national agencies and Provincial Government across six Provinces to identify specific vulnerabilities to the water 'system' at six specific sites, and then development adaptation response plans for those sites, followed by investment into improving the resilience of the water supply

systems, both natural and built options. The implementation of the adaptation response, specifically through investments and improved provision and access to clean drinking water and sanitation, better water management practices and institutions, and improved integrated disaster response measures to extreme climate events. New technologies to improve community-level water sector resilience in the context of climate change will be employed and transferred to the beneficiaries and the private sector, as appropriate to facilitate replication. The sites where the project will work have been selected in a transparent process. These sites will provide learning opportunities at the Provincial to National level, and from these strategic investment options will be considered at other locations identified through improved vulnerability identification and consultation.

97. This project proposal is compatible with the following International and Regional Multilateral Agreements to which the Solomon Islands is a signatory:
- 1) UN Framework Convention on Climate Change (1992);
 - 2) Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972) [London Dumping Convention];
 - 3) Convention on Biological Diversity;
 - 4) Convention for the Protection of Natural Resources and Environment of the South Pacific Region (1986) and related Protocols [SPREP Convention], and
 - 5) The United Nations Convention to Combat Desertification (UNCCD)
 - 6) Pacific Regional Action Plan on Sustainable Water Management (Pacific RAP)

2.2 Project Rationale and Policy Conformity

98. The National Development Strategy for 2011-2020 highlights, under Theme 7 'Creating and Maintaining an Enabling Environment', the following two objectives:
1. Effectively respond to climate change and manage the environment and risks of natural disasters
 2. Improve governance and order at national, provincial and community levels and strengthen links as all levels.
99. Climate change will be a major impediment to the achievement of sustainable development in small islands, as all economic and social sectors are likely to be adversely affected, and the cost of adaptation will be disproportionately high relative to GDP. In attempting to mainstream adaptation strategies into their sustainable development agendas, small islands will be confronted by many challenges including insufficient resources, equity considerations, prioritization of adaptation measures and uncertainties over climate change projections and the most appropriate and 'no regret' adaptation strategies (Pacific Adaptation to Climate Change: Solomon Islands – Report of In-Country Consultations).
100. The first formal description of the Solomon Islands national vulnerabilities to climate change was presented in the country's Initial National Communication to the UNFCCC in 2004. The report recognized the limited understanding on the vulnerability of the country to climate change and sea level rise and the need to put in place 'suitable plans, policies and measures'. Initial priority vulnerable areas identified included; 1) Subsistence and commercial agriculture, 2) **Human health**, 4) Coastal environments and systems, 4) **Water resources**, 5) Marine resources.
101. In 2008 the Solomon Islands started the development of a National Adaptation Program of Action (NAPA) with funding assistance from the GEF and UNDP. The NAPA presents the Solomon Islands immediate and urgent national priority adaptation needs based on a rapid Vulnerability and Adaptation assessment in selected parts of the country. The NAPA describes and prioritizes the country's vulnerable sectors together with potential project profiles. Further information is provided in Box 3. Combined with the regional Pacific Islands Climate Change Framework 2006-2015, these policy frameworks and objectives firmly support both the improvement in identifying climate change impacts, but also how to better adapt to them through improving resilience to, focusing on water resources, water supply, sanitation and hygiene.
102. As part of the national commitment to the UNFCCC the NAPA was completed in 2009. Within the NAPA the water 'sector' was included as one of the priority vulnerability and adaptation issues, along with forestry, agriculture, health and wider environmental concerns over projected climate changes. It was also recognised that water, as a resource, underpins the health and vitality of people, especially in rural areas, and their ability to provide for their families, and to maintain good health and the ability to sustain their livelihoods. Equally, appropriate sanitation services to protect both human and wider environmental health,

such as reef health, are important for rural communities, and will likely be affected by climate change impacts on freshwater supplies.

BOX 2: The Solomon Islands National Adaptation Programme of Action, 2009 (NAPA)

Nine priority sectors where adaptation actions are urgently needed were identified through synthesis of existing information on vulnerability and adaptation, community consultations and from vulnerability analysis conducted by the NAPA Team. A multi-criteria analysis and ranking was used to prioritize the sectors. Based on the high ranking of the priority sectors (i.e. sectors with importance factor of 10 and above) and the greater likelihood of accessing funding support from the Least Developed Countries Fund for the implementation thereof, a total of seven project profiles were developed.

The project profiles have been designed to reflect the need for urgent and immediate adaptation actions in the nine key vulnerability sectors, namely: 1) Agriculture and food security, 2) Water supply and sanitation, 3) Human health, 4) Human settlements, 5) Fisheries and marine resources, 6) Coastal Protection, 7) Infrastructure, 8) Waste management, and; 9) Tourism.

Agriculture and food security, water supply and sanitation, human settlements, human health, education, awareness and information have been included in one project (i.e. managing climate change impacts), while each of the others (fisheries and marine resources, infrastructure, waste management, coastal protection and tourism) has one project profile. In addition, given the highly urgent need for adaptation action in low-lying and artificial islands it was decided to develop one project profile focusing on urgent adaptation action to be implemented in these areas.

103. The NAPA identified initial water resources programmes to address climate change impacts. These included activities to improve water management practices to address current stresses on water supplies, and to build greater flexibility and robustness into water management systems to be able to better cope with variability, and predict through improved forecasting changes to hydrology. The NAPA suggested:

- Improving water management and water use efficiency to reduce vulnerability to water shortages
- Encouraging agricultural and wider land management practices to improve productivity and protect soil and water resources
- Engaging in forest management and watershed protection to improve yields, provide habitat and reduce flood hazards, and
- The implementation of programmes and projects to enhance capacity building at the national level with functions related to the management of water resources.

SIWSAP will adopt an IWRM approach to mobilise these NAPA identified objectives to reduce vulnerability to water shortages and protect the natural 'ecosystem' infrastructure islands are so reliant upon for water capture, purification and storage, thereby supporting multi-sectoral development and resilience.

104. The NAPA goes further to describe a series of programme and projects to help improve the resilience of water resources management to the impacts of climate change and sea-level rise. Key activities that need support include the promotion of operational hydrology through the collection, processing, storage, retrieval and publication of hydrological data. Improvements in hydro-climatological monitoring will provide better information for decision making, to ensure the most appropriate technologies are used relative to the operational and maintenance abilities of the institutions and communities concerned, including the main water supply utility for Honiara, Solomon Water. Under Component 2 of the NAPA Priority Actions, water supply and sanitation are specifically highlighted under four outcomes:

- Outcome 1: Integrate water conservation and sustainable water resources management in all sectors and communities
- Outcome 2: Incorporate climate change adaptation strategies into the guidelines and criteria for design and construction of appropriate water infrastructure in vulnerable areas
- Outcome 3: Increased reliability and quality of water supply to all sectors and communities
- Outcome 4: Enhanced institutional and legal framework for water resources management.

SIWSAP will specifically invest in improvements to hydro-climate monitoring, and cross-sectoral learning and application of adaptation response approaches to ensure that water is not a limiting factor in maintaining livelihoods and economic growth.

105. The key to sustainable and climate-resilient development in the Solomon Islands, as described in the National Climate Change Policy: 2012 - 2017 as a “a resilient, secure and sustainable Solomon Islands responding to climate change” is integrating climate considerations into the implementation and achievement of the Solomon Islands National Development Strategy (NDS) and other regional and international policies and frameworks.
106. Whilst the scale and impact of disaster events in PICs is often not significant enough to feature at the global level and in international disaster databases, they are substantial relative to the region’s economic, social and environmental context – with losses often in the realm of 25-100% of GDP. Initial research indicates that PICs are more prone to extensive risk (relatively small but frequent events affecting poverty and livelihoods, such as landslides, flash floods, coastal storm surges, water scarcity issues) rather than intensive risk – those events such as earthquakes, cyclones and tsunamis that can devastate countries and completely overwhelm national response approaches.
107. In addition to being a Party to the UNFCCC and its Kyoto Protocol which together make up the core of the international policy response to climate change, the Solomon Islands is also a signatory to the Hyogo Framework on Disaster Risk Management and has been involved in the European Union Global Climate Change Alliance programmes. At the Pacific Regional level, the Government of the Solomon Islands is a signatory to the Pacific Plan, the Pacific Islands Framework for Action on Climate Change (PIFACC), and the Regional Framework on Disaster Risk Reduction and Disaster Management. As a commitment to the Hyogo Framework for Action on Disaster Risk Management a National Disaster Risk Management Plan was developed in 2009 setting out the institutional arrangements for disaster risk management (DRM) and disaster risk reduction (DRR) measures¹⁷. National Progress Reporting on the status of implementation of the Hyogo Framework for Action (2011) showed some progress in implementing the Framework for Action. SIWSAP will support implementation of Area 1 and Area 2¹⁸ of the Hyogo Framework.
108. The Solomon Islands has agreed to develop an integrated risk planning approach. Instead of choosing the conventional way used in the region for developing a Joint National Action Plan, the Solomon Islands are exploring a strategic approach in the development context. The ongoing integration initiative seeks to develop a joint framework for resilient development which would be used to embed climate change and disaster risk considerations into development planning processes. SIWSAP will assist in the development of resilience approaches for national planning and policy development across sectors. The project will develop tools and approaches that focus on ensuring water availability and water quality, but also improved planning and water resource governance practices, including risk reduction from disasters.
109. The project falls within the priorities of the LDCF programming strategy that recognizes the special challenges for water resources and services within the context of climate change. The LDCF programming strategy states that “the linked impacts of climate change pose very complex adaptation challenges that are additional to the existing policy and management failures facing ..., water supply, irrigation, ... and water resources management, including commonly ignored areas of groundwater and coasts”. Climate-related stresses exacerbate long standing pressures on water resources, and also highlight existing management challenges and failures for water resources, and the water supply and sanitation services that water resources provide.
110. The LDCF strategy also indicates that “projections show billions of people will suffer from water and food shortages resulting in deepening poverty, further political instability, and forced migration” as a consequence of predicted climate changes. SIWSAP is designed to respond to these challenges and mobilize (and strengthen) the existing national policy frameworks developed to address climate change through appropriate adaptation approaches. SIWSAP will help address the call to improve ‘resilience’ – by improving adaptive capacity to respond to identified impacts of climate change on the water supply, sanitation and water resources of the Solomon Islands.
111. SIWSAP will help the country address some of these possible climate futures through improving water resource management, water supply and sanitation, and disaster risk concerns. An active policy

17 National Disaster Risk Management Plan: For Disaster Management Arrangements and Disaster Risk Reduction including for Climate Change. October, 2009. National Disaster Council, Solomon Islands Government.

18 Area 1: the more effective integration of disaster risk considerations into sustainable development policies, planning and programming at all levels, with a special emphasis on disaster prevention, mitigation, preparedness and vulnerability reduction. Area 2: the development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level, that can systematically contribute to building resilience to hazards.

environment within the national government institutions will support the implementation of SIWSAP. Equally, SIWSAP will aid in the implementation of activities designed to inform policy in a learning environment, and to strengthen the use of adaptation principles and approaches across national policy.

112. The link between the need for water resources, the benefits that water provides through a range of ecosystem 'services', including for water supply and sanitation, and the impact therefore of changes in precipitation and temperature are concerning in a country struggling to keep pace with population growth, and a complex geography for logistical support, little economy of scale, and limited technical capacities. Although there is a need to focus on rolling out further service delivery for water supply and sanitation services, as defined in the new Rural Water Supply and Sanitation Policy (draft, July 2013)¹⁹, there is a concern that the sector will struggle to cope with climate change impacts unless adaptation planning becomes more central to water resource management and water supply and sanitation design, construction, management and operation. SIWSAP will specifically work with the Rural WASH providers to increase the resilience of their activities and interventions, to mobilize current learning that is not getting picked up and integrated into policy discussions and activities on the ground.
113. The National Environment Management Strategy (NEMS) of the Solomon Islands was developed in 1991. Building on this, the National Biodiversity Strategic Action Plan (NBSAP) provides for the establishment of protected areas including around catchments and watersheds and the recently completed UNCCD National Action Programme (NAP) to Combat Land Degradation and Mitigate the Effects of Drought includes actions aimed at strengthening early warning and weather observation systems which SIWSAP will specifically support under Outcome 3. The National Waste Management Strategy and Action Plan (2009-2014) has identified pollution of underground water resources as an issue and includes actions to minimize pollution into water systems. SIWSAP will help support this strategy through protecting shallow coastal groundwater lenses and wider surface catchments.

2.3 Design Principles and Strategic Consideration

114. The key design principle for the SIWSAP project is to deliver on existing Government's national and subnational development priorities, as well as build on existing efforts that tackles the water resources in the region, the concerns over sanitation, hygiene and health related benefits, and the impacts of climate change on water resources. In this effect, the project will mobilize the new Rural Water Supply and Sanitation Policy (draft, July 2013) by uniquely taking the policy straight to implementation at the Provincial level. Often policy processes can get 'stuck' in national level dialogue and institutional delivery discussions. SIWSAP will mobilize this policy and strengthen rural WASH interventions medium term through targeted additional activities designed to improve strategic rural WASH services.
115. The project outputs are designed to fundamentally improve resilience of the water sector, from resources to the main daily interaction that people have with freshwater, namely through water supply and sanitation services. The focus will be on geographic areas, which are most vulnerable, and once identified, at the most vulnerable elements of the water 'system'. Pilot sites, identified during the PPG phase²⁰ will be used as demonstrations to both create and implement a water sector vulnerability assessment process, and from this develop Adaptation Response Plans. These will guide investments at the six sites. In turn, over the course of the project these sites will be used as 'demonstrations' to improve the resilience of the communities to climate impacts on their water systems, and for others from communities to Provincial to National level government to learn from through the use of learning practices, and 'strategic investment' opportunities – through the development of a competitive process for community driven adaptation interventions for project support (under Outcome 2).
116. Pilot sites were selected using national agreed criteria developed at the stakeholder Inception Workshop. These included that the sites were located in Provinces that were particularly mentioned for action and support in water management plans and in the NAPA because of significant climate change 'threats and vulnerabilities'. Furthermore, one baseline criteria was that the locations were included in existing priority water supply and sanitation interventions, through either donor projects, such as through AusAID, EU; UNICEF programmes or those of NGOs, and the Rural Water Supply and Sanitation Unit of

¹⁹ The Solomon Islands Rural Water supply, Sanitation, and Hygiene (Rural WASH) Policy, July 2013. DRAFT, v.11.

²⁰ SIWSAP Inception Workshop, 16-17 April 2013, Honiara.

the Ministry of Health and Medical Services. The sites were also chosen based on their known vulnerabilities to climate change impact on water resources. From discussions at the Inception workshop it was clear that sites were known to regularly run out of water, and had written specifically to government in the past to ask for support during periods of no rainfall. Equally, sites with Provinces able to provide technical and logistical support and willing, and sites with at least some element of baseline information were included within the overall selection criteria. Below Table indicates the pilot sites that were selected through the Project Preparation period. Details of the site selection criteria and methodology are included in Annex 3.

Table 2: SIWSAP Pilot Sites

Site	Province	Rural/Township
Taro Township	Choiseul	Township
Gizo	Western	Township
*Ferafalu (Manaaoba island)	Malaita (NE)	Rural
Santa Catalina	Makira/Ulawa	Rural
Tiggoa	Rennel and Bellona	Township
*Tuwo (Fenualoa island)	Temotu	Rural

*Note that from September through to March these sites are harder to get to due to weather changes.

117. Furthermore, the strategy the project will adopt is focused on better understanding and applying 'resilience in practice'. Resilience is defined by different agencies, including by the IPCC (2008) as '*...the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity of self-organization, and the capacity to adapt to stress and change*'. It describes a process whereby both natural, and human systems are able to both withstand shocks, and where and when necessary, rebuild appropriately.

118. SIWSAP will be guided by a structure, which will aim to build resilience, in alignment with national policy objectives for the Solomon Islands, regional objectives as a PIC, and the overall project objective to '*improve the resilience of water resources to climate change....*'. The resilience framework used to guide the project interventions is detailed in Annex 16.

Gender Issues to Consider during Implementation

119. Incorporating an understanding of social relations and power dynamics and adjusting projects accordingly, rather than simply targeting women specifically is a key step during project implementation. Changing human behaviors needs an understanding of different existing priorities, knowledge and constraints. Conducting appropriate levels of gender analysis at the individual Pilot Site level will help each Province to better understand the role of women and men in the use and management of water resources, and the roles they play in protecting the environment and reducing stress in the particular areas of an intervention²¹, and indeed how they are affected, and respond to the impacts of climate change on their roles in society. Gender issues have been mainstreamed into the project design and approaches and training available will be further developed and discussed with the Pilot Project Committees during the Inception period of the project. IWRM Community Mobilization Guidelines developed in the Pacific by the regional Pacific IWRM Programme will be used to foster support and action for the pilot site interventions. These guidelines include gender mainstreaming components for use and development throughout the project. These guidelines were developed by Live and Learn Environmental Education, a key partners in the implementation of SIWSAP. Despite this, the following gender aspects will be included, monitored and considered during project implementation:

- Establishing sex disaggregated data and include in project information systems for the pilot and replication sites

²¹ Ensure Environmental Sustainability: Halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation. Sub-goal 3: to promote gender equality and empower women.

- Choice of action to promote gender equality should be made on the basis of clear gender analytical information and sex disaggregated data, and on the basis of women's own priorities and concerns
- Developing staff gender-related skills, knowledge and commitment through training workshops, consultancy support, provision of guidelines, financing schemes
- Policy dialogue, ensuring disadvantaged groups, women, the young and the old are represented – provision of information to women – especially at the National Water and Adaptation Forum – with specific sessions on gender.
- Women and different age groups represented in Pilot Project Committees - promoting women's and men's equal participation in community level decision-making institutions and in community representation
- Development of procedures to promote equality in recruitment and career development – at least 50% of the SIWSAP Provincial Officers should be women
- Activities to link together individuals and groups working for gender equality
- Recognizing and addressing practical needs/problems identified by and particular to either women or men
- Promoting greater gender equality in relation to resources, services, opportunities and benefits, e.g. increasing women's access to previously male dominated employment opportunities
- Addressing inappropriate gender stereotypes, and gender challenges for example, women and children are more likely to fall victim of natural disasters (the 2007 tsunami in Gizo is an example of this when women fishing and the elderly were those who predominantly lost their lives).
- In developing capacity, and in their role as stewards of domestic water needs and sanitation concerns, especially regarding children, women, and women's groups and networks are key stakeholders in the SIWSAP project. They will be a key resource to the project during the development of the national Sanitation and Adaptation campaigns and participatory video and video diary activities.

UNDP Comparative Advantage

120. UNDP is well placed to partner with MMERE-WRD of the Government of Solomon Islands to enhance water resources resilience at national and community levels through the SIWSAP project. At the national level, UNDP through its presence in the Solomon Islands have worked on water resource management, climate change adaptation, and environmental equity and governance for many years through providing policy development and capacity building support. For example, the Human Security Initiative for Tensions 'Reduction', Reconciliation and Rehabilitation in the Solomon Islands, which seeks to enhance human security for selected communities and ex-combatants by reducing tensions and promoting peaceful and sustainable measures for their survival and dignity. Specific activities include objective 2-2 in component 2 that will enhance by up to 80% of the functional capacity of target communities to deal with conflict-affected water and sanitation management problems. The target coverage is 10 communities and for each community, the project will: a) establish and self-manage fully functioning water and sanitation committees; b) train local water and sanitation technicians in basic skills for installation of WatSan facilities; c) install water supply facilities; d) develop guidelines and manuals on operation and maintenance of community water supply; and e) install local monitoring mechanism. The total cost of this component is \$555,000 over a 2-year period until early 2014. Total project cost is \$2.71 million. The target beneficiaries are former combatants and communities affected by the civil unrest in 1998-2003, which are concentrated in the capital city of Honiara and the provinces of Guadalcanal and Malaita. The proposed LDCF project will cover some of the communities included in this baseline project to build climate resilience for the baseline activities.

121. Another related project that UNDP, supports in the Solomon Islands is the "Strengthening Environmental Management and Reducing the Impact of Climate Change in Solomon Islands" (SEMRICC) project. The objective of SEMRICC is to assist the Government of Solomon Islands in developing capacity for environmental management. It will focus on strengthening the executing capacity of national government agencies, provincial government and community institutions to address climate change and other environmental issues and challenges, and to mainstream natural resource conservation and environmental management. The project concentrates on the following areas: 1) strengthening capacity to develop and implement national environment policy and plan; 2) establishing information management and

scientific/technical knowledge base, 3) promoting community-based environment management and disaster risk reduction, 4) institutionalizing human resource capacities development and awareness raising; and 5) gender mainstreaming across all environment activities. SEMRICC is considered as a baseline project with respect to the policy and capacity building components for SIWSAP. The assistance provided to the government by SEMRICC is in the general areas of environmental and climate change policy and capacity building with limited consideration for sectoral policies (in the water and sanitation sector). These are important baselines upon which this project intends to build on by focusing on the water/sanitation policies and capacity building to build resilience in the context of climate change.

122. The commitment for UNDP to continue its strong partnership with the Government of Solomon Island in this area is also highlighted within the recently completed United National Development Assistance Framework (UNDAF) for the Pacific Region (2013-2017). The UNDAF recognizes that the general challenge for the Pacific Island Countries (PICs) is to ensure the sustainable management of their terrestrial and marine natural resources and heritage, from the regional to the local level, and the adaptation of individuals, communities and states to climate and environmental change and natural hazards, as well as to be well prepared to respond to natural disaster events and population related consequences. This is outlined within UNDAF Outcome 1, which states “Improved resilience of PICTs, with particular focus on communities, through integrated implementation of sustainable environmental management, climate change adaptation/mitigation, and disaster risk management.”
123. At a broader scale, UNDP supports governments and communities in the Asia Pacific Region, and globally, in their efforts to enhance their resilience to climate change impacts. Through the years of enhancing adaptation and resilience capacities, the organization now have developed tools, lessons learned, and know-hows which are widely shared through online platforms such as the Adaptation Learning Mechanisms (ALM) and through the support provided through the various centres and technical advisors working with UNDP country offices, projects, and its partners. The SIWSAP project has also allocated significant resources to learn from and contribute to this knowledge network through its knowledge management component (Outcome 4).
124. Furthermore, the SIWSAP’s objective to enhance water resource resilience in light of climate change aligns with the UNDP Strategic framework aims to ensure that “Growth is inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded (Outcome 1).” In addition, under the strategic framework UNDP works toward supporting countries, such as Solomon Islands to “have strengthened institutions to progressively deliver universal access to basic services (Outcome 3)” through making strategic project investments to enhancing the water and sanitation sectors’ adaptive capacities to climate change.

2.4 Project Objective, Outcomes and Outputs/Activities

125. The overall project objective is to improve the resilience of water resources to the impacts of climate change in order to improve health, sanitation and quality of life, and sustain livelihoods in targeted vulnerable areas of the Solomon Islands. The project will achieve this objective through four outcomes:
1. Water Sector – Climate Change Adaptation Response (WS-CCAR) plans formulated, integrated and mainstreamed in water sector-related and in broader policy and development frameworks – using action at the Provincial level to mobilize national level policy frameworks;
 2. The increased reliability and improved quality of water supply in targeted areas;
 3. Investments in cost-effective and adaptive water management interventions and technology transfer, and
 4. Improved governance and knowledge management for Climate Change Adaptation in the water sector at both the local and national levels.
126. The project structure consists of four Outcomes. Outcome 1 will focus on Water Sector Climate Change Adaptation Response Planning, using the framework of Integrated Water Resources Management (IWRM) to guide adaptation in the overall water sector through the development of Water Sector Climate Change Adaptation Response (WS-CCAR) Plans in six pilot provinces and communities as well as replication sites. Outcome 2 will implement these WS-CCAR plans at a series of Pilot sites focusing on increasing reliability and improved quality of water supply in target sites. Outcome 2 will support interventions that enhance existing water resilience such as diversification of water sources; protection and

restoration of ecosystems that protect critical water resources; improvements in water-use efficiency and overall demand-side management; use of innovative instruments; building on traditional knowledge; protection of freshwater lens through better sanitation practices in small islands (e.g., composting toilets). In addition, community-based Climate Early Warning and Disaster Preparedness Information System tailored for water resources management will be designed and implemented through a participatory process in the pilot sites. Outcome 3 will also support the implementation of WS-CCAR Plans in pilot sites, but focusing on investing in additional cost-effective adaptive water management and technology transfer. Strategic investments will be made in water infrastructure in target areas, including but not limited to: new household and communal water storage systems and infrastructure; design and construction of applicable small-scale climate-resilient reservoir in at least 1 site; provision of up to 4 portable water filtration and/or desalination systems for sharing across communities in times of extreme water scarcity. These interventions will be coupled with training and learning activities at the pilot sites to facilitate good maintenance and system sustainability, which is a crucial aspect of successful implementation and use of the climate adaptive water investments. Outcome 4 focuses on improving governance and knowledge management for CCA in the water sector at the local and national levels.

127. The activities proposed for each of the outcomes are described below.

Outcome 1: Water Sector – Climate Change Adaptation Response Plans formulated, integrated and mainstreamed in water sector-related and in broader policy and development frameworks

Co-financing for Outcome 1*:

Government of the Solomon Islands:	\$	250,000
MDPAC (EU EDF10 Sector Support)	\$	50,000
MDPAC (AusAID Sector Support)	\$	50,000
UNDP (PGSP)	\$	2,750,000
<hr/>		
Total Co-financing:	\$	3,100,000
LDCF Project Grant Requested:	\$	855,130
Total for Outcome 1:	\$	3,955,130

* Government: Malaita Provinces’ Rural Development Programme, and Choiseul Province’s provincial budget for water and sanitation sector, with National Government multiyear development budget for Water Resources Sector
 EU EDF10 Sector Support: Improving Governance and Access to WASH for Rural People
 AusAID Sector Support: Solomon Islands Access to Clean Water & Sanitation Initiative (SIACWSI)

Baseline (Without LDCF):

128. The National Water and Sanitation Sector Plan (draft, September 2013) states that while global evidence of climate change is increasing, there remain uncertainties regarding the magnitude and timing of climate change. This makes it difficult to fully understand and therefore predict the impacts of climate change on ecosystems across the Solomon Islands. Anecdotal evidence from communities already suggests that rainfall patterns are changing. Overall annual amounts may remain stable, but the intensity of rainfall, and the longer dry periods in between rainfall events has implications on water supply and sanitation needs, and the needs of the watersheds which provide water for people and nature, and the knock on livelihoods requirements for food production.

129. The Solomon Islands Government recognizes the need for a sector-wide approach to water resources management through its commitment to integrated water resource management (IWRM) development utilizing learning from the GEF/UNDP/UNEP Pacific IWRM Programme executed by SOPAC-SPC. The Pacific IWRM Demonstration Project for the Solomon Islands focuses on water management approaches for Honiara city water and wastewater services²². Although the project is only focused on Honiara, the understanding of IWRM as an approach has increased across the national level institutions involved. The project has also supported the development of the National Integrated Water Resources Coordinating

²² ‘Managing Honiara City Water Supply and Reducing Pollution via IWRM’. www.pacific-iwrm.org

Committee, and in the development of the national strategy and action plan (currently draft). Critical to the project, greater understanding has developed from local projects – in this case the Kovi/Kongulai Catchment, and the water needs of Honiara, a growing city with an increasing need for water. Water Safety Planning, leakage detection, and other technical approaches, working jointly with the development of stronger community engagement in watershed management through the Kovi/Kongulai Catchment Group has improved the management of water for the city, and improved the protection of the catchment as a water source, and a source of income for the local communities.

130. Yet, although vital at the project level, taking this experience, the learning, and the tools wider across the water sector and across the country remains a challenge. IWRM is also very much a new approach nationally, with only a small-scale demonstration approach in place but with success demonstrated through ongoing policy development. Mobilizing the policy, securing resources, and making strategic climate resilience investments in the water sector however, remains to be seen given failing statistics and sheer lack of data and information on water resources. In all government agencies, capacity is already limited to dispense basic functions and even worse, to address emerging issues such as climate change. Both supply and demand side management approaches do not yet integrate climate change impacts and IWRM approaches.
131. Projects such as this highlight the ongoing need for assistance with integrating climate change into policies, strategies and programmes. Planned engineering and quality standards for water supply systems still need to be developed and climate-proofed, and there is a pressing need to establish a more accurate understanding of the rural water supply, sanitation and hygiene situation across the country. Water resources assessments are not carried out to guide the planning of water supply systems and it is therefore not known how robust approaches are to climate changes. For example, anecdotal evidence from the World Bank Rural Development Programme suggests that, although some community systems are maintained by villagers with some technical knowledge, the location of the source can often be inappropriate, introducing contaminants into drinking water, or equipment that suffers from repeated flood damage, requiring frequent repair, and the costly sourcing of replacement parts. These simplistic impact specific point solutions are temporary in nature, and often expensive due to replacement and maintenance costs. Furthermore, project related interventions which fail are often 'picked-up' and repaired by the Provincial Government, who may have had no involvement in the project and so keep investing in a project driven intervention that may be inappropriate and actually weakens resilience.
132. At present, integrating adaptation into water resources and water supply and sanitation projects is absent. Newly mentioned in the draft rural WASH and National Water and Sanitation Sector Plan the recognition of climate change with evidence based learning, and projects designed to collect information and monitor the impacts are few in number. Where they do exist they have focused on collecting information at the national level to better understanding overall vulnerability. Yet it remains unclear how relevant these are for specific sectors or for water as a cross-cutting resource as information is not shared well, and the way climate change can impact different sectors not well understood or articulated. It is also not clear how action to adapt to climate change can be mobilized in such a decentralized country, but with the majority of capacity in the capital, Honiara, when the majority of social capital exists in community networks, and local institutions.
133. Water shortages, droughts, polluted groundwater due to coastal surges and erosion, together with increased storm impacts and flooding all contribute as hazards to rural and township development (National IWRM Diagnostic Report, 2007). Some of the pilot sites are certainly limited in their opportunities due to lack of water and fragile water resource situations. There is an absence of understanding as well as facilities to deal with extreme water scarcity events (Annex 5).
134. Existing projects working on water such as those supported by development partners (i.e. SIACWSI) and the UNICEF implemented Improving WASH in the Solomon Islands project focus on delivering WASH services, but not on the risks to these services from climate change. The longevity of interventions therefore, despite historical failures in governance and a lack of support and capacity development activities around WASH interventions, is at risk from lack of clean water, lack of storage, water quality concerns, equity of use, and flood and storm damage – many lessons exist from the World Bank rural Development Programme that has experienced exactly these types of risks.

Adaptation Alternative:

135. The overall aim of Outcome 1 is to develop Water Sector – Climate Change Adaptation Response Plans (WS-CCAR) at the provincial and community levels (six Provinces and six communities). Based on the National Water and Sanitation Sector Policy, Provincial governments as well as communities are now tasked to translate the national policy into their local contexts and SIWSAP will support the pilot provinces and communities to ensure that climate change adaptation considerations are mainstreamed within this process.
136. Within the timeline of the SIWSAP project these provincial and community plans will guide investments at sites. These local-level plans will also be shared at the national level (National Water Forum in Outcome 4) through the project lifetime, and will inform ongoing Ward Profiling, Constituency Development Planning, and Provincial Development Plans.
137. The water sector adaptation response plans will be designed in conjunction with the Provincial and community-level planning and budgeting process so that climate-resilient water sector initiatives can be mainstreamed and sustained after the lifespan of the project.
138. The provincial and community-level Water Sector – Climate Change Adaptation Response Plans will be developed based on: 1) Vulnerability assessments in communities/provinces that have yet to assess vulnerabilities of their water sector due to climate change impacts (Output 1.1), 2) policy formulation and/or integration at the community, provincial, and national level (Output 1.2), and 3) allocation of government budget based on Cost-Benefit Analysis (CBA) of proposed measures to reduce vulnerability climate change through enhancing water resource resilience.
139. A SIWSAP Project Pilot Committee (PPC) established at the provincial and community levels will lead the development of the Water Sector – Climate Change Adaptation Response Plans. The PPC will build upon existing institutions and mandates by placing a one officer within the Provincial Office RWSS in the six pilot provinces, as well as engage the Community Water Committee as the key SIWSAP focal points at the community level. The structure of the PPC is illustrated within the Management Arrangement Chapter V of the Project Document.

Output 1.1. *Vulnerability assessments of water supplies (in terms of quantity and quality) to climate change in targeted critical areas refined or formulated*

140. Vulnerability assessment at the community level in the six pilot sites has been completed during the PPG phase (Annex 5). Based on these assessments, each of the six pilot provinces will go through a detailed local participatory vulnerability assessments to guide the identification of predicted climate change challenges to the Water Sector. Different tools are available for this process, and it is recommended that tools such as CRiSTAL, CEDRA, VCA (Red Cross) or others are used²³ and modified appropriately.
141. The Provincial Vulnerability Assessment will be kicked off with an Inception Workshop in the six pilot provinces with PPC members and relevant stakeholders. During the Inception Workshop, the appropriate vulnerability assessment framework will be discussed and design, with inputs from the Community Water Committee members that have already conducted their vulnerability assessments in the PPG phase.
142. Based on the framework developed through a participatory process, vulnerability assessment will be conducted through partnership by a team of external experts and key local stakeholders. The vulnerability assessment will highlight key current and future vulnerabilities of the water sector at the Provincial level due to impacts of climate change. The assessment will also inform suggested approaches that can reduce vulnerability and/or enhance water resource resilience, which will be key inputs to the provincial level Water Sector – Climate Change Adaptation Response Plans.

²³ Rather than specify the exact tools to use, options are presented here. The actual final tool used will be selected by the Project Management Office based on their experience of using different tools and appropriateness for the Solomon Islands, guided by experience from the relevant Government Agencies and the Climate Change Working Group. This is to ensure SIWSAP is building on existing capacity and knowledge, and not producing yet new external methodologies for the country to re-learn.

Output 1.2. *WS-CCAR plans prepared in the context of IWRM and in line with and integrated into existing local and national policy and development planning processes*

143. Water Sector – Climate Change Adaptation Response Plans will not only demonstrate adaptation planning and response needs (actions-on-the-ground) at the pilot site level, but will also need to demonstrate how ‘additional’ activities in the water sector are required to future proof natural and built water storage and reserves for many different sectoral needs. This will have valuable lessons for the water agencies and wider sectors at the national level following the principles of IWRM. Through identifying the vulnerabilities of water supply systems at the pilot sites (both water quantity, and quality), the source of water, and the sink²⁴ (especially from sanitation), Water-Sector Adaptation Response Plans will be developed in the Provincial and community levels.
144. In accordance with the national level IWRM commitments, these plans will also take into account uses of water beyond drinking and sanitation needs, and include food production, preparation, and cooking, and other domestic needs such as washing. For township sites the range of water needs and uses will be much wider and will need to include a broader range of sanitation options, water supply options from strategic community and individual household water storage to standpipe development²⁵, watershed management and source protection concerns, and water for food production needs.
145. The Response Plans will also be guided by the Resilience Principles (Annex 14) to define the response needs on the ground, namely (i) diversity of water supply and storage options to ensure project beneficiaries have options available to them in the future; (ii) the project provides appropriate capital to ensure interventions are designed appropriately, using both built and natural solutions, and that interventions are designed to be sustainable through close involvement of the communities concerned; (iii) self-organisation (governance at different scales) – to ensure not only community engagement and decision making, but to also raise awareness and knowledge to allow communities to manage their own water supply and sanitation schemes long term, and; (iv) learning – to raise community awareness about water scheme management, the impact of climate change on their water resources and services, and the impact of their actions on water sources, especially concerning the quality of the water they rely on to maintain healthy lives.
146. Both the provincial and community-level Water Sector – Climate Change Adaptation Response Plans will be developed through consultation and participation of key stakeholders. Participatory design workshops will be held with key stakeholders including government officials, technicians, farmers, fishermen, women’s groups and children where key findings from the vulnerability assessment will be shared, and based on that, needed and sustainable solutions will be identified to build long-term resilience to current and future climate change impacts to the water-sector. In some cases, it may be appropriate to take material and equipment suppliers to the pilot sites so they can better understand the technical needs and then identify the best options for the sites. Provincial Government Staff from Public Works, Environmental Health Divisions (PEHD), and other relevant agencies will also be involved in the development of the response plans to ensure they can be integrated, as easily as possible, into local planning processes. Current Ward mapping/profiling socio-economic assessments will help inform the development of the Adaptation Response Plans.
147. The design workshops will not only serve as a forum to obtain inputs to the Water Sector-Climate Change Adaptation Response Plans, but also as a forum for information sharing and awareness raising. Consultations during the PPG phase strongly indicate that maintenance and behavioural change is a key challenge to the effective adoption and sustainability of water-sector interventions from water storage to sanitation. Therefore, SIWSAP will engage not only the suppliers but also the users of the water systems will be engaged in designing the Response Plans, which will guide investments at the Provincial and community levels. All interventions proposed in the plan will include a maintenance strategy.
148. Furthermore, the Response Plans will be informed by the national information available from other projects and programmes focusing on assessing vulnerability including the EU Solomon Islands Climate Change Assistance Programme supported through budget support. These plans will provide information for more informed decision making within the project – as a demonstration through working with Provincial

²⁴ Meaning the drainage area, - where does water used drain to – mangroves, ground near well, beach, etc.

²⁵ Guided by the new Rural Water Supply and Sanitation policy to ensure appropriate and ‘policy aligned’ interventions.

Government of the changes in information requirements and decision-making required to reduce the potential risks of business-as-usual approaches.

Output 1.3. *Government budgets allocated to support implementation of key components of WS-CCAR plans*

Cost Benefit Analysis of Proposed Water Sector Adaptation Options

149. In order to make informed and realistic decisions on which water sector adaptation options suggested by the Vulnerability Assessment and stakeholder consultations that the provinces and communities can commit to implement, a Cost-Benefit Analysis (CBA) will be conducted. A CBA will not only assist the provinces and communities to understand how much may need to be budgeted within their Water Sector Plans, development plans, and annual budgets, but will also provide useful information to understand which interventions may allow them to achieve maximum water resource resilience with the least cost. Linkages may be made to the Pacific Cost-Benefit Analysis (P-CBA) where tools, lessons, and expertise from other Pacific Island Countries can be derived for application to the context of the six pilot Provinces and communities of SIWSAP.

150. Based on the vulnerability assessment, community consultation and CBA, the Water Sector-Climate Change Adaptation Response Plans for the six pilot provinces and communities will be finalized, validated, and adopted. Local-level Water Sector-Climate change Adaptation Response manuals (both text and audio-visual forms if appropriate) that captures the processes, good practices, and lessons learned in the six pilot provinces and communities will be developed and disseminated at the national Water and Adaptation Forum as part of Outcome 4. At this Forum, key principles identified through the provincial and community WS-CCAR planning process will be shared for integration within the national policy context.

Replication

151. Utilizing the experiences, know-how, and knowledge materials produced through the process of developing provincial and community-level Water Sector-Climate Change Adaptation Response Plans, this effort will be replicated to 6 more provinces and communities. Provincial and community leaders from the six pilot provinces and communities will be deployed as trainers and facilitators to guide the additional provinces and communities to undergo the necessary vulnerability assessment, community consultations, and CBA to develop the Water Sector-Climate Change Adaptation Response Plans.

Table 3: Summary of Main Activities for Outcome 1

Output 1.1. *Vulnerability assessments of water supplies (in terms of quantity and quality) to climate change in targeted critical areas refined or formulated*

- 1.1.1 Establish Pilot Project Committees (recruit staff to be placed within the RWSS/EHD of the pilot provinces as well as mobilize Community Water Committees in the pilot communities)
- 1.1.2 Design Water Vulnerability Assessment Framework through Inception workshops in pilot sites
- 1.1.3 Establishment of Water Vulnerability Assessment team
- 1.1.4 Conduct water vulnerability assessments in 6 pilot provinces
- 1.1.5 Propose measures to reduce priority Water Vulnerability in 6 pilot provinces and communities
- 1.1.6 Develop training package in development and use of the water vulnerability assessment process

Output 1.2. *WS-CCAR plans prepared in the context of IWRM and in line with and integrated into existing local and national policy and development planning processes*

- 1.2.1 Host participatory design workshops at 6 pilot province and communities, to get inputs to the WS-CCAR based on an enhanced awareness of water sector vulnerabilities within the respective provinces and communities
- 1.2.2 Develop training package for participatory WS-CCAR design methods that engages various stakeholders including government officials, technicians, women, and children, etc.

Output 1.3. *Government budgets allocated to support implementation of key components of WS-CCAR plans*

- 1.3.1 Conduct cost-benefit assessment of interventions proposed through vulnerability assessment and participatory design workshop to select most appropriate activities, in consultation with the PPC's and other beneficiaries
- 1.3.2 Develop proposed budgets for selected water resource resilience measures to be integrated into

- the WS-CCAR, development policies and/or annual budgets
- 1.3.3 Finalize costed WS-CCAR plans in the six pilot provinces and communities
- 1.3.4 Validation and adoption of the WS-CCAR plans
- 1.3.5 Develop training package in development and use of the CBA approaches applied to water sector
- 1.3.6 Conduct replication site assessments and selection of 6 provincial and 6 community replication sites
- 1.3.7 Training and facilitation of WS-CCAR plans in replication sites led by 6 pilot provinces and communities
- 1.3.8 Finalization of WS-CCAR plans in replication sties

Outcome 2. Increased reliability and improved quality of water supply in targeted areas

Co-financing for Outcome 2*:

Government of the Solomon Islands:	\$	1,400,000
MDPAC (EU EDF10 Sector Support)	\$	14,600,000
MDPAC (AusAID Sector Support)	\$	3,800,000
UNDP (PGSP)	\$	1,000,000
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Total Co-financing:	\$	20,800,000
LDCF Project Grant Requested:	\$	1,790,430
Total for Outcome 2:	\$	22,590,430

* Government: National Government multiyear development budget for Water Resources Sector
 EU EDF10 Sector Support: Improving Governance and Access to WASH for Rural People
 AusAID Sector Support: Solomon Islands Access to Clean Water & Sanitation Initiative (SIACWSI)

Baseline (Without LDCF):

152. Rural water supply, sanitation, and hygiene is now recognized as a priority for the government. Improved WASH cuts disease, especially for children, reduces healthcare costs, decreases violence against women, and can increase school attendance, particularly for girls. Many rural communities across the country spend large amounts of time collecting freshwater, and with open defecation and other sources of pollution there is concern that unprotected freshwater sources are becoming increasingly polluted. However a lack of data for monitoring these issues is a clear problem to mobilize action in solving the WASH problems. With the population increasing at an average of over 2%, finding the resources and providing clean water services to a wide range of rural communities is a challenge.
153. High failure rates of water supply systems, with around half failing or underperforming are due to many factors. Lack of ownership by communities, inadequate social involvement and capital building, poor or no training of communities in their roles and responsibilities, and in particular for operation and maintenance and financing is not improving the situation. The statistics for sanitation are worse, with an estimated 18% of the rural population of 404,072 people having access to a toilet. This is the lowest in the Pacific region, and one of the lowest rates globally. Poor technical designs, subsidies, discouragement, and lack of community involvement and awareness have limited the development of the sanitation sector, and interest in providing sanitation services.
154. It is estimated that the government has the capacity to deal with around 6,000 rural people a year, according to UNICEF, but at a population growth rate of over 2% (in some cases over 4% for particular islands) addressing these issues requires development partner support. The complexity of climate change has not been considered in the water sector until now. Driven by the need for data and information collection, and focusing so far on food security and crop production, especially on outer islands, adaptation approaches have bypassed the water supply, sanitation and hygiene sector, including the wider impact on water resources, in particular groundwater. No consideration is made regarding diversity of water sources, or protection of surface and groundwater to climate change impacts, and stresses put upon the water resources as a consequence of people responding to other climate impacts, such as coastal erosion. The policy environment is currently going through a phase of addressing the lack of recognition of climate change for water resources, but it is some way off mobilizing this policy given the challenges in the sector already.

155. The Solomon Islands Access to Clean Water & Sanitation Initiative (SIACWSI) is an ongoing initiative started in 2008 with development partners and the MHMS. AusAID is a lead donor to the Health Sector, providing around AUD \$20m a year, and has supported the development of the National Health Strategic Plan 2011-2015 which prioritizes rural WASH. Support for SIACWSI is provided through sector health support. SIACWSI is designed to mobilize rural WASH activities with other development partners, such as the EU improved governance and access to WASH for rural people sector support to MHMS. SIACWSI aims to (i) increase coverage of WASH in rural areas, (ii) improve sector coordination, capacity and equity, (iii) establish sustainable and inclusive operation and maintenance models, and (iv) establish sustainable systems for improved hygiene awareness and to create demand for socially inclusive sanitation. Building Human Development: Improving WASH in the Solomon Islands is an initiative funded by the EU Water Initiative and implemented by UNICEF. It focuses on Choiseul, Isabel, Renbel, Makira, and Temotu Provinces – and in some towns in those provinces. This project will focus on improving water supply and sanitation facilities to communities and schools, and to help mobilise sector reform for improved WASH and to mobilise the new rural WASH policy. This project will be a key co-financing partner for SIWSAP, in particular for the delivery of this outcome.
156. Improved governance and access to WASH for rural people – is a sector reform contract to the Solomon Islands government from the EU focusing on improving the living conditions of rural populations through implementation of the rural WASH policy and in scheme design and construction across the Provinces. MHMS-EHD – are already a key partner in SIWSAP as a co-implementer. The expected funding for this is in the region of €17m. The actual implementation of these funds is due to start in 2014, in line with this proposed project.

Adaptation Alternative:

157. SIWSAP will mobilize action in the water and sanitation sector to include adaptation planning in rural WASH and water resource interventions funded by the Government and development partner funds. The primary focus on this component is to use the WSCCAR plans and mobilize them through target interventions designed to improve the resilience of water supply and wider water resource protection and management at selected sites. The sites are dispersed, and although face different vulnerability challenges, the interventions are similar.
158. A number of activities are envisaged – the critical element to them is building sustainability in the interventions through the development of operation and maintenance plans and community funds. The costs of adaptation need to be recognised and understood, as the pilots sites are critical to feed into the Provincial adaptation planning process, and realistic figures need to be used for scaling up in the planning process.
159. Both Outcomes 2 and 3 aims to implement the WS-CCAR in a way that is sustainable and replicable. In doing so, the focus of Outcome 2 is on enhancing existing capacities and awareness of climate resilient water management, such as rehabilitation and protection of existing water sources, as well as catalyzing institutional and behavioral changes to practice water conservation, especially in light of water-scarce situations. Pilot site communities need to become future advocates for the water and adaptation planning approach, protecting sources of water, and mobilizing adoption of water conservation practices within the selected sites and beyond. This component has substantial synergies with Outcome 1, and the strategic investment process. Sites will become demonstrations for people to learn from, and replicate using SIWSAP support. Uniquely, this approach combines water supply and sanitation approaches with wider water resources, including groundwater management. The multiple nature of water resources and their uses needs to be reflected in a move away from traditional sector approaches to what has become known as integrated water resources management, and lately has incorporated a greater understanding of ecosystems and the services they provide. At its most complex level IWRM involves cohesive decision-making concerning the development and management of water resources for various uses, with all decisions made and agreed upon by relevant stakeholders. This project will use and strengthen this approach through integrating adaptation into project implementation to improve the resilience of communities to climate change impacts and disasters. IWRM is already used in some cases as a valid

framework for managing disaster risks and responding to disasters because it is cross-sectoral in nature, and involves multi-stakeholder participation at different levels²⁶.

160. Project interventions are expected to significantly improve the water provision situation, and develop and protect strategic water reserves, and will also initiate a process for community identification of disaster risk and costed response plans. Pilot sites will provide information on the cost of adaptation for Provincial planning purposes, to ensure that interventions can be sustainably accounted for in national budgets by the end of the project, through demonstrating the value of the process. Including Gizo and Taro, as the Provincial Capitals is key to show decision makers the advantages of project interventions.
161. Beyond pilot projects and active demonstrations, the project will support policy development through improving climate change information and knowledge, and interpreting this for policy through communicating lessons from field projects – targeted at the water sector, including rural WASH, but relevant across many sectors where water has relevance (for example, agriculture and irrigation investments, hydropower which also fall under the mandate of MMERE).

Output 2.1. *2.1.1 Community-level WS-CCA soft and concrete measures implemented to improve sanitation and water supply in times of scarcity, that may include, but not limited to: diversification of water sources; protection and restoration of ecosystems that protect critical water resources; improvements in water-use efficiency and overall demand-side management; use of innovative instruments; building on traditional knowledge; protection of freshwater lens through better sanitation practices in small islands (e.g., composting toilets) (in about 6 sites)*

162. The assessment for vulnerability of water assets to climate change threats and adaptation interventions at the pilot site locations was conducted based on secondary data and information, and supplemented by rapid on-site field inspections during PPG Implementation (Annex 5). In addition to existing but limited scientific information, the process built on local knowledge and information and emphasized an expert judgment and stakeholder experience and opinion approach.
163. Secondary data and information included those derived from systematic observations and assessments of climatic and non-climatic variables. The major climate variables being temperature, rainfall, sea surface temperature, sea level rise, tropical cyclones, flooding, etc., which are assessed by the Solomon Islands Meteorological Services (SIMS), and the Natural Disasters Management Office. The non-climatic information included natural systems, and prevailing socio-economic conditions that were researched and documented. Following the need to collect further relevant information, workshops and discussions were also conducted with different stakeholders during the PPG missions.
164. The vulnerability of water resources on site were subsequently analysed based on a matrix system (Annex 5). The first column of the matrix presents the assets being identified under water resources and systems, while column two identifies the threats to these assets. Columns three and four give rating for the exposure of the assets to the threat and a measure of sensitivity of the assets to the threats. The fifth column presents the rating of impact (risk) based on expert assessment of the exposure and sensitivity of the assets to the threats.
165. A Matrix approach was used for assessing vulnerability as it is a thorough process and operates in a logical manner, which allows the project to take into consideration a number of dimensions for considerations. For example, the climate change threats and their effects were defined, and the exposure of these threats and how sensitive they are to the different water resources and systems are analysed with qualifying criteria that were developed for exposure and sensitivity, respectively. The table was then used to assess the impact of the threats to the assets as a product of the two events. The determination of the vulnerability of the assets to the threats was also guided by a vulnerability matrix table.
166. However, one exception was the pilot site at Tuwo, in Temotu Province. The same process could not fully take place due to difficulties in planning the PPG and logistical issues with poor weather late in the season. A scoping study was however used that gathered the necessary information in terms of the most recent impacts of sea level rise on land mass, crops and socio-economic conditions of the Reef islands in

²⁶ Dalton, J., Murti, R., and A. Chandra. 2013. *Utilizing Integrated Water Resource Management Approaches to Support Disaster Risk Reduction*. In Renaud, F.G., Sudmeier-Rieux, K., and Estrella (Eds) *The Role of Ecosystems in Disaster Risk Reduction*. United Nations University, Tokyo.

Temotu province. Further information, including the vulnerability matrices for the pilot sites are in the pilot site reports in Annex 5.

167. As explained under Outcome 1, an inception and awareness raising workshop will be held with the communities involved to explain the project and verify the project interventions, and adjust as necessary based on changing circumstances. Critical to the sustainability of the project, and learning from other regional GEF projects such as the International Waters and PACC project executed by SPREP, and the Pacific IWRM Programme executed by SPC/SOPAC, is the development of a learning approach to the project. This is embedded in all the activities under each Outcome, but it is also a core element to build resilience. In this case there are two learning needs, (i) to learn from communities about local resilience, and to ensure adequate consultation and discussion before decisions are made in order to not invest at sites that could weaken resilience, and (ii) learning within the PMU for the correct project approach and application of activities, so that interventions at replication sites and beyond are efficient in roll-out.

168. Based on the desktop and field-level preparation work conducted during the PPG phase, SIWSAP project will utilize four main categories of interventions to enhance existing resilient water management capacities in the pilot sites. These approaches include: **1) enhancing strategic rainwater storage, 2) sourcing/rehabilitating sustainable water source, 3) developing groundwater management protocols, and 4) improving sanitation conditions.** Each of the Pilot sites is discussed below, with a summary outline of activities per site. These designs will be revisited at project start as outlined above to ensure they remain appropriate and to maximize the investment opportunity. Further details are provided in the Pilot site reports in Annex 5.

169. **Pilot #1: Taro Township, Choiseul Province** - Taro township is an island with limited space. A large portion of this limited land is allocated to industrial use, where almost 40% of the island is used as runway for the airport. Its population is estimated at 1,423 where 760 (53%) are male and 663 (47%) are female and 408 (28%) are youth and children. Solutions to meet the water demand in a small island with a high population growth rate and density is therefore limited. The predicted impacts of climate change on the existing water resources as well as institutional assessments were conducted at the site during the PPG. Based on these assessments, SIWSAP will support the following interventions to enhance existing water resilience capacities in Taro Township:

1. Enhancing strategic rainwater storage

Construction of additional rainwater storage, in households, community and government buildings as strategic storage during dry periods are required. Therefore, roof catchments of residential and public buildings, such as Sport Centre, government building, and churches, will be rehabilitated through the support of SIWSAP. This will require a detailed assessment of roof sizes, suitability, materials required such as guttering, etc, and the development of a clear management policy for the maintenance of community water reserves and their use. Estimated budget of this intervention is \$45,000 with the entire 300 people of Taro benefiting from the interventions. Detailed project interventions are provided in the Annex 5.

2. Sourcing/rehabilitating sustainable water source

As a strategic reserve, effort is required to locate an alternative water source. A spring located 8km away on the main island of Choiseul could provide an alternative safe water supply for Taro town. The spring was visited during the PPG phase and rapid discharge and quality tests were conducted. The flow was found to be 2lts/sec, but it is not known if this supply is constant. With increasing climate variability, the community has become, at times, vulnerable to severe water shortages. Under this component the following activities will be undertaken:

- Feasibility study for the use of the spring as an adaptation response for use as a strategic reserve – using the appropriate technical capacities to assess the flow rate, reliability of supply, water quality testing, and possible pollution sources affecting the water quality.
- An assessment will need to be made regarding the governance issues surrounding land tenure and ownership of the spring, the land it drains from, and flows over. If the spring is found to be a stable and clean resource, ideally the project should attempt to secure the resource as a strategic reserve, in negotiation with the Provincial Government and land owners and communities concerned.
- The project may also consider minor development of the source including some small-scale headworks to protect the source, and initial piping to a collector tank.

- Development of an operation and maintenance schedule, including financing and stakeholder/institutional responsibilities for the spring, should even minor development of the source (as described above) take place. This is important to ensure the source, if viable, does not become polluted or 'forgotten'.
- If the source is developed, it is advisable for the Provincial Government to develop a protocol for the use of this water during periods of drought or other 'emergencies'. This includes collection, of water, shipping and logistical issues concerning distributing the water around the town and communities, responsibilities, equity of distribution (not to just government workers). The project will help with this is requested.

Furthermore, SIWSAP will support rehabilitation of hand-dug wells in Taro Township so that water quality can be improved. Currently, water inside the hand-dug wells are mostly brackish, therefore not suitable for drinking but suitable for washing and bathing. During the project, an earth sensitivity survey will be conducted to determine the water layer structure and water lens volume as well as inform appropriate and effective technologies for water pumps. Based on this analysis, rehabilitation of 15 wells will be implemented with estimated cost of \$55,000.

3. Developing Groundwater Management Protocols

13 out of 15 wells (87%) contain water that is suitable for washing and bathing, but which is unsuitable for cooking with or drinking. Most of the wells have been hand dug and are lined with concrete. The following activities will be undertaken.

- A groundwater survey. Estimated cost of \$75,000. This would require equipment necessary for an earth resistivity survey to better understand the groundwater characteristics, and to take samples for water quality testing to determine if, under a certain collective management regime, groundwater could be considered a source of freshwater. The management regime would be based on a sustainable pumping rate for the groundwater to ensure sustainable yield of potable water. However, this also requires protection of the water resource as an underground water catchment. For this approach to work, maintaining the quality is also determined by preventing pollution into the groundwater from surface sources. In line with the Rural WASH policy, wells are a useful and if well managed correctly, sustainable secondary source of water.
- During the PPG phase it was apparent that a shallow wetland area in the middle of the island may also be a key groundwater recharge area. Despite this, the wetland area is used for the disposal of solid waste, containing plastic, food, metal and other waste. The project will look at options to clean up this site, remove the waste safely and dispose of it appropriately following the National Waste Management Policy. Options will be discussed with the communities and town to look at how this site can be better protected as a freshwater recharge area. Investigations will need to take place into the quality, and actual recharge value of this area, and if this is indeed important for the resilience of freshwater supply, the project will look at options to protect the site, and will implement them with the appropriate stakeholders.

Leaving this potential freshwater source to degrade is a missed opportunity to help the island adapt to climate change. Degradation and pollution puts pressure on existing sources of freshwater. This requires additional investments to be made to source freshwater, when better management, recognition, knowledge and information can lead to the better management and utilization of existing resources as an adaptation response.

4. Improving sanitation conditions

As there is no way to empty the septic tanks in Taro safely, or anywhere to dispose of the waste, it is recommended that a change to sanitation approaches, including open defecation is mobilised through implementation of the new Rural Water Supply, Sanitation and Hygiene Policy.

Groundwater is a resource that needs to be protected for three reasons: (i) it is a useful resource for bathing and washing, and some small scale irrigation uses. Polluting the water further would render it unsafe for these uses, and people would therefore use potable water from rainwater tanks for non-potable uses, thereby using strategic reserves; (ii) depending on the investigations into the groundwater, reducing pollution and better management of the resource may yield a safe potable water supply. Polluting this

further will effectively narrow down water supply options for the town into the future; and finally (iii) in order to maintain the resource, it needs to be protected from pollution, especially sanitation waste from poorly designed sanitation interventions. The project will take a four year strategic approach to sanitation marketing in Taro town.

The aim of these sanitation interventions is behaviour change through community awareness, knowledge generation and self-empowerment, rather than project 'hand-out' approaches which often do not lead to sustainable change. Using Taro as a key 'demonstration' site for sanitation change for the wider Choiseul Province is critical and the project would provide additional resources for promotion of sanitation across the Province in local languages. Sanitation Champions, identified during the project will be supported by the project to lead and grow Provincial Campaigns for sanitation development under the national 'Our Sanitation Future' Campaign.

170. **Pilot #2: Tigoa Township, Renbel Province** - Tigoa has the advantage of being relatively small in size, but still a Provincial Administration and an area of economic growth for the Government to focus on. The population of Tigoa is around 543 with adult males 95 or 17% and females 100 or 19%. The population of the entire province is estimated at around 3,000. It has a serious shortage of available climate data, information, and therefore knowledge over the years to understand changes in rainfall and temperature, and other factors to really assess the status of its water resources. Many options exist to secure more strategic water resources, and diversity of sources, but it is unknown how sustainable these sources are, what the quality of them is (on a consistent basis), and what the threats are to these sources from pollutants. Polluting the groundwater sources would significantly reduce the resilience of the town. Furthermore, it appears that good sources of water, such as a well near the Provincial Administration building has not been properly looked after and protected. An existing water supply scheme has been damaged, and incorrectly established and rehabilitation of this scheme may be considered. Utilising the proposed project strategy of developing the WS-CCAR Plans to identify the adaptation needs for site water management, the following proposed activities will be reviewed and improved during the inception phase of the project, and then implemented.

1. Strategic Rainwater Storage

Although not large in population, Tigoa is a township geographically spread out; essentially a collection of communities that are linked together through different roads and paths as communication routes. Water also binds them together, given their collective location close to groundwater wells in caves. Enhancing storage capacity especially at the community and household levels are crucial during dry periods. This includes women's resource centre building, provincial building, churches, rest houses, and residential buildings. Detailed project interventions are provided in Annex 5.

To complement the groundwater which is subject to other risks, and partly because of the distributed community, a reticulated network would be challenging to implement because of ownership, operation and maintenance, and financing costs medium term and beyond, it is recommend that a detailed rainwater harvesting survey is conducted. This will need to assess the possible rainwater capture areas, and therefore the current tank capacities required relative to population needs. The project should then invest in rainwater tanks, roofing materials and guttering to improve individual household storage (because of the decentralised nature of the town). In consultation with the community and Provincial Administration, strategic storage options such as tanks and community reservoirs should also be considered a suitable option, particularly using large roof areas such as community buildings, Churches, etc. Training in maintenance of the rainwater harvesting technologies will also be required, including hygiene practices to preserve the quality of the water in tanks.

2. Groundwater Wells and Caves

The use of groundwater in shallow wells, or from caves is a historical practice, especially during drier periods. However, this water can sometimes be contaminated from birds and/or bats in caves. Furthermore, as a raised coral atoll, pollutants can rapidly move through the porous rocks due to the high hydraulic conductivity. Consequently, there is a need to protect these sources of water from surface pollution. It is recommended that a selection of sites are identified (Hutuna was visited during the PPG

phase) as strategic Provincial reserves, and a process is initiated with landowners to discuss the options for protecting and preserving these unique habitats and natural water wells. Land ownership is however complicated in Renbell, focusing on patrilineal kinship and the transfer of land through the male side of the family.

Consequently, a long term process of discussion needs to be initiated, led by the SIWSAP Provincial officer and supported by the PMU to enter into open and collaborative discussion with the landowners to look at sustainable long term protection options of the freshwater caves – such as the establishment of a payment schemes for ecosystem services approach or water fund as a key element of ecosystem based approaches within an IWRM strategy – to focus on preservation of the source for the wellbeing of the wider community during dry and drought periods.

3. Source Protection, Rehabilitation, and Expansion Options

The well at the Provincial Administration will be cleaned and rehabilitated as a developed source of potable water. During the PPG mission it was found to contain hospital waste and was slightly acidic, although the acidity is normal in limestone and should not be a concern. This source should be rehabilitated if the water is of adequate quality, and large tank supply installed as a community reserve for dry periods, provided the well sustainable pumping rate and quality is acceptable.

In discussions with the UNICEF²⁷ project working in Tigoa, and with the Provincial Administration, SIWSAP will consider a feasibility study to assess the rehabilitation options of the current gravity fed water system that has been damaged. Rehabilitation of this system should however, not be fully funded by the project, but with Government support. Any feasibility study should also take into consideration development of other sources (such as at Hutuna which was recommended by the community during the PPG).

4. Improving sanitation conditions

The PPG phase highlighted that there are a few septic tank systems in Tigoa, combined with some personal pit latrines, and wide use of the bush. With no ability to empty the septic tanks waste will be leaking into the groundwater. As with other sites, polluting a pristine source of groundwater due to poor sanitation practices is a poor water management practice, but also harmful to water reserves during dry periods, when water may exist but cannot be used due to pollution. Sanitation, given the lack of coverage in Tigoa, is therefore a major concern, given the population growth rate at over 2% per annum, and the existing dry periods of up to 3 months that the community experiences, with inadequate tank storage. Groundwater may become an increasingly used resource for drinking, cooking and other domestic needs.

The project will build on the UNICEF project 'Building Human Development: Improving WASH in the Solomon Islands'. This project will work in Tiggoa and is looking to develop some water supply provision, and to focus on sanitation and participatory hygiene development, sanitation marketing, water quality monitoring and capacity building. In this particular case, SIWSAP interventions will expand on the UNICEF sanitation interventions through ensuring adequate consideration has been given to medium term water storage and water quality issues, particularly in relation to an increased sanitation options. The hydrogeology of Rennell makes sanitation a particular concern to maintain groundwater quality, and this process will be supported by the SIWSAP project to ensure that an increase in sanitation provision does not negatively impact current water resources. Further activities by SIWSAP will include:

1. Creation of a local hygiene campaign to alert people to the risks around common WASH disease, etc – working with UNICEF, MHMS-EHD and the relevant Health Promotion Unit.
2. Through consultation, and with UNICEF, selection of willing families to trial new latrines, including composting or dry toilets, funded by the project, as 'demonstrations' of households willing to 'try' latrines. This will include a series of monitoring activities with the families and communities involved where pros and cons of the latrines are openly discussed within the communities. The aim is to use these pioneering families and households (including government offices and small businesses) to be 'live' monitors for toilet use, who report back on a regular basis to the wider community and town on their perspectives regarding latrine use relative to open defecation on the beach/mangroves.

²⁷ UNICEF implemented the EU Water Initiative 'Building Human Development: Improving WASH in the Solomon Islands'.

This way, transparent perspectives are presented to the town and communities- and they can therefore make the choice about what they want to do for their 'sanitation future'.

171. **Pilot #3: Santa Catalina, Makira Province** – Santa Catalina is a small raised coral atoll approximately 3.2km long and 2km wide. It has an estimated population of 1,304 people where 293 or 22% are adult males and 321 females (25%). The children and youth are 690 or 53%. There are 253 houses of which 15 service houses such as a clinic, primary school, and churches. Residents of Santa Catalina suffer frequently from severe water shortages due to climate-induced droughts. It is also frequently affected by cyclones and earthquakes. It is considered to be highly vulnerable to cyclones, coastal and river flooding, tsunami risk due to its proximity to a fault line. There are no climate recording stations on the island, and nearby information was used to assess the site. The island has three villages on it which divide themselves into 8 zones for administrative purposes. The island has benefitted from a variety of different donor interventions over the years, with these still evident including rainwater harvesting tanks, a fuel power pumped reticulate system, and both naturally occurring and some shallow hand dug wells which are traditionally used for bathing and washing. Sanitation practices are open defecation on the beach. A few small septic systems exist, but there is no ability to empty them or safely dispose of the waste, and no running water. Utilising the proposed project strategy of developing the WS-CCAR Plans to identify the adaptation needs for site water management, the following proposed activities will be reviewed and improved during the inception phase of the project, and then implemented. Four main areas of intervention will be undertaken in this pilot project site.
172. Climate change threats at the site include the challenge of dealing with sea level rise, and increased storminess, and extremes of precipitation and dry periods. This has affected the quality of the shallow groundwater, which reduces in quality and quantity during dry periods, in part due to its nature as a raised coral atoll. The island is strongly affected by ENSO, with long dry periods during El Nino and intense rainfall during La Nina periods. The strategy for the site based on the PPG assessment is as follows.
173. Increase storage capacity to provide a reasonable supply of freshwater for all the population during dry periods through the following interventions.

1. Strategic Rainwater Storage

- Rainwater harvesting - there are rainwater tanks in abundance, but no way to connect them to existing roofs. The roofs themselves need rehabilitating, with the provision of guttering and training in maintaining clean safe water. SIWSAP project will support rehabilitation of 10 water storage tanks connect to small roofs purposefully built in the 8 zones within the districts.
- Further rainwater harvesting tanks with their own roofs are also required for small household level supply – the current distribution is based on zones, and not on number of households. Consequently, some households only have storage for a few days, others of a few weeks. The distribution of storage needs to be made more equitable. In order to address this issue, SIWSAP will allocate 4 additional tanks for more equitable distribution of water. The estimated beneficiaries of this intervention is 500 people costed at \$ 70,000.

2. Sourcing/rehabilitating sustainable water source

- Re-development of the natural water sources, including protecting the existing source and looking at other options to expand supply using a reticulated system of small bore pipe. However, this will not build reliance on pumping, in line with the new rural WASH policy, and also based on past experience of the communities with pumping and sourcing fuel. According to the rural WASH policy the main choice of systems should be gravity fed, and excessive costs such as fuel for pumps are not sustainable options.
- Restoration of shallow hand dug wells, which are used for bathing and washing, but during dry periods are used for drinking. Despite this the water quality is poor and saline, and is used by roaming village animals as well. These hand dug wells will be protected with correct simple technologies such as culvert and concrete slabs. They will be rehabilitated with hand pump systems to protect the water, and community rules established regarding their use to try and avoid them being used for drinking – contingent on provision of alternative sources of safe freshwater.

3. Developing Groundwater Management Protocols

- A groundwater assessment will be conducted to assist with the identification of a new safe freshwater source. The hydrogeology of raised atolls often results in safe clean water stores underground, but also a high propensity for mixing of fresh and saline water in cases of excessive extraction. As the island is in a frequent earthquake zone, and experiences regular cyclones it poses challenges with choosing permanent or semi-permanent solutions. If a source is located that can be sustainably developed the project will invest in this to help build resilience into the communities supply options.

4. Improving sanitation conditions

- Sanitation – is a challenge on Makira. The traditional practice of using the beach needs to be addressed in order to improve sanitation conditions, although. it is also not clear if the use of the beach is affecting the water quality, when they rely on rainwater safely stored in tanks. To support and build adaptation into the UNICEF project 'Building Human Development: Improving WASH in the Solomon Islands' which will also support WASH interventions in Makira focussing on health clinics and schools. As with other sites, SIWSAP will provide additional support to try and improve sanitation provision and protect what freshwater resources do exist. The project will support UNICEF sanitation interventions through supporting the:
 1. Creation of a local hygiene campaign to alert people to the risks around common WASH disease, etc – working with UNICEF, MHMS-EHD and the relevant Health Promotion Unit from the main island.
 2. Through consultation, and with UNICEF, selection of willing families to trial new latrines, including composting toilets, funded by the project, as 'demonstrations' of households willing to 'try' latrines. This will include a series of monitoring activities with the families and communities involved where pros and cons of the latrines are openly discussed within the communities. The aim is to use these pioneering families and households (including government offices and small businesses) to be 'live' monitors for toilet use, who report back on a regular basis to the wider community and town on their perspectives regarding latrine use relative to open defecation on the beach/mangroves. This way, transparent perspectives are presented to the town and communities- and they can therefore make the choice about what they want to do for their 'sanitation future'. The actual design of the latrines will be developed during the WSCAAR planning process.

174. **Pilot #4: Maanaoba, Malaita Province** – The PPG focused on the pilot site selected during the Inception workshop at Ferafula village within Maanaoba Island. The population of Ferafa'alu community in Manaoba Island is 213 where adult females are 32 (15%) and males (13%) whilst youths is 153 (72%). The island has a similar geology to the previous site Santa Catalina, as a raised coral atoll. Consequently the adaptation challenges are similar in terms of adequate rainwater storage, very little surface water availability apart from some hand dug wells close to the coastline which are saline, and only used for batching and washing. The village of Ferafula also suffers from heavy coastal erosion due to storms and frequent cyclone damage during the season. Sanitation practices are open defecation on the beach. Two pour flush latrines do exist and one pit latrine. Utilising the proposed project strategy of developing the WS-CCAR Plans to identify the adaptation needs for site water management, the following proposed activities will be reviewed and improved during the inception phase of the project, and then implemented. Five main areas are to be considered under this pilot project. During full implementation of the project it is proposed that a WSCAAR Plan is develop not just for Ferafula, but also for the entire island of Maanaoba..

175. Interventions at Ferafula would therefore be limited to:

1. Strategic Rainwater Storage

- Rainwater harvesting restoration and development- there is sensible use of rainwater tanks in the village. The project will restore the sensible gravity fed rainwater harvesting system that needs restoring and technical upgrading to provide easier free flow abundance. Given the small population, rainwater tanks will be provided to all families including strategic community or shared storage tanks, with their own roof catchments. Correct sizing of roof equipment and other materials and distribution will take place under the development of the WSCCAR plans. The school roofing should also be assessed for capturing water and tanks fitted as freshwater storage for the school. The estimated cost of servicing and provision of tanks is \$ 90,000.

2. Sourcing/rehabilitating sustainable water source

- Development of the natural spring (Faisafa), including assessing the yield and water quality of the spring/sink hole, and securing access with landowners to use the source for the village. The source would then need to be developed for use using small bore pipe, with the aim of gravity supply. According to the rural WASH policy the main choice of systems should be gravity fed, and excessive costs such as fuel for pumps are not sustainable options.
- Restoration of shallow hand dug wells are used for bathing and washing. Despite this the water quality is poor and saline, and is used by roaming village animals as well. These hand dug wells will be protected with correct simple technologies such as culvert and concrete slabs. They will be rehabilitated with hand pump systems to protect the water, and community rules established regarding their use to try and avoid them being used for drinking.

3. Developing Groundwater Management Protocols

- A groundwater assessment is required for the entire island of Maanaoba using the correct technical interventions to assist with the identification of new safe freshwater sources. The size of the island, and the WSCAAR planning process will be useful to better understand how climate change is affecting the entire island system. From this a better understanding of the need to protect the watershed and natural wells/sink holes are key water resources for the island can be better understood. A hydrogeological survey would be required for the entire island, but if the sink holes are a valid resource, some form of protection zone and fund would need to be established

4. Improving sanitation conditions

- Sanitation – The traditional practice of using the beach will be addressed. As with other sites, SIWSAP will provide additional support to try and improve sanitation provision and protect what freshwater resources do exist. The project will support sanitation interventions through supporting the:
 1. Creation of a local hygiene campaign to alert people to the risks around common WASH disease, etc – working with UNICEF, MHMS-EHD and the relevant Health Promotion Unit from the main island.
 2. Through consultation, and with selection of willing families to trial new latrines, including dry composting toilets funded by the project, as ‘demonstrations’ of households willing to ‘try’ latrines. This will include a series of monitoring activities with the families and communities involved where pros and cons of the latrines are openly discussed within the communities. The aim is to use these pioneering families and households (including government offices and small businesses) to be ‘live’ monitors for toilet use, who report back on a regular basis to the wider community and town on their perspectives regarding latrine use relative to open defecation on the beach/mangroves. This way, transparent perspectives are presented to the town and communities- and they can therefore make the choice about what they want to do for their ‘sanitation future’. The actual design of the latrines will be developed during the WSCAAR planning process.
 3. Given the small scale of Ferafula Village within the Manamba Island, it is also recommended that the sanitation campaign is targeted at the entire island of 3,000 people, using interventions at Ferafula and other sites to mobilise behaviour change.

176. **Pilot #5: Tuwo, Temotu Province** – The entire Province of Temotu only has 5,600 people, and the Tuwo community is estimate to have a population of 1,016 people of which 162 (16%) are adult males and 172 (17%) are adult females. Youth’s population is 682 or 67% of the total population. It is an atoll island, and therefore has limited options in water collection and storage, and faces other vulnerabilities from sea level rise, storms, and cyclones. Most of the water resources are rainwater collected in tanks, with some shallow freshwater available but overuse of this renders the wells saline, and therefore unfit for drinking water, but suitable for washing and bathing. Sanitation consists of 7 pour flush latrines, or the beach for the majority of the population Interventions at this pilot site will consist of:

1. Strategic Rainwater Storage

- Rainwater harvesting restoration and development- there is sensible use of rainwater tanks are widely used in the village, and previous support has been offered by the rural Development Programme. However, there is community tension over the allocation of tanks, which suggests they were not distributed equitably. SIWSAP will assess this situation and based on the WSCAAR plans, invest in tanks to ensure equitable distribution and access to water resources. Furthermore, the project will invest in strategic shared storage for the entire community, using tanks with their own roofs. The reason for this is that some of the communities use traditional housing with sago leaves, which are not effective at collecting rainwater. Correct sizing of roof equipment and other materials and distribution will take place under the development of the WSCCAR plans. The school roofing will also be assessed for capturing water and tanks fitted as freshwater storage for the school. The estimated cost of rainwater harvesting restoration and development in Tuwo is \$83,000.

2. Sourcing/rehabilitating sustainable water source

- Restoration of shallow hand dug wells are used for bathing and washing. Despite this the water quality is poor and saline, and is used by roaming village animals as well. These hand dug wells need protecting with correct simple technologies such as culvert and concrete slabs. They will be rehabilitated with hand pump systems to protect the water, and community rules established regarding their use to try and avoid them being used for drinking.

3. Developing of Groundwater Management Protocols

- A groundwater assessment is required for the entire island of Temotu using the correct technical interventions to assist with the identification of a new safe freshwater source – or at least to see if one can be developed with a sustainable pumping rate. The size of the island, and the WSCAAR planning process will be useful to better understand how climate change is affecting the entire island system. From this a better understanding of the need to protect the watershed and natural wells/sink holes are key water resources for the island can be better understood and shared across the province, informing the development of the overall Provincial Plan on water and adaptation.

4. Improving sanitation conditions

- Sanitation – As with other sites, SIWSAP will provide additional support to improve sanitation provision and protect what freshwater resources do exist. The project will support sanitation interventions through supporting the
 1. Creation of a local hygiene campaign to alert people to the risks around common WASH disease, etc – working with UNICEF, MHMS-EHD and the relevant Health Promotion Unit from the main island.
 2. Through consultation, and with selection of willing families to trial new latrines, funded by the project, as ‘demonstrations’ of households willing to ‘try’ latrines. This will include a series of monitoring activities with the families and communities involved where pros and cons of the latrines are openly discussed within the communities. The aim is to use these pioneering families and households (including government offices and small businesses) to be ‘live’ monitors for toilet use, who report back on a regular basis to the wider community and town on their perspectives regarding latrine use relative to open defecation on the beach/mangroves. This way, transparent perspectives are presented to the town and communities- and they can therefore make the choice about what they want to do for their ‘sanitation future’. The actual design of the latrines will be developed during the WSCAAR planning process.

177. **Pilot #6: Gizo Township, Western Province** – Gizo is the capital of the Western Province. It is a relatively small when compared to the surrounding islands; the island is 11 km long and 5 km wide, with a summit elevation of 180m (Maringe Hill). With a population of approximately 7,177 (2009 census), it is the second largest town in the country with an urban population of 3,547 [2009 census]. The number of males is approximately 3,802 (53%) and females are estimated at 3,375 (47%).

178. Gizo Water Supply system is one of the old systems that was established during the colonial government. There had been several studies commissioned to assess various sources and option including ground water. Gizo Island also has several streams and springs. Leoko Stream situated on the western part of the island was also studied and was included with an automatic water level monitoring recorder. The mean flow was measured to be 6 litres per second, although there is no weather monitoring station in Gizo, but there is a monitoring station in Munda on New Georgia Island with annual rainfall of 4230 mm in 2012.

179. In terms of vulnerability, the watersheds of Gizo Island are highly vulnerable to extreme drought periods. The island is well known for running short of water. Gizo water supply is problematic and had been affected by the climatic variation and conditions. Residents have had to resort to using hand dug wells at times. However, almost all houses with roofing iron collect water from rainfall using tanks. Rainwater harvesting is a common practice in Gizo Township because the actual water supply system does not work very well as it runs dry during dry periods, and illegal off takes and other challenges, such as rural urban challenges over water, and vandalism, have left a good water system not fully functioning. SIWSAP activities at Gizo will include:

1. Strategic Rainwater Storage

- A rainwater harvesting survey of the entire town is required. Some tanks will not contain clean water, and there is a need for some additional storage. Communal back-up storage will be developed in communal buildings, and extended in areas with large roofs, such as churches. In many places guttering is required, and training in maintaining tanks for clean water provision. An estimated budget of \$50,000 will be utilized to rehabilitate existing rainwater tanks and roofing systems.

2. Sourcing/rehabilitating sustainable water source

- Survey of water supply system - Utilising the proposed project strategy of developing the WS-CCAR Plans to identify the adaptation needs for the town. This will incorporate a survey of the water supply system. As a core growth area of the country, and an annual population growth rate nearing 4%, Gizo town is a key showcase pilot location for the SIWSAP project to demonstrate the adaptation response approach.
- Protection of existing source and development of a new additional water source at Leoko and Tirokogu - a payment for ecosystem services scheme, or similar mechanism needs to be developed to protect the existing watershed above the sources located in the forested valleys of Gizo Island. A new source, close to the existing one also needs to be surveyed and assessed as a suitable source of water. A feasibility study will be prepared with the Provincial governments support to develop the other source at Tirokogu.
- Repairs and monitoring: of the existing system. Vandalised pipes will be replaced to expand capacity to the existing network system, and the old reservoir will be rehabilitated, including the development of a protection zone around the reservoir to improve the resilience of the system through providing additional storage and capacity. Sand filters and other water quality equipment will need to be replaced.
- To match the possible development of a new source, the project will look to partner with Solomon Water (formerly SIWA) in developing sustainable water sources for Gizo. The cost of sourcing and/or rehabilitating sustainable water sources in Gizo is estimated at \$ 90,000.

3. Developing Groundwater Management Protocols

- Protocols in which water can be managed and accessed more equitably, particularly during water shortage situations will be discussed and designed through community consultation processes. The consultations will take place with the Gilbertese villages that currently experiencing governance issues related to water access. Equitable access of water is particularly important in ensuring that marginal groups of the community such as women, children, and the elderly may access water even during periods of water scarcity. Therefore, a detailed survey of who uses what water, and can they be connected properly before the water pipes enter the town (and become a municipal responsibility) will be conducted to strengthen water resilience through improved governance..

4. Improving sanitation conditions

In line with other pilot sites, SIWSAP will build upon the WASH awareness campaign implemented by UNICEF and MHMS-EHD to mobilize a Province wide sanitation and hygiene 'campaign' based in Gizo for all the

Western Province. Through working with UNICEF, MHMS-EHD and the relevant Health Promotion Unit the project will alert people to the risks around common WASH disease.

Output 2.2. *Community-based Climate Early Warning and Disaster Preparedness Information System tailored for water resources management developed and implemented in targeted areas*

180. An Early Warning System (EWS) represents the set of capacities needed to generate and disseminate timely and meaningful warning information that enables at-risk individuals, communities and organizations to prepare and act appropriately; most importantly in sufficient time to reduce harm or loss ²⁸. Early, to signify ‘prior’ to the arrival of a ‘hazard or threat’ — while there is still time to respond and therefore reduce potential harm or loss, or prevent a disaster. In this case, a warning is the message (using signs, words, sounds or images) that announces an imminent danger. This ‘trigger’ initiates an ordered and often standardized compilation of elements – at its most complex, an end-to-end warning system is designed to connect those who need to hear messages, to others who compile and track hazard information and compile warning messages or other triggers.
181. Water Resource assessments conducted in the pilot sites during the PPG phase (Annex 5) indicate that the major “hazard” to water resilience in the SIWSAP project sites is the lack of rain for a prolonged period (normally for more than two months). As most community-level water resources depend on rainwater, an early warning system that informs communities of projected dry spells (lack of rain) so that they can prepare well in advance through water conservation efforts has been identified as an effective approach to deal with existing water resource constraints, which would pose even further limitations to communities in the future due to climate change. An institutional analysis water sector resilience conducted in the PPG phase indicates that while some communities may already have community level water management rules that are enacted during periods of water scarcity. Building on existing local systems and knowledge, the SIWSAP project intends to develop both an effective community-based climate early warning and disaster preparedness information system for water resource management that is both “top-down” and “bottom-up”.
182. *Participatory Water Resource EWS Design* process will be undertaken to develop both “top-down” and “bottom-up” EWS in the 6 pilot sites engaging all relevant stakeholders who will be receiving and sending information related to water resource scarcity. The “top-down” EWS will focus on transmitting information related to dry spells and prolong period without lack of rainfall from the National Meteorological Service to the Provinces (i.e. Provincial Secretary), sub-provincial authorities (i.e. Provincial Ward Members), communities, and eventually to households and individuals. Water resource assessment conducted during the PPG phase found that provinces and communities regard period of more than 2 months without rain as a “disaster/drought” as communities try to develop water sources and storage facilities with capacities to supply water to their communities for 2 months (Annex 5). Based on the final assessment of water resource vulnerabilities and capacities, sufficient lead time that is required for the National Meteorological Service to release climate projection information related to rainfall and/or water scarcity will be discussed in the design phase²⁹.
183. Similarly a “bottom-up” EWS will be designed through a participatory approach. While rainfall information from National Meteorological Service would provide a scientific bases to trigger the water resource EWS, not all drought can be predicted accurately and timely. Furthermore, with climate change, extreme events will most likely be more frequent and less predictable. Therefore, in order to enhance water resource resilience, in addition to the “top-down” EWS based on scientific information, an alternative “bottom-up” water resource EWS would also be effective, which will be based on community-level monitoring of water storage levels. Once water storage levels goes below a certain threshold, this too may trigger a water resource EWS that would enact certain water management rules agreed upon by the community groups and/or group of households sharing the water resources.
184. After participatory community designs of both the “top-down” and “bottom-up” water resource EWS are conducted in the 6 pilot sites, *detail designs* will be developed that would inform the specific technologies and sites required for the EWS hardware software. Based on the detail design, the *EWS systems will be procured, installed and tested*. Simultaneously *trainings* of those responsible to manage the EWS at the

²⁸ UNISDR, 2009.

²⁹ The project will build upon existing efforts in the Solomon Island on disaster early warning such as the support from JICA provided to the NDMO.

national, provincial, and community levels will be conducted. This will also be coupled with a broader training of EWS users (i.e. community members) who are required to respond appropriately after receiving the water resource early warning messages. Therefore, training at the pilot sites will engage various stakeholders including appropriate disaster (extreme water shortage) management officers and other agencies including the Solomon Islands Red Cross and importantly Church networks³⁰, PEHD officers, and MHMS. Community-level water resource conservation techniques such as the community water management rules will be introduced and established through these trainings.

185. *Communicating and Replication* – Water management EWS systems will be mobilized at replication sites by the Provincial Officers. Tools to facilitate replication may include a radio programme that explains the development process of the Water management EWS. The programme will focus on water risks and hazards, both hazards such as floods and storms, but also slower onset problems such as drought and pollution of water sources. This programme will be shared nationwide over the course of the project. A critical element of disaster risk planning is communication, between formal and increasingly informal ‘agencies’ involved – relying solely on national response mechanism is costly and a lengthy process, and cripples government temporarily as all resources are re-allocated to response mechanisms. This has an immediate impact on GDP and other sectors. The National Development Strategy highlights the need for better ‘models of good practice for disaster preparedness and response...and the need to improve communications and coordination with outer island communities’³¹. Communicating how communities identified the hazards, and then what they did to mitigate against them and better prepare will be the core focus of the radio programme

186. Processes, data, and information collected over the course of developing the EWS and mobilizing it at the pilot sites will be captured and documented by the PMU (including through the use of video). This information will be shared with the Red Cross and NDMO for disaster risk reduction and preparedness learning purposes, but also with RWSS and MMEME-WRD to better understand community hazards and their response approaches. This information will be used to guide more appropriate interventions in villages and towns in the future, including the impacts on surface and groundwater resources.

Table 4: Summary of Main Activities for Outcome 2

Output 2.1. *Community-level WS-CCA soft and concrete measures implemented to improve sanitation and water supply in times of scarcity, that may include, but not limited to: diversification of water sources; protection and restoration of ecosystems that protect critical water resources; improvements in water-use efficiency and overall demand-side management; use of innovative instruments; building on traditional knowledge; protection of freshwater lens through better sanitation practices in small islands (e.g., composting toilets) (in about 6 sites)*

2.1.1 Six pilots sites across the country to enhance the capacity to adopt/ maintain a variety of different interventions, guided by the WSCCAR plans to frame water adaptation interventions, including:

- Strategic rainwater storage options
- Sourcing/development of new water sources
- Protecting existing sources, include ecosystem/watersheds using payment protection schemes (i.e. payment for ecosystem services)
- Groundwater management improvement and training, including protocol development
- Groundwater surveys/assessments
- Rehabilitation of existing water sources
- Rehabilitation of existing systems, including reservoirs and filters
- Sanitation campaigns and introduction of trial latrines for community assessment and review (Province wide campaigns for Western, and Temotu)
- Rehabilitation of existing systems, including reservoirs and filters

Output 2.2. *Community-based Climate Early Warning (EWS) and Disaster Preparedness Information*

³⁰ Identified as an invaluable network, often overlooked and not adequately integrated into risk reduction planning and response. See Gero, A, Fletcher, S, Rumsey, M, Thiessen, J, Kuruppu, N, Buchan, J, Daly, J, Willetts, J (2013) .*Disaster response and climate change in the Pacific*, National Climate Change Adaptation Research Facility, Gold Coast, pp. 202.

³¹ National Development Strategy, Objective 7: Effectively Respond to Climate Change and Manage the Environment and Risks of Natural Disasters.

System tailored for water resources management developed and implemented in targeted areas

- 2.2.1 Participatory design of top-down and bottom-up Water Resource EWS in 6 pilot sites
- 2.2.2 Development of detail design of the EWS in 6 pilot sites
- 2.2.3 Procurement, installation, and system testing of EWS in 6 pilot sites
- 2.2.4 Development and dissemination of communication materials (i.e. radio programme and videos) of how to establish water resource EWS
- 2.2.5 Replication of EWS establishment efforts in selected sites

Outcome 3. Investments in cost-effective and adaptive water management interventions and technology transfer

Co-financing for Outcome 3*:

Government of the Solomon Islands:	\$	1,592,462
MDPAC (EU EDF10 Sector Support)	\$	7,770,000
MDPAC (AusAID Sector Support)	\$	5,910,000
<hr/>		
Total Co-financing:	\$	15,272,462
LDCF Project Grant Requested:	\$	3,112,359
Total for Outcome 3:	\$	18,384,821

* Government: National Government multiyear development budget for Water Resources Sector
EU EDF10 Sector Support: Improving Governance and Access to WASH for Rural People
AusAID Sector Support: Solomon Islands Access to Clean Water & Sanitation Initiative (SIACWSI)

Baseline (Without LDCF):

187. Water, Sanitation, and Hygiene (WASH) statistics for the overall Solomon Islands indicate there is a wide and relatively good coverage of water supply (although this could be improved), but sanitation remains very low when compared regionally and internationally. Progress towards reaching the Millennium Development Goals (MDGs) overall shows good progress for primary education and maternal and child mortality. However, coverage for rural water supply and sanitation remains low. Previous tensions, weather conditions, and an expanding population have put pressure on the water supply and sanitation services across the country. 71% of the households across the country do not have improved sanitation facilities, and around 30% do not have improved access to safe drinking water. For rural areas these numbers are lower with over 80% having no access to improved sanitation facilities, and almost 40% of people do not have improved access to safe drinking water. For a country where 80% of the population are classed as rural these are sobering statistics.
188. Equally, the Rural Water Supply and Sanitation Policy (draft, July 2013) vision states that: 'All Solomon Islanders with easy access to sufficient quantity and quality of water, appropriate sanitation, and living in a safe and hygienic environment', and recognizes that the conservation and protection of water resources is of great importance to the Solomon Islands. This is due to increasing population pressures, logging and other activities that threaten water catchment areas, with knock-on detrimental effects on livelihoods and health. The policy also recognizes the ongoing Integrated Water Resource Management approach, requiring collaboration and coordination with all sectors including the rural water supply, sanitation and hygiene agencies.
189. Furthermore, the policy specifically recognizes climate change impacts, and the need for close institutional collaboration, to adopt a flexible approach to technical design and construction standards, to make wider use of the opportunity to work with and engage community capacities to better understand and leverage local climate change knowledge and disaster events and impacts, and to 'build-in' greater understanding of climate change in providing rural WASH services. However, without support for this process, and the development of greater adaptive capacity, there is a risk that many of the water interventions will continue along the business-as-usual model. This is critically important, given there are already suggestions that the Government has not paid enough attention to water supply and sanitation requirements, and the integration with wider water resource management historically. These findings are

documented in the AusAID Rural WASH Transition Plan, which focuses on the need to adjust the way water is managed in country and the need to improve governance of the resource, and sanitation. The Plan provides key baseline information regarding the need for improved leadership, planning, monitoring of interventions, and the urgent need for advocacy and sanitation and hygiene campaigns across the country. The lack of capacity for community engagement is a major hindrance to development progress. The plan also highlights climate threats to interventions, but does not provide a further analysis.

Adaptation Alternative:

190. Building on the efforts under Outcome 2 to enhance existing water facilities and management capacities to implement provincial and community-level WS-CCAR plans developed under Outcome 1, Outcome 3 will focus on building additional facilities' capacities and awareness to further strengthen climate resilience in six pilot sites. This will be done through four types of interventions, including **1) provision of additional rainwater storage, 2) developing new surface water sources such as from river systems, 3) development of new water sources, such as from wells, and 4) preparing for extreme water scarcity events through provision of specialized equipment such as desalination and water treatment systems.** Project's targeted investments will mobilise changes in the way water is managed nationally. Through investing in sites driven by community design, implementation, and maintenance and supporting MHMS-RWSS in their interventions, the project will change the approach taken to develop water resources. The NAPA has identified that better information is needed to help understand the risks to different sectors – for water this is critical as both a lifeline resource, but also for other sectors. The lack of data and information hinders the ability to adequately cost, resource and plan responses. SIWSAP aims to adjust that through providing climate information, and using this to influence water and other sectoral investments.
191. Interventions designed and implemented through the pilots will be integrated into partner projects to improve the sustainability of interventions. Many water projects, as discovered during the PPG, do not take into account adaptation, and suffer from poor sustainability and operation and maintenance. SIWSAP interventions aim to change that, and through national and Provincial communications share information on effective adaptation responses to feed into sectoral reform and budget development.
192. Within the Solomon Islands moves are currently underway to provide for a National Water and Sanitation Sector Plan, driven forward by the Cabinet approved National Inter-sectoral Water Coordination Committee (June, 2013). This process has been supported by the GEF funded Regional Pacific IWRM Project, initially co-financed by the EU Water Initiative IWRM National Planning Programme. The proposed project interventions will feed valuable lessons into the application of this plan, which does primarily take note of climate change impacts due to the influence of SIWSAP during the PPG phase.
193. SIWSAP will provide pilot site lessons to inform the policy revision process and the implementation of the National Water and Sanitation Sector plan. Uniquely, compared to other projects focused on WATSAN targets, and impact-specific interventions, this project will provide for lesson learning on the ground, the development of unique support and interventions to existing projects for adaptation needs, working with co-financing support from the EU, AusAID, and UNICEF, and the collection of further knowledge and information, including investment in data collection and capacity development.

Output 3.1. *Strategic investments in water infrastructure in target areas, including but not limited to: new household and communal water storage systems and infrastructure provision of up to 4 portablewater filtration and/or desalination systems for sharing across communities in times of extreme water scarcity.*

194. Outcome 3 will further engage community stakeholders to design and implement a total of 20 new sustainable and effective climate-resilient water management approaches that build additional water facilities and management capacities across the 6 pilot sites. Similar to interventions under Outcome 2, Outcome 3 will deliver on provincial and community-level priorities highlighted within the WS CCAR Plans through active demonstration of measures and approaches in the Plans.
195. Based on data collected and assessments conducted during the PPG phase, the SIWSAP will implement interventions categorized in the following four broad categories including: **1) increasing**

rainwater storage, 2) cultivating new river water sources, 3) development of new water sources including small-scale reservoirs and wells, and 4) preparing for extreme water scarcity events.

196. Below Table illustrates the proposed interventions to be supported through SIWSAP in each of the pilot sites that have been identified as measures to build additional water management capacities.

Table 5: Proposed Outcome 3 Interventions in Pilot Sites

Province	Community	Intervention Type	Proposed Intervention	Estimated Cost US\$	Estimated Beneficiaries
Choisuel	Taro	1) Rain	Construct a Rainwater storage using roof catchment	70,000	1423
		2) River	Feasibility Study of Water supply from Mainland River	55,000	
		4) Disaster preparedness	Purchase of portable water system	160,000	
Renbel	Tingoa	3) Well	Development of Natural Wells	90,000	543
		4) Disaster preparedness	Purchase of portable water system	160,000	
Makira Ulawa	Santa Catalina	3) Well	Development of the identified natural well	50,000	1304
		1) Rain	Provision of additional storage tanks with roof catchment	55,000	
		4) Disaster preparedness	Purchase of portable water system	160,000	
Malaita	Manaoba	3) Well	Development of Natural Wells	120,000	213
		4) Disaster preparedness	Purchase of portable water system	160,000	
Temotu	Tuwo	3) Well	Redevelopment and development of Wells	80,000	1016
		1) Rain	Additional Storage Tanks and Shed for Roof Catchment	90,000	
		4) Disaster preparedness	Installation of portable water system	160,000	
Western	Gizo	2) River	Construction of Storage Tanks at Government Building	60,000	3802
		2) River	Development of Tirokogu stream	80,000	
		2) River	Feasibility study of reticulation system	60,000	
		2) River	Construction of water reticulation system	400,000	
		4) Disaster preparedness	Installation of portable water system	160,000	
TOTAL				2,170,000	

197. Although proposed interventions are based on stakeholder consultations and assessments conducted in pilot sites during the PPG phase, during the project inception phase, all pilot level interventions will be discussed and be approved by the Provincial Administrations, to ensure that project interventions are effective and sustainable and do not duplicate existing efforts or become an additional burden to the Provincial Government. One aim of the project is to influence Provincial budgets to mobilize the Provincial Water Adaptation Plans. However, it is not to add additional burden to budgets for water supply and sanitation schemes where communities have not accepted responsibilities for maintenance of SIWSAP investments. This is in line with the rural WASH policy (June, 2013).

198. Further investments will be made with the national water sector: the rural WASH programme in MHMS-EHD, and MMERE-WRD. A joint review of their workplans will start at the end of year 1 of the project to identify where SIWSAP can add adaptation value. With EU and AusAID funds (under SIACSWI) not programmed at the time of the PPG, lessons from SIWSAP pilot sites, and from other programmes such as the World Bank funded Rural Development Program will be used to support a joint planning process where service providers, such as NGOs and private businesses, under contract to the MHMS-RWSS will work with SIWSAP to mainstream adaptation interventions into the projects proposed. Adaptation interventions will be financed by this project. This approach will help (i) to operationalise priorities identified in the NAPA and NDS from national, to Provincial – to community level; (ii) strengthen the planning of interventions for water supply and sanitation in-line with new national policies and plans; and (iii) raise awareness concerning the need to include adaptation approaches in infrastructure and water supply projects to help maintain the lifetime of investments and build resilience at community level. These interventions will become a core baseline of adaptation interventions for future investments to learn from.
199. The project contains a strong learning structure, and similar to Outcome 2, interventions will be coupled by participatory design as well as trainings to develop effective community-management and maintenance mechanisms.
200. Equally, reviewing the regional UNDP-GEF Pacific IWRM ‘lesson learning’ and other Pacific IWRM project Steering Committee documents³², (which is a project that already builds on many regional lessons learned over the last ten years as part of its project design), stakeholder engagement and technical support stand out as key areas requiring constant support across national demonstration project management units Pacific wide. Despite this, the lessons learned stories from the regional IWRM project indicate great success when focusing and engaging with stakeholders, but that project management remains a constant challenge. This project will build capacity throughout the project with the addition of a series of Provincial Officers – embedded at the Provincial scale to work with the government and communities, NGOs and networks, to support project interventions, and to support MHMS-RWSS in looking at adaptation options when developing new sites.
201. Project outcomes are designed to build incremental learning and capacity, from demonstration and replication to strategic investments, based on initial project learning, and assessment of gaps in knowledge and understanding by the PMU. This learning will be taken to planning and policy levels at the Provincial to National level, feeding in vital lessons from Provincial on-the-ground demonstration, directly opposite to nationally determined and rolled out project approaches.
202. The November 2013 draft of the National Water and Sanitation Implementation Plan identified seven challenges for the plan to address. All of these seven areas will be supported by SIWSAP interventions, notably number 7 which focuses on climate extremes, disasters and climate change. SIWSAP will mobilize the plan and support the mainstreaming of adaptation across the multiple sectors. Under Outcome 4, many of the governance challenges will be tackled including the lack of information flow between national government agencies, and the lack of coordination and monitoring.
203. Capacity support will be required to support the roll-out of projects. The PMU will, with MMERE-WRD and MHMS-RWSS, develop appropriate partnerships with CROP Agencies and other regionally based organizations with the necessary skill base to provide training services for government staff and communities on different technical subjects such as: rainwater harvesting assessments, groundwater assessments, ecosystem based adaptation, watershed protection, water source management and development, monitoring systems, rainwater tank construction and maintenance, water quality testing, development of operation and maintenance contracts for communities to follow, with O&M monitoring developed to improve reporting on systems status, water quality testing,
204. **Procurement of Relief and Communications Equipment.** There is a lack of available water security equipment at the Provincial level. The Solomon Islands Red Cross have highlighted the need for further portable water filtration units, the need for additional strategic freshwater storage options at certain locations during disaster relief periods, and improved communications on Provincial situations and needs during disasters. The project will therefore establish a procurement plan with the NDMO for the following equipment, locally available in the Pacific region, scoped out during the PPG phase:
205. Trunz Water System 300. A mobile solar water treatment system complete and ready to deploy. It provides approx. 1,200 Liter of potable water per hour from any non saline water source. Based on

³² SOPAC/GEF/IWRM/RSC.5/7, October, 2013.

radiation levels in the Pacific, this can deliver approximately 12,000 liters of water a day. Six of these systems will be purchased at a cost of \$61,275 each (quote valid 2013).

206. Trunz Brackish System 300. The Brackish Water System is designed to use brackish water to generate freshwater. The filtration and power system is different to the freshwater system, and therefore only 4'500 Liter of clean drinking water can be produced per day. Six of these systems will be purchased by the project at a cost of \$96,490 each (quote valid 2013)

207. These systems have been selected during the design phase because they are cost-effective, with only low operation and lifecycle costs. They are a far less expensive solution compared to diesel powered equipment or bottled water. They are relatively simple to operate with low technical skill requirements, and have low operational costs and maintenance requirements (there are no consumables). The automatic backwashing filters are highly reliable and automatic. Costs for this equipment will include specifically designed trailers to make the systems more maneuverable. In addition to this hardware, satellite phones will be purchased under the project for distribution to Provincial Administrations. Maintenance costs will be covered by the project up to the end of year 3. From year 4 of the project maintenance costs will be integrated into the budget of the communities, Provincial Government. Although these systems are to be placed in the pilot sites, as they are mobile systems, they will also benefit surrounding communities and people during times of water scarcity and disasters as they can be deployed to nearby locations depending on the needs on the ground.

Output 3.2. *Compilation of best practices on applicable technologies for dissemination and replication by project partners with support from the project*

208. The PMU will recruit a local team during the project to specifically deliver knowledge management activities. These activities will include digesting and documenting technical reports and other project related information, including the collected climate change and adaptation relevant information, and 'translating' this into national and provincial relevant outputs – tailored communications products. Service providers could be local NGO's, or for example, journalists and independent communications experts. These will be communication experts and not technical specialists, who often find it difficult to communicate technical issues into common language and therefore communication products designed to influence behavior change. This activity is concerned with taking technical outputs and nationalizing them for a wider range of stakeholders, and to influence wider society. This will include developing news stories for national broadcasting on television. These tasks are often left until the end of projects, and are often time consuming (and therefore not cost-effective) for technical staff to implement.

209. With the support of AusAID co-financing under sector reform support to the rural WASH sector (SIACWSI), the project will also mobilize the use of volunteers under the Australia Volunteers International (AVI) or Pacific Technical Assistance Mission (PACTAM) to bring in additional capacity to the PMU. AusAID already provide support of a similar nature to MHMS-RWSS. Additional support, for a defined timeline (2 years), specifically on climate change adaptation and response measures will be needed to support the PMU in analyzing lessons from the pilot and replication sites. These lessons need to be absorbed, and best practices identified, both at the sites that SIWSAP has direct control over with partners and communities, and at the sites where the project will invest in adaptation responses in addition to other ongoing rural WASH projects (supported by the EU, AusAID, and UNICEF).

210. The skills needed include the ability to technically understand the adaptation elements – the technical challenges, and the difficulties, for example, of sourcing additional surface water over long distances, and to provide recommendations to the use and management of water in this respect. This will take into account rural water supply, sanitation and hygiene interventions but also those associated with irrigation needs, the use of water for farm plots and gardens at the pilot sites. Further outputs will include a better understanding of the implications of the changing climate on surface water flows for irrigation and hydropower generation needs, to support MMERE with their energy mandate, including the opportunity additional flows could present for sustainable hydropower development, particularly at the Provincial level where small hydropower sites could reduce the costs and reliance of fossil fuels.

211. Best Practices will be developed as a series of guidance documents, supported with training videos in English and Pidgin for sharing across Provinces and national agencies. Videos which focus on practical level issues such as looking at alternative water storage options, or developing a community based early warning approach will use pilot and replication sites in the videos – using the Pilot Project Committees to showcase project examples and communities identifying and solving local problems themselves.
212. The adaptation community-of-practice is often distanced from the wider water community at the regional and international level. Yet, it can be argued, the most immediate, and equally long term effects of climate change will be on water supply, either through changes in precipitation or temperature. More examples of dealing with adaptation are required to improve national and global learning and for the design of water and adaptation interventions. SIWSAP will help develop some of this information and experience for sharing at the regional and international level through platforms such as the Adaptation Learning Mechanism, and IW:LEARN. Equally, material such as training courses, training videos, project briefings and experience notes, case studies, science related information of publication standard, will be showcased within the region with the **Pacific IWRM** programme, and the regional **Pacific Adaptation to Climate Change** (PACC) programme. Guidelines on climate proofing water supply and sanitation interventions will be valid for other globally projects such as **the African-Indian Ocean IWRM SIDS** project (<http://www.aio-iwrn.org/>), and the **Integrated Coastal Area and Watershed Management Project (IWCAM)** and its follow on project IW-ECO (<http://iwcam.org/>).
213. Best practices from the project will also be shared at the World Water Forum in South Korea (2015), with high Pacific relevance, and at the Forum in 2018 (venue tbc). In particular, outcomes from the National Water and Adaptation Forum, and the Sanitation Futures camping will be documented and shared with partners to influence future project and programme design. MDPAC will be specifically involved in this process as a member of the Project Board.

Table 6: Summary of Main Activities for Outcome 3

Output 3.1. Strategic investments in water infrastructure in target areas, including but not limited to: new household and communal water storage systems and infrastructure; provision of up to 4 portable water filtration and/or desalination systems for sharing across communities in times of extreme water scarcity.

- 3.1.1 20 water and adaptation interventions identified and designed through a participatory process in the 6 pilot sites
- 3.1.2 Technical design and planning for 20 water and adaptation interventions
- 3.1.3 Procurement, installation, and testing and training
- 3.1.4 Develop and test creative maintenance mechanisms through a participatory process
- 3.1.5 Enhance intervention performance through community-based/indigenous knowledge
- 3.1.6 Adaptation interventions designed and integrated into national and development partner projects focussing on rural WASH
- 3.1.7 Regional partnerships with CROP Agencies and others for training communities and government in relevant subjects specifically at the 20 sites (3.1.1) (i.e. adaptation planning, new WASH approaches, water resource assessments, catchment hydrology and meteorology, DRR, communications)

Output 3.2. Compilation of best practices on applicable technologies for dissemination and replication by project partners with support from the project

- 3.2.1 Recruitment of local communications specialists to develop national products explaining the project, tailoring outputs, developing communications materials to influence behaviour change, and raise awareness (advocacy outputs)
- 3.2.2 Mobilise volunteer(s) and/or civil society organization to support to develop best practice material and guidance – taking technical responses into guidance notes, briefing materials, training videos, national, regional, and international outputs to be developed that build on lessons and experience from SIWSAP and co-financing partner projects

Outcome: 4. Improved governance and knowledge management for CCA in the water sector at the local and national levels

Co-financing for Outcome 4*:

Government of the Solomon Islands:	\$	250,000
MDPAC (EU EDF10 Sector Support)	\$	850,000
MDPAC (AusAID Sector Support)	\$	400,000
UNDP (PGSP)		250,000
<hr/>		
Total Co-financing:	\$	1,750,000
LDCF Project Grant Requested:	\$	750,213
Total for Outcome 4:	\$	2,500,213

* Government: National Government multiyear development budget for Water Resources Sector
EU EDF10 Sector Support: Improving Governance and Access to WASH for Rural People
AusAID Sector Support: Solomon Islands Access to Clean Water & Sanitation Initiative (SIACWSI)

Baseline (Without LDCF):

214. There is a lack of understanding, awareness and information regarding the likely impacts of climate change on different sectors, and where there is information it is not well understood how this will manifest. The quality and supply of water resources in the Solomon Islands is increasingly becoming threatened by development activities such as logging, agriculture and land clearance for subsistence agriculture (which may require irrigation at certain times of the year). Some Provinces find clean surface water, but others suffer from saline intrusion, land use practices that pollute freshwater, inappropriate siting of tanks and sanitation, and lack of operation and maintenance on freshwater systems, such as rainwater tanks but also more technical solutions. Certainly, Makira, Malaita, and Temotu provinces, as discovered during the PPG phase real and concerning water challenges, often running out of water and having to live off coconuts. Yet assessments of water resources and availability are mainly lacking, and have been driven by other economic needs, such as the development of hydropower, or flood warning.
215. Advocacy material on climate change and the impacts on the Solomon Islands is limited at the national level. There is very little sharing of existing information and knowledge beyond those directly involved in collecting information as either development projects or development partner supported interventions through Government agencies. At the Provincial level, anecdotal information exists, but codification and capturing of this knowledge is infrequent. During the PPG Phase it became clear that one of the proposed pilot sites was already experiencing the impacts of climate change through sea level rise and shoreline erosion, compounded by poor land use approaches due to a lack of information and capacity to build resilience. (This site will no longer be included in the project as 90% of the population have relocated.) There is a high possibility
216. The stakeholder analysis also indicates the sporadic nature of climate change interventions, through development partner projects, NGO activities, disaster response approaches and government activities. An attempt to coordinate climate change interventions at the Provincial level is the Choiseul (Province) Integrated Climate Change Programme (CHICHAP). This Programme aims to encourage development partners and national agencies to coordinate and collaborate programmatically across Choiseul the Province to improve efficiency and effectiveness. The programme will focus on food security, although some water interventions are proposed.
217. The new Rural Water Supply and Sanitation Policy (draft, July 2013)³³ defines the development, coordination, management, monitoring, evaluation and implementation of sustainable rural water supply, sanitation and hygiene development activities in the Solomon Islands. This policy changes the institutional architecture designed to respond to water supply and sanitation challenges. It defines new criteria for project interventions, and defines the focus on basic, low-tech solutions – appropriately designed to the local situation and capacities. Where necessary, higher technical interventions should only be provided

³³ The Solomon Islands Rural Water supply, Sanitation, and Hygiene (Rural WASH) Policy, July 2013. DRAFT, v.11.

where the recipients are made aware of, and are able to cover the financial costs of operating and maintaining more complex solutions, noting that this also requires improved technical capacities. The policy provides guidance on appropriate rural water supply approaches, and also for sanitation. This guidance will be used to define some of the activities that SIWSAP will invest in, yet it remains to be seen how the rapid change to the sector will manifest in delivering existing services, let alone take into account climate change complexities, and learn from interventions at the same time. The AusAID Transition Plan raises these issues as key risks to future water sector delivery during the period where institutional change is required, at the same as maintaining delivery of existing, and rapid expansion of water sector interventions.

218. Resilience in practice requires capacity development that allows people to cope with vulnerability and shocks, but which also allows them to move beyond just 'coping'. Adaptation provides the opportunity to support a range of approaches to reduce the impacts of climate change on poverty, health and livelihoods. To build resilience, adaptation to climate change should go beyond planning. Adaptation based on discrete actions that are prioritized, for example on water resources and infrastructure for water supply and sanitation services may miss the often critical need to sustain the institutions and ecosystems which protect and provide water. Focusing on community level water supply infrastructure, without linking this back to water source protection and monitoring may jeopardize the infrastructure investment, and the capacity of the source for future use, especially under a changing climate with longer dry periods, for example. As most impacts of climate change occur primarily through water – in terms of drought, floods, storms, melting glaciers and sea-level rise – water management and water governance provide key entry points for building resilience to climate change³⁴.
219. Equally, donor driven programmes need to better align with national programmes across 'sectors' on water (both resources and watsan), adaptation, disaster risk reduction, and wider governance activities. Integration at the national level, or at individual Provincial level only immediately provides boundaries around project activities and interventions, and therefore often limits learning at the wider multi-Provincial or national scale. Leveraging experience into, from, and within Provinces is required to help address the capacity and resource gaps which are clear, and which manifest themselves in, for example, the national water supply and sanitation statistics.

Adaptation Alternative:

220. New rapid policy developed in the water and sanitation sector is welcome. However, although note is made of climate change it is still a difficult concept to channel into programmes and institutions that have clear mandates on water supply provision for example. The ability to see around the bend - to better understand the possible impacts of climate change is important for future planning and economic growth. The project will develop guidelines, and scientific outputs to help provide government and partners with the evidence base to inform changing practices, including better recognition of climate change impacts at the policy level. Expanding and improving the climate monitoring network and investing in a national diploma in water and adaptation at the national university will build local skills and understanding of climate change.
221. Interventions are expected to significantly improve the water provision situation, and develop and protect strategic water reserves, and will also initiate a process for community identification of disaster risk and costed response plans. A sanitation and adaptation partnership with Tuvalu, a regional leader in eco-sanitation will catalyze action desperately needed in reversing the sanitation trend of increasing numbers of unserved rural people. Tuvalu also lives with sea level rise, salinized shallow groundwater, and the threat of 'king tides'. Large amounts of donor support to Tuvalu over the years, and their recent drought experiences will bring much needed perspectives and knowledge to the Solomon Islands under a collaborative partnership.
222. Mobilising innovative communication approaches, building on national cultural beliefs and networks will help to push the climate change impacts and water resource protection and management message wider than conventional approaches. The use of theatre, radio, television, participatory video and video diaries (focusing on women), rural training centres will provide a catalogue of communication products, tailored for

³⁴ Smith, D.M., and S. Barchiesi. 2009. Environment as infrastructure – resilience to climate change impacts on water through investments in nature. Perspectives Paper prepared for the 5th World Water Forum, Istanbul, Turkey.

different groups, designed to gather information and share experience on adaptation - mobilizing discussions from the national institutional level to the Provinces and communities, and vice-versa.

223. The project will contribute and learn from national interventions, and those at the Provincial level such as the CHICHAP programme, to gather lessons on governance for climate change adaptation across sectors, and from this look at improving the IWRM approach and mainstreaming of IWRM policy principles across sectors, using project learning to influence sectoral policy development and programme implementation. IWRM is a multi-sector approach, and therefore a valuable entry point to raise awareness concerning the climate change impacts on water resources, and the impacts therefore on food security, health services, industrial needs and natural resource management.
224. The project will therefore explicitly add value to ongoing interventions that do not have the capacity to absorb climate change perspectives, for example the transition the rural WASH sector is going through needs greater adaptive capacity support to identify innovative approaches, improve more flexible and forward thinking decision making for water and sanitation solutions, and to ensure lessons are learned to dramatically improve the current water governance approaches and improve resilience.

Output 4.1. Overarching policy and legislation for the water sector that integrates CCA components in IWRM plans drafted and advocated, including guidelines for climate resilient water supply development in vulnerable areas

225. With the advent of the new National Water Resources and Sanitation Policy for the Solomon Islands a policy window is open for SIWSAP to make significant impact to ensure that climate change is integrated within national and local level water sector policies. With Cabinet commitment to improve water resource and sanitation management through the endorsement of the policy, and the development of a National Water and Sanitation Sector Plan, there is a clear opportunity to influence the mobilization of the policy through using the current plan as the entry point. The policy states that climate extremes, disasters and climate change are a challenge to safe water supply and sanitation expansion in the Solomon Islands, and that it also poses a threat to the ecosystems people rely on to capture, store, clean and convey water. The policy classifies climate extremes, disasters and climate change as a high priority policy area which will challenge the mobilization of the sector plan. According to the National Development Strategy, adaptation, and halting ecosystem deterioration are high priority concerns, and restoration of these systems is required to integrate national environmental issues and climate change and vulnerability across all sectors. National Communications to UNFCCC highlight conservation of water systems and identification of alternative ground and surface water sources as adaptation actions.
226. In parallel to the development of the Provincial Water Adaptation Plans, the PMU will collect the current vulnerability mapping, information data, and climate change impacts knowledge (data, reports, project understanding) from partners and agencies. There is a wide range of information available, but in different formats and granularities – some of it funded through development partners and budget/sector support, some of it through project and programmatic funding, and some of it directly with NGO's with no or little overlap with Government. Although the Climate Change Working Group is designed to coordinate the climate change activities at the national level, many of the impacts, learning, and anecdotal evidence occurs at the Provincial level.
227. A knowledge 'clearing house' will be developed with MECDM, NDMO, and MMERE-WRD to better understand the current and predicted climate change impacts on the water resources of the Solomon Islands. A key output under this Outcome will be a scientific published study that, as accurately as possible, predicts the climate change impacts on the water resources of the Solomon Islands. The study will also, moving beyond business-as-usual, make predictions of climate change impacts on water supplies for domestic households in towns, and rural water supply provision. The project will source regional expertise³⁵ to assist with the study, and will inform the implementation of the National Development Strategy through providing information to all sectors.
228. Through the development of collective information on the most vulnerable areas to climate change (which will need to be extracted from those areas vulnerable to disasters alone), and in line with requests in the NAPA, guidelines for climate resilient water supply and sanitation development in vulnerable areas will

³⁵ Including SPC (SOPAC), SPREP, AusAID, and USAID, who are collaborating with NOAA in extending their climate services program, the Pacific Climate Information System.

be developed. Lessons learned from the pilot sites will inform the development of the guidelines, and they will be trialed at the replication sites to ensure they work in practice. The resilience framework will be used to guide the development of the guidance around diversity of options, capital (including human) and innovation required, self-organization and learning – to mobilize the rural WASH policy, and to support the transition of the MHMS-RWSS Unit from a ‘construction and implementing’ and into an agency focused on monitoring, capacity development and support. The guidelines should not be a large cumbersome academic document, but a series of smaller briefing documents prepared with the target audience and users of the guidance in mind, and which refer to the national guidance, standards, and other information under development by MHMS-RWSS. The guidelines will also specifically take into account the need to modify building codes to improve the ability to capture and store clean water, and sanitation requirements.

229. To leverage adaptation thinking into overarching water management approaches, and more integrated water management approaches using IWRM principles the following scaling-up approach will be implemented by the project:

Discourse: A national level **Water and Adaptation Forum** will take place at the beginning of Year 2 of the project (therefore implemented for 3 years). This will involve all relevant agencies, the communities and townships involved in the pilot projects, current replication sites identified, relevant Provincial agencies and stakeholders, including private sector suppliers, and National government agencies. External support and participants will also be invited where identified. Brief Terms of Reference for this Forum are provided in Annex 7.

Consensus Building: One of the aims of the National Forum, and a key output from the Forum will be the development of guiding adaptation principles, agreed between different sectors, based on learning from the UNDP-GEF PACC project, and the vulnerability assessments from the pilot sites. The aim is to use the Forum to help raise awareness to adaptation needs and vulnerability concerns, and to promote the mobilisation of the National Climate Change Policy across multiple sectors. Working closely with the Climate Change Working Group (CCWG) the Forum will galvanise support for SIWSAP and wider adaptation approaches. The project will demonstrate its initial vulnerability findings at the Forum.

Policy Framing: With the development of a new Rural Water Supply and Sanitation Policy and a new Water Sector and Sanitation Plan, there is an official opportunity to review these policies, together with the National Climate Change Policy (2012-2017), and Provincial Plans to ensure that there is alignment in approaches and recommendations, and that learning is included in the cycle of policy formulation, implementation, and review. SIWSAP will end during 2018, so the lessons from the project on vulnerability and response action are vital to feed into any future National Climate Change Policy update³⁶

Joint Action: Designed to meet water and climate change policy goals, SIWSAP will develop a series of guidelines targeted at improving the resilience of rural water supply and sanitation interventions (working with MHMS-EHD), wider water management interventions such as flood protection, watershed management and water source protection including groundwater (working with MMERE-WRD), and other relevant agencies to provide recommendations for building codes, town planning, community and village level information (on rainwater harvesting experience for example).

230. The national level Water and Adaptation Forum will also provide the opportunity for training – and to train trainers to roll out learning gained from across projects presented at the Forum. At the end of the project, the final Forum funded by SIWSAP, a participatory evaluation of the Forum for the previous years will decide on the usefulness of the event, and make a decision about holding further events in the future funded through the national budget. In preparation for the final Forum a climate expenditure review and assessment will also be presented to indicate progress at influencing sectors and in sourcing funds to mobilize the NAPA, and to identify where there are still gaps and what further actions are required.

³⁶ The current Climate Change Policy timeline runs to 2017. The Policy itself is broad and all-encompassing and is therefore incredibly ambitious for a country the size of the Solomon Islands, given logistical challenges and the absence of data and information for decision making.

Output 4.2. Institutional and community capacities strengthened toward water-sector CCA formulation, implementation and monitoring at the national and local levels

231. Regional technical capacity will be sourced to assist the Water Resources Division of MMERE to establish **further hydrological monitoring sites** in Makira, Choiseul, and Guadalcanal, and to assist with maintenance of existing sites in Malaita and Isabel. Hydrological monitoring will be expanded to include relevant climatic/meteorological parameters to widen the network of sites used by the Meteorology Division³⁷. Specific skills will be sourced for this, and to assess the current number and range of sites, and type of equipment used by the Solomon Islands Government. CROP agencies and others in the region such as NIWA in New Zealand will be contacted. Sites will be chosen, equipment selected and procured. Installation of equipment will be undertaken with concurrent training and capacity development in installation, operation and maintenance, data collection, interpretation and assimilation.

232. **Sanitation and Adaptation Partnership** established with Pacific Island Countries participating in IWRM including. For example, the Pacific IWRM demonstration project in Tuvalu focuses on sanitation technologies and practices; how they can provide not only a sanitation service, but also protect primary and secondary sources of freshwater from contamination, and are the most appropriate form of sanitation approach on atolls and other islands with limited and unpredictable water supplies (mainly relying on rainfall). Tuvalu has adopted innovative approaches to garner interest, and now support for composting toilets and their use is increasing. It is critical that the Solomon Islands start to address the serious sanitation shortfall, particularly in some specific locations such as the atoll Province of Temotu and other sandy coastal areas. The work in Tuvalu has generated a lot of interest with Tonga constructing demonstration toilets, and Nauru installing composting toilets in schools. Most recently the Tuvalu IWRM team were in the Marshall Islands to trial how effective composting toilets are at reducing septic leakage into Majuro's main groundwater source, the Laura Lens. With increased climate variability and the possibility of more intense droughts there is an urgent need to protect existing freshwater reserves.

233. Using composting toilets will, however, require significant behaviour change – one of the ambitions of the new rural WASH policy (June, 2013). Many Pacific Island countries such as Tuvalu have experience of doing this, with a strong focus on community and engagement, the inclusion of schools, a 'roadshow' and targeted media campaigns good progress has been made³⁸. SIWSAP will mobilise this experience for the Solomon Islands to learn from, adapt as appropriate for Melanesia, and apply over the four years of the project. The partnership will be structured around three areas:

1. **Exchange and Learning** – Pacific IWRM staff selected from the participating Pacific island Country (most likely in Tuvalu) will be supported by SIWSAP for two exchange visits to the Solomon Islands to share sanitation and adaptation experiences. This will include missions to the pilot site in Temotu Province (Tuwo), and other relevant sites in Temotu. The focus of the first visit will be an assessment of the situation to allow the PMU to develop a better baseline understanding of the behaviour change needs, and to identify with communities and Provincial and National stakeholders the most appropriate solutions and activities. Bringing Tuvalu experience to the Solomon Islands will also aid the PMU in developing a broader National Sanitation Campaign in collaboration with national partners (such as UNICEF, MHMS-EHD, etc).
2. **Active Demonstration with Partners** – Through the Kastom Gaden Association (KGA) the Solomon Islands does have experience of using composting toilets, including appropriate designs and construction. There are two composting toilets just outside of Honiara in the KGA nursery

³⁷ The increasing variability associated with climate change as well as extreme weather events require increased **meteorological** capacity to monitor and predict such events. Accurate predictions are needed to provide reliable early warning of impending natural disasters. The present lack of meteorological equipment, coverage of stations, communications equipment and early warning systems and expertise limits the forecasting capacity for disaster management as well as warnings for maritime and air transport. Solomon Islands: National Development Strategy 2011-2020.

³⁸ The film "*Falevatia: A toilet for our future*" shows how composting toilets can help conserve water and minimise threats to the environment, food security and human health in Tuvalu. Tuvalu recently experienced a devastating drought, which resulted in a national emergency and millions of dollars spent on an international relief effort to get water to the small isolated country. The current flush and septic systems used in the atolls are ill suited to Tuvalu's geography and scarce water supplies – often using up to a third of a family's fresh water supply. Furthermore, septic systems are often poorly constructed and much of the waste seeps out polluting fresh shallow groundwater.

which have been in consistent use for over 10 years³⁹. Working with KGA, the Tuvalu sanitation experts, and other relevant partners, the PMU will not only design and mobilise a national campaign, but also establish demonstration sites at schools for composting toilets in the most appropriate locations. There are two main challenges to overcome: (i) using a toilet instead of open defecation in the mangroves or beach; and the (ii) choice of composting toilets as the technology. As part of the national campaign, active demonstration and explanation with communities is vital to start the process of triggering change in behaviour. The successes of Tuvalu need to be leveraged into the Solomon Islands.

3. **Monitoring and Scaling-up** – the National Sanitation Campaign will provide the opportunity for dialogue and exchange with individuals, communities and their leaders, and government. The PMU will work with local partners to use these consultations to collect as much information as possible regarding sanitation usage. There is still little information on the use of sanitation and what demands there are for it – or how to most appropriately create the demand for it. In line with the rural WASH policy, SIWSAP will work with the Rural Water Supply and Sanitation Unit in the MHMS, and the Provincial Environmental Health Divisions (PEHD) to mobilise the rural WASH policy using participatory and innovative approaches – which may require tailoring⁴⁰, including using the consultations as a way to collect information for monitoring purposes. This approach will be designed with the RWSS-MHMS to ensure that it supports and informs the rural WASH policy, and supports the development and implementation of the new Strategic Plan for the rural WASH sector 2014-2018.
234. **Peer-to-Peer Learning Network** – a network will be developed that links the PPG identified pilot sites, and the replication sites together across Provinces. Sites at the Provincial level will be ‘twinned’ in an approach designed to allow communities to work closer together. Resources will be made available through the project and with the Provincial Officers guiding this process, to allow sharing of experience and local skill building directly between sites per Province. They will provide valuable practical experience to inform Provincial authorities. Across the Provinces, communities involved in the project (together with Provincial Authorities) will also be twinned, depending on their activities, to enable them to learn from each other in developing their Water Vulnerability Assessment Plans, and in addressing those vulnerabilities through the Adaptation Response plans and pilot site investments. SIWSAP will actively support this national learning and exchange opportunity – demonstration sites are only valid if they can be learned from, and provide learning to others.
235. **Development of a National Diploma Course/Program.** Building on previous approaches at both the national level (SEMRICC) and at the regional level (Pacific IWRM, PACC) the project will develop partnerships with different national and regional organisations to support capacity development. At the national level, the project will develop a partnership with the Solomon Islands National University (SINU) to develop a national diploma on ‘Water and Adaptation’. This is designed to ‘formalise’ the capacity development process and encourage future government staff and others looking at options in NGOs and the private sector to better understand adaptation and the impact of climate change on water resources. At the regional level, collaboration will be made with the Regional Pacific IWRM Project Coordination Unit based in SPC/SOPAC in Suva, Fiji and the PACC PMU based in Apia, Samoa. The Pacific IWRM project has over the years delivered a variety of training and capacity development courses including courses on hydrology and IWRM in partnership with the Australian based International Water Centre⁴¹. The opportunity for SIWSAP is to look at building a higher level course beyond the diploma level with the involvement of SINU, International Water Centre staff, and regional experience in SPC/SOPAC⁴² and SPREP; a nationally developed and consistent course that can train future professionals.

³⁹ These were constructed by the current World Bank Rural Development Program engineer.

⁴⁰ The rural WASH policy specifically states use of the Community Led total Sanitation (CLTS) and Participatory Hygiene and Sanitation Transformation (PHAST) methodologies. It is not clear how well these methods will work in practice in the Solomon Islands. Off-the-shelf transferred approaches often do not work so well in application in the Pacific.

⁴¹ <http://www.watercentre.org/>

⁴² For example, SOPAC developed a Hydrological Training Programme for Small Islands Countries in the Pacific 2004-2006 with NIWA and supported by NZAID. See SOPAC Training Report #126.

Output 4.3. *Multi-media knowledge products on CC, CCA, IWRM, lessons learned and best practices developed and disseminated extensively to communities, schools and the general population and through ALM*

236. A critical element of adaptation is communication – of the baseline (and what this actually is, and is based upon), the identified vulnerabilities and impacts, and the solutions to implement. Consultations during the PPG highlighted the surprising afterthought of climate change, despite work under the UNDP PACC project, and the development of the national Climate Change policy. There is clearly a need to better articulate climate change, adaptation, and wider water management challenges across the country. Building on the use of partnerships and learning networks the following activities will be implemented:

1. **Participatory video and video diaries.** The PMU will use, and will provide participatory video services at the identified pilot sites, replication sites, and as part of the national Sanitation Campaign. Participatory video ‘kits’ will be procured by the project and training will take place with the PMU and partners, including the Provincial Officers for application at the pilot sites. Videos will be professionally edited and prepared into knowledge products for sharing nationally and regionally. Professional services will be contracted in as needed to support this process, building on learning from other projects in the region that have used similar approaches. Video diaries will be developed with key Champions identified throughout project implementation – the focus of these videos will be on behaviour change, for example, changing the way groundwater is used or pumped, changing approaches and attitudes to rainwater and hygiene, changing sanitation practices and beliefs.
2. **Theatre and Stories.** Pacific culture in general is very much oral/aural; related to stories and the passing on of knowledge and experience through discussion and learning-by-doing. Many elderly people in villages are valuable sources of information in understanding historical trends in weather patterns, tree growth, coastal erosion, dry periods, storms and cyclones etc. This has been used to good effect in Kiribati where knowledge in villages has helped to confirm changes in lagoon shape, shifting sand dunes, etc. Building on this history of storytelling and dialogue, Melanesian theatre groups are well renowned for their approach and the project will commission theatre groups to support the communication needs of SIWSAP. Local, and regional Melanesian groups⁴³ will work together to develop a programme that is aimed at schools, rural training centres (RTC’s), Churches (and their networks) and communities on climate change, adaptation, water resource protection and pollution, and sanitation.
3. **Communication Sharing.** All materials will be made available nationally and regionally. National materials will be focused on the oral/aural – using video and radio, although these will be appropriately documented. Other considerations include the development of the project ‘brand’, and the development of a project logo. These activities will be discussed during the inception phase of the project. Knowledge products will be shared with national and regional adaptation networks such as the Asia-Pacific Adaptation Learning Network and the Adaptation Learning Mechanism (ALM). Communications is key to this project. The Mid-Term Evaluation of the PACC project⁴⁴ highlighted the importance of communications for capacity development and the critical area of sharing experiences and knowledge to learn and shape behaviors change approaches together with communities. This is critical for SIWSAP to have success on-the-ground at pilot and replication sites, and in influencing the wider Province to National level. The PMU must focus on communications as a core and often overlooked element of project implementation.

Table 7: Summary of Main Activities for Outcome 4

Output 4.1. *Overarching policy and legislation for the water sector that integrates CCA components in IWRM plans drafted and advocated, including guidelines for climate resilient water supply development in vulnerable areas*

4.1.1 Development of a Climate Change Knowledge Clearing House with partners

⁴³ For example, Won Smolbag based in Port Vila, Vanuatu are a highly experienced Melanesian theatre group who also have experience with radio stories and shows. They also have Solomon Island performers and can conduct shows in English and Pidgin.

⁴⁴ PACC Solomon Islands MTE Report 23.Oct.2012 draft

- 4.1.2 Develop scientific and/or policy paper codifying knowledge developed through SIWSAP on climate change impacts on the water resources of the Solomon Islands
- 4.1.3 Development of guidelines and toolkits that can reach various stakeholders (including vulnerable groups including women and children) for climate resilient water supply and sanitation development in vulnerable areas of the Solomon Islands
- 4.1.4 With Partners, design and host annual National Water and Adaptation Forums
- 4.1.5 Dissemination and awareness raising of national level policies (i.e. the new Rural Water Resources and Sanitation Policy) at the provincial and community levels

Output 4.2. *Institutional and community capacities strengthened toward water-sector CCA formulation, implementation and monitoring at the national and local levels*

- 4.2.1 Improvements in current, and expansion of national hydrological monitoring sites to include climatic/meteorological parameters
- 4.2.2 Development of the Sanitation and Adaptation Partnership with Tuvalu, including exchange visits, assessments, active demonstrations with partners
- 4.2.3 Design and implementation of a National Sanitation Campaign, including demonstrations and consultations
- 4.2.4 Peer-to-Peer Learning Network established, including site exchange visits within and between Provinces
- 4.2.5 Development of a national diploma on Water and Adaptation with the Solomon Islands National University, including higher course development
- 4.2.6 Community and provincial level training of climate adaptive water management infrastructure maintenance and sustainability (in conjunction with Output 2.1 and 3.1)

Output 4.3. *Multi-media knowledge products on CC, CCA, IWRM, lessons learned and best practices developed and disseminated extensively to communities, schools and the general population and through ALM*

- 1.3.1 Participatory video and video diary ‘kits’ and training procured and implemented across communities
- 1.3.2 Commissioning of theatre and radio communication products and roll-out across schools, Churches, rural training centres and communities on climate change impacts, vulnerabilities, impacts on water resources, protection and pollution and sanitation.
- 1.3.3 Project communication branding development, and open source sharing of all materials

2.5 Key Indicators, Risks and Assumptions

237. The project results framework in Section III detail indicators, the baseline, targets, and sources of verification at the Objective and Outcome levels. Project indicators are aligned with the LDCF Adaptation Monitoring and Assessment Tool (AMAT).

238. At the level of *Project Objective* the indicators are:

- At least 6 Water Sector Climate Adaptation Response Plans developed and implemented by national agencies and Provincial Authorities to improve adaptation response. (aligned with AMAT 1.1, 2.1 & 2.3)
- Resilient and safe water supplies to climate change impacts for 50,000 people (10% of national population), and improved sanitation for 25,000 people. (aligned with AMAT 3.1)

239. At the four Outcome levels, the indicators are:

Outcome 1: Water Sector – Climate Change Adaptation Response plans formulated, integrated and mainstreamed in water sector-related and in broader policy and development frameworks (AMAT 1.1, 2.1)

Indicators:

- Vulnerability assessment and Climate Adaptation Response Plans for the Water Sector inform the development of (i) SIG Provincial Plans incorporating water adaptation, (ii) budget allocations, and (iii) institutional capacity development for adaptation

Outcome 2: Increased reliability and improved quality of water supply in targeted areas

Indicators:

- Number of people provided with access to safe water supply and basic sanitation services given existing and projected climate change (AMAT 1.2)
- No. of accurate warnings disseminated resulting appropriate adaptive responses at community and household levels

Outcome 3: Investments in cost-effective and adaptive water management interventions and technology transfer

Indicators:

- No. of pilot sites adopting cost-effective and adaptive water management technologies based on community driven Water and Adaptation Response Projects at > 20 sites aligned with (AMAT 3.1)
- National Water investments include adaptation interventions to maintain medium to long term sustainability and provide resilience to community water needs and requirements (aligned with AMAT 1.1 & 3.1)

Outcome 4: Improved governance and knowledge management for Climate Change Adaptation in the water sector at the local and national levels

Indicators:

- An annual National Water Forum where key stakeholders generate and exchange knowledge generation, and develop policies that facilitate climate change mainstreaming in the water sector
- Number of awareness materials on climate change risks and vulnerability of water sector, and appropriate adaptation and response measures produced through the SIWSAP project with national partners providing cross-sector adaptation relevant information (aligned with AMAT 2.1 & 2.3)

Risks and Assumptions

240. A Risk Log has been prepared that also describes mitigation actions (Annex 11). The primary risk is constraints in capacity, which is common across Pacific Island Countries. However, further risks to deliver the project include the weather and travel limitations due to cyclones, storms, and rough seas. Many communities are on outer islands of the main Provincial capital island, and travel to them is sometime difficult. Furthermore, as a country that experiences cyclones, volcanic eruptions, earthquakes and tsunamis, extreme natural events have also been considered in the risk log as a possible threat to project implementation.

241. Other risks, although less severe, include limited community ownership and interest. However, during the PPG phase it was clear that there is interest in the project and demand for improved water and sanitation needs, where communities are faced with limited options and already suffer from climate induced problems. This was clear with the proposed site that could not be included in the project as 95% of the population had already relocated from the island due to sea level rise and lack of freshwater. The project will therefore work closely with communities, investing in staff at the Provincial level to work directly with communities and networks at the most appropriate level to support ownership of interventions. The aim is to also work with Provincial Administrations to help them understand the adaptation needs and costs, and over four years work with them to integrate adaptation costs into Provincial budgets.

242. Other risks include weak coordination between agencies and one of the key activities for the PMU is to improve this coordination function, so that at project end there is a clearer, more dynamic sharing of information between central government in Honiara, Provincial Authorities, different line Ministries, and development partners. Land ownership and rights of access are always difficult in the Pacific. Rather than avoid this, the PMU will specifically work at how land tenure systems can be improved to bring adaptation benefits for all, including land owners through the use of water source protection schemes and innovative financing mechanisms.

243. One major assumption is that the country remains peaceful. The risks and assumptions are clearly defined in the Strategic Results Framework.

2.6 Cost Effectiveness

244. As an alternative, moving 'backwards' into single sectoral solutions for water management are no longer valid options. Integrated Water Resources Management has become the global standard approach to water resource management, and increasingly the recognition globally is that this approach itself is in need of upgrading to better introduce the complications between sectors, the 'nexus' where the greatest challenges, often triggered through existing and increasing climate variabilities are exposed. One 'sector' of the water community-of-practice that has suffered from a singular approach has been the water supply and sanitation community. Driven by MDG targets and other concerns, quite rightly, the WASH sector has focused on service delivery. Despite this, sustainability of WASH interventions is often poor, ranging from between 30-70% globally after 3 to 5 yrs. Engineering and 'relief' agency thinking has dominated the need to provide a service, but has not paid adequate attention to the community and social side of WASH – gender, capacity development, operation and maintenance training, community responsibility, establishing funds for maintenance and expansion, protecting surface and groundwater sources, conserving watersheds, etc.

245. The reality, starkly explained in the Solomon Island Government rural WASH policy (draft, June 2013) explains that inadequate attention has been paid to the softer side of provide rural WASH services – and that the capacity development and monitoring needed to deliver these services needs to come from external service providers – changing the way Government works on these issues. Consequently, this approach, this admittance of the need to change, and the development of a policy to change the process, after a period of change and 'bedding in' the new role, will allow the government to become much more cost effective at delivering rural WASH services. This project is designed to aid that process, and to build capacity to reduce historically failed WASH and water resource management investments.

246. The project is based on a resilience framework to structure the interventions, and for self-monitoring purposes by the Project Management Unit to ensure that project interventions contribute to building resilience, using the Water Sector Climate Adaptation Responses plans as entry points into pilots sites, replication sites, and wider across Provinces. Cost effectiveness is a key element of water resource management following IWRM principles. IWRM is a cost effective mechanism because of the cross cutting and multi-sectoral issues, reducing transaction costs and improving communication and influence. This project is not just dealing with water, but will help understand the water and climate linkages and the impacts of climate and the island ecosystems that capture, store, clean, convey, and provide water. Building capacity in IWRM approaches and the necessary planning and management skills so critical in the delivery of IWRM will not only improve the collaboration between sectors (and therefore GEF Focal Areas: Biodiversity, Climate Change, IW) leading to global environmental benefits, through for example prevention of land degradation, protection of international waters, and adapting to climate change, but it will also increase the efficiency and effectiveness of GEF support to PICs as a nationally implemented project, thereby enhancing the cost-effective achievement of both global environmental and national sustainable development goals. For example:

- Focusing at the Provincial level, and investing in the development of Provincial Water Plans is where changes are desperately needed in mobilizing IWRM approaches, improved rural WASH delivery, and a greater understanding of adaptation impacts and responses, including reducing risks from disasters and other climate related threats. Centralized Government responses are not the most cost effective or efficient approaches in moving forward rapid learning, and often come with high transaction costs. This project will improve this process over a four year period using pilot sites to demonstrate change, at the same time using a twin-track strategy to also focus on policy development, mobilization and learning on new policies to build in understanding of how new policies perform in practice, and actually embed staff at the Provincial level.
- More collection and analysis of hydrological and meteorological data and information, including community based information and anecdotal records. This information is needed to help build national understanding of climate and hydrological sciences, and to ensure that this is taken to Provincial level to inform decision making, rather than staying 'held' in central departments in Honiara. Investments in hydrological and climatic data collection and the development of a clearer national picture, through other projects,

Government and improved scientific understanding will improve the overall knowledge of the country to climate risks and hazards. Adding to the existing hydro-climatic monitoring network is cost effective in terms of providing better information across sectors using the current network (and not developing parallel processes), and across Government and society to better prepare for climate change, cyclones, and other weather events.

- SIWSAP Provincial Officers will be key communicators between the pilot sites, the Provincial Administration and provincial stakeholders and partners including the water initiatives funded by other donors as co-financing support to this project. The PMU will therefore be cost effectively networked across almost the entire country, saving logistical time and costs, reducing the risk of travel delays due to weather hazards, and placing the Provinces at the heart of the project.
247. By feeding information and lessons learned into appropriate networks, especially by sharing lessons nationally, this project will step outside of conventional and costly project silo approaches and develop a national dialogue on water and climate change. This also has relevance wider across the Pacific, and into other islands such as Caribbean and African SIDS. There is a real cost effective opportunity to widen the scope of the initial investment at pilot sites and support the Solomon Islands in capacity development to increase resources and abilities to continue approaches initiated under this project. Lessons learned will add value to national, regional, inter-regional learning and will help inform the GEF International Waters and Climate Change Adaptation portfolio using endemic and new evidence based national knowledge. This will be shared with the UNDP ALM and the IW:LEARN knowledge platforms.
248. Equally, taking WASH promoters and working with them on wider water resource management issues, especially the need to focus on medium to longer term water and adaptation concerns, using the WSCCAR plans to identify options builds resilience into other programmers, such as supporting the EU funded Building Human Development: Improving WASH in the Solomon Islands project, the EU sector reform funded Improved governance and access to WASH for rural people programme, CHICHAP, and the ongoing AusAID funded (SIACWSI) programme. As a project, SIWSAP has multiple entry points into other project and programmes using IWRM concerns⁴⁵ as a mechanism to raise adaptation awareness and interventions is a cost effective entry point into multiple sectors.

2.7 Sustainability

249. Sustainability of the investments made by the LCDF are critical to avoid the common problem of poor operation and maintenance – an all too common problem with investments and projects associated with rural water supply, sanitation and hygiene projects. This is evident in the statistics for rural WASH coverage, and the honest explanation of poor sustainability for the sector explained in the draft rural WASH Policy (June, 2013).
250. In order to ensure sustainability, the project was designed based on extensive consultation with partners and co-financing organizations and other project stakeholders. Extensive visits were made during the PPG Phase to identify sites, develop initial vulnerability and adaptation assessments, and to review the water supply, sanitation, and wider water resource issues at each of the six sites. A key element of this was to understand the concerns of the communities visited, at times the difficulties in getting to the sites, and to better understands the fragility of water supply at some of the locations.
251. General information and studies across the country and wider region confirm that predicted climate changes and general impacts can be derived – yet visiting a variety of sites makes it clear that the majority of this information and understanding is not ‘translated’ into local island realities. This is not about downscaling the GCM’s into reports at Provincial level, but taking the overall predicted range of climate change impacts and grounding them in the reality of communities and those who are or will be further affected by impacts on their water resources. The PPG highlighted concerning trends in water shortages, polluted freshwater, failed project interventions, a lack of governance in the sector, and a lack of capacity and resources.
252. **Institutional sustainability.** Capacity development of communities, Provincial Administrations and RWWS/PEHD officers in the regions, will ensure that every opportunity is provided to train, learn, and

⁴⁵ ‘Concerns’ meaning the impact of climate change on water resources, and the knock-on effects on this on human health, sustaining livelihoods, food security, national development.

share from project activities. Constant support, offered by the PMU to the national level agencies, MMERE, MECDM, NDMO, MHMS-RWSS who work on the complete range of issues that SIWSAP has to deal with, will allow for dialogue and exchange between agencies and the sharing of information on climate change and adaptation issues. At present the project mentality tends to divide and split this information across many organizations. IWRM provides a collaborative framework to share information across many sectors. Using the project to test the new policies on rural WASH and water and sanitation allow for learning from SIWSAP, and the co-financing partner projects, to feed rapidly back into policy review processes, to allow for changes to be taken into account, and for the project to support national decision making in doing this.

253. The development of Provincial Adaptation Plans essentially grounds the NAPA at the Provincial level. This is critical to mobilize adaptation support at the Provincial level where many climate change impacts and ongoing vulnerabilities exist. This will establish clearer communications and sharing of adaptation needs across and between Provinces, and to the national level through the establishment of National Water and Adaptation Forum. This Forum will be the annual learning point for adaptation across Government, and will catalyze action to mobilize annual learning into activities on-the-ground. It will strengthen understanding in the nascent Climate Change Working Group (CCWG) at the national level, and will focus on fostering far greater linkages between the CCWG, the National Disaster Management Council, and the newly established National IWRM Coordinating Committee. This learning network will become the new institutional model for sharing information on water and climate change, cemented in the annual National Water and Adaptation Forum – the first of its kind across the region.
254. **Financial sustainability.** This is a core element of the design of the project. Through applying interventions as demonstrations of behaviour change rather than one-off interventions and with a strong element of capacity development, support, confidence building approaches. The objective is for project interventions, and learning during the project will demonstrate and affect changes in behaviours long term. Furthermore the development of the WSCARR plans – actually demonstrate the range of issues to be considered with water and sanitation management, and provide a better understanding to discuss with other development partners and across central Government to adjust future investments and practices, and leverage additional resources to ensure adequate water adaptation interventions in the future.
255. **Environmental sustainability.** Water resources are provided as a key ecosystems service, and provide other ecosystem services ‘downstream’. Managing water resources is an often delicate combination of developing and exploiting a resource within defined limits of sustainability, to maximise the benefits of the water. In small island environments, these water resources can be very fragile, either as shallow groundwater, or surface water flows. The small scale of islands, and the closer interactions of island ecosystems often means that bad practices can manifest quickly as impacts when compared to larger continental ecosystems. The causal links are often very rapid – for example, sewage and other toxic waste and the impact this can have on near-shore waters and coral reefs. SIWSAP is designed to manage these risks, and to build sustainability into water sector developments, and sanitation. Adaptation requires interventions that not only ‘add value’ to the process through taking into account the potential climate change impacts, but which also have to prepare for the future, building sustainable approaches into interventions. With the continued demand for water resources, and high population growth rates in the Solomon Islands, existing fragile water resources are likely to come under increasing pressure from climate impacts, pollution and over-use. The Pilot projects are designed to hold national ‘appeal’ – sites that many Solomon Islanders can recognise as places where they grew up, or where family still lives. Keeping the sites relevant to people will help to foster the behavior change needed to build better water management practices in the future.

2.8 Replicability

256. Ensuring the replicability of project resources is a key design consideration of the SIWSAP project. The project is designed to collect information at both the National and Provincial levels to aid the design, investment and implementation of future adaptation related projects. Systematic reporting, collection of information, the National Water and Adaptation Forum and other project events are designed to share experiences and provide a platform for replication of the approach and re-design of interventions in a continual learning process. The process of assisting existing and programmed projects working on rural

WASH and other water interventions through adaptation interventions immediately takes the project to scale through replication.

257. In Outcome 1, the process of developing provincial and community Water Sector Climate Change Adaptation Response (WS-CCAR) Plans will be replicated in further sites where the provincial and community members leading the planning process in the pilot sites will in turn train and facilitate the planning process in the replication sites. In Outcome 2, similar replication approach is applied to the Water Resource EWS development, which will be replicated in selected sites through the development of training materials and know-how through the EWS establishment process in the pilot sites.
258. The project contains a strong learning structure, as a core component of the resilience framework the project is structured around. Equally, reviewing the regional UNDP-GEF Pacific IWRM 'lesson learning' and other Pacific IWRM project Steering Committee documents⁴⁶ (which is a project that already builds on many regional lessons learned over the last ten years as part of its project design), stakeholder engagement and technical support stand out as key areas requiring constant support across national demonstration project management units Pacific wide. Despite this, the lessons learned stories from the regional IWRM project indicate great success when focusing and engaging with stakeholders, but that project management remains a constant challenge. This project will build capacity throughout the project with the addition of a series of Provincial Officers – embedded at the Provincial scale to work with the government and communities, NGOs and networks, to support project interventions, and to support MHMS-RWSS in looking at adaptation options when developing new sites.
259. Another key lesson is also the validity of establishing a learning and capacity development programme formally. SIWSAP will aim to do this with the Solomon Islands National University (SINU) and look at a national level Diploma, and at international academic support to take this further. This key confidence building element, locally available to people (SINU is based in Honiara) will help build national capacity.
260. Project outcomes are designed to build incremental learning and capacity, from demonstration and replication to strategic investments, based on initial project learning, and assessment of gaps in knowledge and understanding by the PMU. This learning will be taken to planning and policy levels at the Provincial to National level, feeding in vital lessons from Provincial on-the-ground demonstration, directly opposite to nationally determined and rolled out project approaches.
261. Furthermore, networks and platforms will utilized and established for both tacit and codified knowledge generated through the SIWSAP project is captured and shared. For example, the project website will be the central knowledge hub for information sharing, which will also be linked to the Adaptation Learning Mechanism (ALM) which is a global web platform for information exchange for professionals working on climate change adaptation. Through consistent and real-time output of knowledge and information from the Project on the web, information and lessons learned from the Project can be consumed and utilized to support similar efforts not only in the country but also around the world.
262. Replication of project interventions will also be through policy reform. The new rural WASH policy is clear in its mandate, and equally, the national water and sanitation sector plan will provide the conduit for SIWSAP to enter into discussions concerning adaptation considerations with multiple sectors – where before these discussions never occurred.

2.9 Stakeholder Engagement Plan

263. Annex 8 details the stakeholders identified during the PPG phase, including both institutions and projects/programmes that are relevant to the project. A wide range of stakeholders will be involved in the implementation of this project. Specific roles of some are described in Section V, Management Arrangements. AusAID and the EU as the primary financiers of rural WASH work through SIACSWI and the EU Sector Reform contract will be regularly involved in supporting and guiding the project through their role in the Project Advisory Group, as well as relevant Government Ministries.
264. Key activities regarding the involvement of stakeholders are different levels will be to guide project advocacy and communications work to ensure it is socially relevant to the culture of the Solomon Islands, and to also develop more innovative approaches than standard, and often not very inspiring communications material. The National Water and Adaptation Forum for example will be developed jointly with stakeholders as the primary annual event, but they will also be consulted for specific advice relevant at

⁴⁶ SOPAC/GEF/IWRM/RSC.5/7, October, 2013.

the Provincial level, for example for Choiseul Province using the CHICHAP Partners Advisory and Implementation Group. Meetings and discussions with stakeholders during the PPG Phase highlighted the recognition of adaptation concerns and lack of information, but also the lack of direction in terms of where to go for advice, information, data, and what platforms for discussion existed. Stakeholders will help guide the project to answer these questions.

265. A wide range of stakeholders will be involved in the project, tailored to the specific needs of the four project outcomes. A crucial component of PPG activities was to consult on the detailed design for stakeholder engagement. Key stakeholders to be engaged include a range of government line ministries to implement and support the project implementation, NGOs, project site-specific Provincial Governments and local communities including some of their interest/community groups. In general, stakeholder engagement will build on the PPG Phase, and initially begin at the inception workshop which will be held within the first twelve months of project start. However, recruitment of the PMU positions, specifically the Project Manager will start the stakeholder engagement process, through meetings and initial discussions as the PMU establishes its own 'network' of contacts across institutions and projects/programmes.

266. The Inception Workshop should address a number of key issues, starting with assisting all development partners to fully understand and take ownership of the project, detail the roles, support services and complementary responsibilities of all delivery/implementation agencies included in the project organization structure, and discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. A stakeholder engagement process will also be initiated at the inception workshop. This will go through a process, per project Outcome to identify:

- Who are the key stakeholders (in addition to those already extensively identified)
- What role(s) do they play and what contribution can they make to the project (are they interested in contributing to the project?)
- What capacities are available to assist in supporting the project
- What type of engagement does the project need that they can offer (and if support is needed, what approaches are needed to generate interest in the project)

267. One aim of this process is to identify where current adaptive capacity exists, for example where is the knowledge and information, which stakeholders have key assets the project requires, which institutions have information and capital (social as well as resource capital), and where innovative approaches require a stronger enabling environment to bring them into application. The Solomon Islands is a small country, therefore key stakeholders are already involved in the project through different roles, including the Project Advisory Group. NGO's will provide a lot of on-the-ground capacity to assist in delivering activities at the pilot site level, and for the strategic investments under Outcome 3. Specifically,

268. Outcome 1: Pilot Project Committees – representing communities at the Pilot sites, Provincial Government and other projects and NGO's working in the area will be involved in reviewing pilot site activities and supporting implementation. The Provincial Government, through its different agencies ('Works', and the Provincial Environmental Health officers for example) will support the implementation of Outcome 1. MMERE – WRD, MHMS-RWSS, and MECDM will all be involved in supporting the development of the WSCCAR Plans.

269. Outcome 2: where sites can be supported by MHMS-RWSS and the UNICEF Team working on the Building Human Development project focusing on WASH at different sites across Choiseul, Isabel, Renbel, Makira and Temotu, as well as the NGO service providers including World Vision, LLEE, SIDT, ADRA; amongst others. Annex 8 provides further details on different stakeholders able to support on-the-ground rural WASH activities. Including them in the project is key to working with the communities-of-practice that SIWSAP is aiming to change standard WASH practices with. NDMO and the Red Cross will also be important to advise and support the development of community based early warning approaches, and for the support to the project in building capacity on disaster risk reduction.

270. Outcome 3, in addition to national stakeholders who will support the development of the competitive process, and those who will support the delivery of interventions, will require regional stakeholder involvement with CROP Agencies able to support capacity development activities, and NDMO with MMERE-WRD to assist in the procurement of state-of-the-art equipment for disaster response in the future. Development partners with volunteer schemes (such as AusAID) will also be expected to engage in this Outcome to assist in securing volunteer support to the project.

271. Outcome 4 will require stakeholders previously identified to share climate change related information from project and programmes, including development partners, MMERE-WRD specifically, with consultant/CROP Agency support to select, procure and install hydro-meteorological equipment. Under this Outcome, regional stakeholders will be include in the project from Tuvalu under the proposed Sanitation and Adaptation Partnership. Church Groups and networks, rural training centres, communications experts, and the National University will all be involved in supporting the delivery of Outcome 4. The below table illustrates the various roles of key stakeholders that will be engaged in the SIWASP implementation process.

Table 8: Stakeholder Involvement During PPG and Expected Full Implementation Role

Stakeholder	Involvement During PPG and Expected Full Implementation Role
Water Resources Division of the Ministry of Mines, Energy and Rural Electrification	<ul style="list-style-type: none"> • Main SIWASP Executing Agency for the entire project • Part of the PPG Team for pilot missions • In-kind and co-finance support to the project through budget • Coordinate policy and legislation development • Hydrological monitoring and water resource assessments • Water quality monitoring • Coordinate access and partnership arrangements with customary landowners • Take lead in seeking public-private partnerships • Support to community engagement and development of project best practice materials
Rural Water Supply and Sanitation Programme of the Ministry of Health and Medical Services	<ul style="list-style-type: none"> • Secondary SIWASP Executing Agency • Coordinate and implement rural water supply projects • In-kind support to the project working with PMU on pilot site and investment designs and interventions • Development of standards and guidelines for RWSS projects • Implementation agency for Outcomes 2 and 3, working closely with MMERE-WRD and Provincial Authorities • Support to community engagement and development of project best practice materials
Climate Change Division – Ministry of Environment, Climate Change, Disaster Management and Meteorology	<ul style="list-style-type: none"> • Assist with mainstreaming of climate change activities • Further Development of climate change policy through review and learning • Provide guidelines and training in V&A assessments to develop WS-CCAR framework and plans • Support the National Water and Adaptation Forum • Provide vulnerability information and climate relevant information to the project • Guide the implementation of Environment Impact Assessment for water projects (where required by law) • Support to community engagement and development of project best practice materials
National Disaster Management Office	<ul style="list-style-type: none"> • Assist with mainstreaming of DRR and provide training • Assist provincial governments with disaster preparedness and coordination of village disaster committees • Assist PMU with pilot site interventions • Support the National Water and Adaptation Forum • Support key community activities under Outcome 2 related to community based early warning • Support to community engagement and development of project best practice materials
Ministry of Lands and Housing	<ul style="list-style-type: none"> • Provide guidance on land owner identification, consultations and partnership building, community consultations
Ministry of Forests and Research	<ul style="list-style-type: none"> • Support with catchment management activities where necessary
Ministry of Infrastructure Development	<ul style="list-style-type: none"> • Design and construction of water supply infrastructure – at the Provincial level Works
Provincial Governments	<ul style="list-style-type: none"> • Mainstreaming of climate change adaptation • Identification of project sites • Monitoring of project activities, in-kind support to project delivery • Review of pilot site designs and interventions, and sign off with the SIWASP Provincial Officer and SIWASP PMU • Management and implementation of provincial urban water supply system in

Stakeholder	Involvement During PPG and Expected Full Implementation Role
	partnership with Solomon Islands Water Authority <ul style="list-style-type: none"> • Support to community engagement and development of project best practice materials
Solomon Islands Water Authority	<ul style="list-style-type: none"> • Provide guidance on supply and demand management approaches – especially for township sites
School of Industrial Development of the Solomon Islands College of Higher Education	<ul style="list-style-type: none"> • Development of training materials and provide training for community based water technicians • Assist in training and learning and formal training during implementation
Community organizations	<ul style="list-style-type: none"> • Implement WS-CCA projects as major partner in the project • Establish governance arrangements for IWRM • Contribute labor and materials, and ideas, and energy, and enthusiasm for project activities
Solomon Islands Meteorological Services	<ul style="list-style-type: none"> • Develop and assist communities and provincial governments with early warning systems and information for community based disaster preparedness • In-kind provision of information and data to the project
Ministry of Finance and Treasury	<ul style="list-style-type: none"> • Mainstreaming of Climate Change into national and provincial budgets, through the Province to National process of learning from project pilots
Ministry of Development Planning and Aid Coordination	<ul style="list-style-type: none"> • Coordinate donor support towards the water sector • Mainstream climate change into development budgets • Coordinate national-level resource mobilization strategies for the water sector • Learning from the project to help guide future investments
Ministry of Rural Development	<ul style="list-style-type: none"> • Mainstreaming of IWRM and CCA into water supply and protection projects funded under the Constituency Development Fund
Solomon Islands National University	<ul style="list-style-type: none"> • Support Outcome 4 of the project relating to capacity development support through development of a national diploma
Solomon Islands Red Cross; World Vision; Adventist Development and Relief Agency; Caritas; other NGOs and church-based organizations working on water and sanitation	<ul style="list-style-type: none"> • Plan and implement community based water supply and sanitation projects using IWRM and CCA approaches • Plan and implement community based early warning work • Invest in-kind support in networks and learning
Private Sector Companies	<ul style="list-style-type: none"> • Design and provision of water supply materials and equipment; public-private partnerships in provision of services and infrastructure • Better understand challenges to implements projects and supply chain risks for material and supplies for Provincial Governments and communities

III. PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in UNDAF:
Improved national, provincial and community preparedness and responsiveness to climate change and disaster risks and sustainable management of natural resources

UNDAF Outcome Indicators:
1.1.1 – Strengthened capacity to integrate and implement policies/strategies for environmental sustainability, disaster risk reduction/management and climate change adaptation and mitigation at national level
1.1.3 – Strengthened national capacity for effective management of natural and water resources, renewable energy, waste, land and land rehabilitation that promote good agricultural practices for conservation of the environment and biodiversity.

Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): 3. Promote climate change adaptation

Applicable GEF Strategic Objective and Program:
 CCA-1: 'Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global levels'
 CCA-2: 'Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global levels'
 CCA-3: 'Promote transfer and adoption of adaptation technology'

Applicable GEF Expected Outcomes:
 Outcome 1.1: Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas
 Outcome 1.2: Reduced vulnerability in development sectors
 Outcome 2.1: Increased knowledge and understanding of climate vulnerability and change – induced risks at country level and in targeted vulnerable areas
 Outcome 2.2: Strengthened adaptive capacity to reduce risks to climate-induced economic losses
 Outcome 2.3: Strengthened awareness and ownership adaptation and climate risk reduction processes at local level
 Outcome 3.1: Successful demonstration, deployment and transfer of relevant adaptation technology in targeted areas

Applicable GEF Outcome Indicators:
 Outcome 1.1: Outcome Indicator 1.1.1: Adaptation actions implemented in national/sub-regional development frameworks (no. and type)
 Outcome 1.2: Outcome Indicator 1.2.3 Number of additional people provided with access to safe water supply and basic sanitation services given existing and projected climate change (disaggregated by gender)
 Output 1.2.1: Output Indicator 1.2.1.4: Sustainable drinking water management practices introduced to increase access to clean drinking water (type and level) □
 Examples: Tube wells • Rainwater harvesting • Purification • Water storage • Other
 Outcome 2.1: Output Indicator 2.1.1.2: Risk and vulnerability assessments conducted and updated
 Outcome 2.2: Output Indicator 2.2.2.1: % of population covered by climate change risk measures (disaggregated by gender)
 Outcome 2.3: Outcome Indicator 2.3.1: % of targeted population awareness of predicted adverse impacts of climate change and appropriate responses (Score) – Disaggregated by gender. The score ranges from 1 to 3 and below are the explanations of the rankings based on survey results - 1. No awareness level (<50% correct) 2. Moderate awareness level (50- 75%) 3. high awareness level (>75% correct)
 Outcome 3.1: Outcome Indicator 3.1.1: % of targeted groups adopting adaptation technologies by technology type (disaggregated by gender)

	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
Project Objective⁴⁷ To improve the resilience of water resources to the impacts of climate change in order to improve	<ul style="list-style-type: none"> At least 6 Water Sector Climate Adaptation Response Plans developed and implemented (aligned with AMAT 1.1, 2.1, & 2.3) Resilient and safe water supplies to climate change 	<ul style="list-style-type: none"> Water and adaptation responses are not integrated into national policy or on the ground actions Rural water supply and sanitation is focused on service delivery and not medium to long term sustainability of water resources and supplies 	<ul style="list-style-type: none"> Water Sector Climate Change Adaptation Response Plans inform and guide policy implementation for multi-sector adaptation response investments At least 6 sites across 6 Provinces have resilient water supply options and improved sanitation with sustainable financing and operation and maintenance plans for over 	<ul style="list-style-type: none"> Assessments of National Water and Sanitation Policy and Implementation Plan Mid-term and terminal evaluation reports Annual multi-sector policies and plans at the national levels to check whether they include water adaptation 	Assumptions <ul style="list-style-type: none"> Willingness amongst stakeholders and projects to share climate related information Pilot Site Communities and Stakeholders remain willing to be involved in the project Adequate support from all the Provincial Administrations to implement project activities

⁴⁷ Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR

<p>health, sanitation and quality of life, and sustain livelihoods in targeted vulnerable areas</p>	<p>impacts for 50,000 people and improvised sanitation for 25,000 people (disaggregated by gender) (aligned with AMAT 3.1)</p>	<ul style="list-style-type: none"> • Little attention is paid to protection / restoration of natural infrastructure capturing, storing, cleaning and conveying water • NAPA is implemented mainly through development partner projects – no national learning mechanism in place 	<p>12,000 people (at least 5,760 women)</p> <ul style="list-style-type: none"> • At pilot sites, watersheds, including groundwater are better managed and protected (confirmed by water quality testing and flow/yield measurements) • Multi-sectoral understanding and integrated use of climate information, including budget allocations 	<p>solutions with associated budgets</p> <ul style="list-style-type: none"> • Assessment of whether and how watershed, including groundwater, are better managed and protected • Assessment of the quality and effectiveness of operation and maintenance plans • Questionnaires (repeated and modified for survey of key informants, women, to assess understanding and use of climate information) • Project reports and technical outputs • Meeting minutes, outputs from National Water and Adaptation Forum • Water quality testing in pilot and one non-pilot (control) site 	<p>(sometimes jointly)</p> <ul style="list-style-type: none"> • Climate and natural disasters do not hinder project activities and logistics • National Security situation remains stable and improving • Rural WASH and Climate Change Adaptation remain a priority for Government <p>Risks</p> <ul style="list-style-type: none"> • Weather impedes travel to some Provinces • Insufficient ownership and collaboration with Pilot Site communities and other beneficiaries • National economic situation is not able to allocate adaptation related components in budgets at end of project • Sectoral uptake of water adaptation planning is low
<p>Outcome 1⁴⁸ Water Sector – Climate Change Adaptation Response plans formulated, integrated and mainstreamed in water sector-related and in broader policy and development frameworks</p>	<ul style="list-style-type: none"> • Vulnerability assessment and Climate Change Adaptation Response Plans for the Water Sector inform the development of (i) SIG Provincial Plans incorporating water adaptation, (ii) budget allocations, and (iii) institutional capacity development for adaptation (aligned with AMAT 1.1, 2.1) 	<ul style="list-style-type: none"> • No adaptation plans or adaptation guidance exists for the water sector at the National or Provincial levels (including both for water resources and water supply, sanitation and hygiene) • Sporadic and anecdotal data and lessons on adaptation at Provincial level • Lack of downscaled details from national assessments across a wide area 	<ul style="list-style-type: none"> • At least 6 Water Sector Climate Change Adaptation Response Plans at Pilot Site level developed • At least 6 Provincial Water Adaptation Plans developed and budgets allocated • At least 6 additional Water Sector Climate Change Adaptation Response Plans at replication sites developed (1 per Province) • Training of relevant Provincial and National Staff in the Water Vulnerability Framework and Adaptation Response Plan • Provincial ‘package’ of 	<ul style="list-style-type: none"> • Project Annual Progress Reports • Water Adaptation Response Plans • Water Vulnerability Framework and Assessments • Guidance documents on Water Vulnerability across Provinces • Provincial Water Adaptation Plans and Provincial budget allocations • Pre and post workshops/capacity building training surveys/questionnaires • Training Packages • Mid-Term and Terminal 	<p>Assumptions</p> <ul style="list-style-type: none"> • Willingness amongst stakeholders and projects to share climate related information • Pilot Site Communities and Stakeholders remain willing to be involved in the project • Adequate support from all the Provincial Administrations to implement project activities (sometimes jointly) • Climate and natural disasters do not hinder project activities and logistics • National Security situation remains stable and improving <p>Risks</p> <ul style="list-style-type: none"> • Weather impedes travel to some Provinces

⁴⁸ All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.

			<p>relevant information to guide adaptation investments for the water sector</p> <ul style="list-style-type: none"> Replication sites mirror the process at pilot sites – implemented by SIG 	Evaluation reports	<ul style="list-style-type: none"> Insufficient ownership and collaboration with Pilot Site communities and other beneficiaries Capacity at Provincial level is unable to adequately perform tasks (lack of service providers) Provincial Administration are unable to secure budget allocations at the end of the project to improve adaptation responses
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Outputs to deliver Outcome 1:

- 1.1. Vulnerability assessments of water supplies (in terms of quantity and quality) to climate change in targeted critical areas refined or formulated
- 1.2. WS-CCAR plans prepared in the context of IWRM and in line with and integrated into existing local and national policy and development planning processes
- 1.3. Government budgets allocated to support implementation of key components of WS-CCAR plans

<p>Outcome 2 Increased reliability and improved quality of water supply in targeted areas</p>	<ul style="list-style-type: none"> Number of people provided with access to safe water supply and basic sanitation services given existing and projected climate change (AMAT 1.2) No. of accurate warnings disseminated resulting appropriate adaptive responses at community and household levels 	<ul style="list-style-type: none"> Tuwo: 100% of community have no water >5 times per annum. Gizo: reticulated system operates at 70% supply, with a further 70% leakage rate. Manaaoba: 90% of community has no RW supply >5 times per annum. Taro: 73% of community have no access to a toilet and no alternative safe water supply than existing RW tank system covering only 70% of community (empty >5 times per annum.) Santa Catalina: 94% of community have inadequate roofing to capture water, with 79% of tanks empty > 5 times per annum. Tiggoa: 55% of the community have no water supply >5 times per annum. 	<ul style="list-style-type: none"> Increased Water Storage at six sites provides a diversified approach to capturing and storing freshwater safely through island appropriate technologies (100% of communities have regular annual supply) Strategic freshwater reserves are rehabilitated and protected (where necessary) for pilot site locations (at least 1 site) Construction of appropriate sanitation technologies (e.g., composting toilets) at pilot sites (at least 4) to protect groundwater and other sources of water supply Trial sites for sanitation options – working with local and national campaign on ‘sanitation futures’ (>6 campaigns) to facilitate adoption and maintenance of sanitation technologies Clean up and protection of key groundwater recharge areas (i.e. Taro wetland – for >3 sties) Community based Early Warning ‘Systems’ (CBEWS) in place at more than 6 sites 	<ul style="list-style-type: none"> Technical pilot site reports: rainwater harvesting surveys, sanitation surveys, revised building codes, feasibility studies (for new water sources or system rehabilitation) Operation and maintenance manuals Health and sanitation statistics by Government and/or international/research institutions Protocols and appropriate Ordinances for sustainable use of water sources, especially groundwater Water quality testing in pilot and one non-pilot (control) site Mock EWS testing/drill in pilot and one non-pilot (control) site Community surveys/interview of informants on risk perception in pilot and one non-pilot (control) site Mid-Term and Terminal 	<p>Assumptions</p> <ul style="list-style-type: none"> Willingness amongst stakeholders and projects to share climate related information Pilot Site Communities and Stakeholders remain willing to be involved in the project Adequate support from all the Provincial Administrations to implement project activities (sometimes jointly) Climate and natural disasters do not hinder project activities and logistics National Security situation remains stable and improving <p>Risks</p> <ul style="list-style-type: none"> Weather impedes travel to some Provinces Insufficient ownership and collaboration with Pilot Site communities and other beneficiaries Capacity at Provincial level is unable to adequately perform tasks (lack of service providers) Provincial Administration are unable to secure budget allocations at the end of the project to improve adaptation
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				Evaluation reports	responses <ul style="list-style-type: none"> • Inappropriate use of additional sanitation facilities intensifies point source pollution of fresh and marine waters
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Outputs to deliver Outcome 2:

2.1. Community-level WS-CCA soft and concrete measures implemented to improve sanitation and water supply in times of scarcity, that may include, but not limited to: diversification of water sources; protection and restoration of ecosystems that protect critical water resources; improvements in water-use efficiency and overall demand-side management; use of innovative instruments; building on traditional knowledge; protection of freshwater lens through better sanitation practices in small islands (e.g., composting toilets) (in about 6 sites)

2.2. Community-based Climate Early Warning and Disaster Preparedness Information System tailored for water resources management developed and implemented in targeted areas

<p>Outcome 3 Investments in cost-effective and adaptive water management interventions and technology transfer</p>	<ul style="list-style-type: none"> • No. of pilot sites adopting cost-effective and adaptive water management technologies based on community driven Water and Adaptation Response Projects at > 20 sites aligned with (AMAT 3.1) • National Water investments include adaptation interventions to maintain medium to long term sustainability and provide resilience to community water needs and requirements (aligned with AMAT 1.1 & 3.1) 	<ul style="list-style-type: none"> • No current direct access to funding for community projects focusing on adaptation and water risks • Development partner and national interventions focused on rural WASH provision do not include adaptation response in project delivery-investments or in climate proofing projects • Only 1 publicly owned portable water filter/desalination unit exists for the entire country 	<ul style="list-style-type: none"> • At least 20 community driven, designed and developed Water and Adaptation Response Projects (aligned with co-financer interventions) • National Water investments to adaptation investments doubled by fourth year of project implementation • Appropriate water supply equipment successfully procured and delivered to pilot sites and key disaster stakeholders such as NDMO for enhanced preparation and response to water scarcity • Maintenance and operational guidelines developed and budgeted at the provincial and/or community levels 	<ul style="list-style-type: none"> • Quarterly reports (both visual and in writing) from participating communities and provinces • Mid-Term and Terminal Evaluation reports • Project site Operation and Maintenance plans, including at co-financer project sites • Sector budget reporting • Minutes of NCWG, WASH group, and NIWRMCC, NDMOC • Water supply equipment for emergencies successfully in Honiara and tested • Assessment and system testing of NDMO's state-of-the-art water supply technology • Training courses in disaster relief equipment use • Communication an learning products and outputs (from print to TV) 	<p>Assumptions</p> <ul style="list-style-type: none"> • Willingness amongst stakeholders and projects to share climate related information • Communities and Stakeholders remain willing to be involved in the project • Adequate support from all the Provincial Administrations to implement project activities (sometimes jointly) • Climate and natural disasters do not hinder project activities and logistics • National Security situation remains stable and improving • Volunteers are available • Communications specialists and journalists are interested in working on the project <p>Risks</p> <ul style="list-style-type: none"> • Weather impedes travel to some Provinces • Insufficient ownership and collaboration with communities and other beneficiaries • Capacity at Provincial level is unable to adequately perform tasks (lack of service providers) • Provincial Administration are unable to secure budget allocations at the end of the project to improve adaptation responses • Inappropriate use of additional
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					sanitation facilities intensifies point source pollution of fresh and marine waters
Outputs to deliver Outcome 3:					
3.1. Strategic investments in water infrastructure in target areas, including but not limited to: new household and communal water storage systems and infrastructure; provision of up to 4 portable water filtration and/or desalination systems for sharing across communities in times of extreme water scarcity.					
3.2. Compilation of best practices on applicable technologies for dissemination and replication by project partners with support from the project					
Outcome 4 Improved governance and knowledge management for Climate Change Adaptation in the water sector at the local and national levels	<ul style="list-style-type: none"> An annual National Water Forum where key stakeholders generate and exchange knowledge generation, and develop policies that facilitate climate change mainstreaming in the water sector Number of awareness materials on climate change risks and vulnerability of water sector, and appropriate adaptation and response measures produced through the SIWSAP project with national partners providing cross-sector adaptation relevant information (aligned with AMAT 2.1 & 2.3) 	<ul style="list-style-type: none"> No specific guidelines exist for water resources, supply, and sanitation relative to climate change impacts and how to plan for these No national forum exists for sharing, discussing, and learning from adaptation and water management programmes Rural sanitation coverage is at best only 18% of the population. Composting toilets are not well understood, and sanitation is not considered a viable option for rural communities Until recently, very little national advocacy for sanitation or understanding of climate change impacts Existing hydrological monitoring systems is not adequate for existing climate variability, or for predicted (and often very localized) climate changes 	<ul style="list-style-type: none"> 1 academic/scientific and/or policy publication on the climate change impacts on the water resources of the Solomon Islands Guidelines produced for climate resilient water supply and sanitation development in vulnerable areas of the Solomon Islands A total of 3 Annual National Water and Adaptation Forum are held (in years 2, 3, & 4 of project implementation) Improvement in, and expansion of current national hydrological monitoring network with 4 more sites installed Sanitation and Adaptation Partnership with IWRM participating countries (i.e. Tuvalu) in place Designed and Implemented National Sanitation Campaign with partners reach more than 20% of national population. Peer-to-Peer Learning Network established across Pilot and Replication Sites (Outcome 2) National Diploma on Water and Adaptation with Solomon Islands National University in place At least two creative and/or audiovisual products are produced utilizing participatory communications approaches to communicate, train, influence and provide learning from the project (participatory video, video diaries, theatre, music, etc) 	<ul style="list-style-type: none"> National Water and Adaptation Forum Report and Outputs Scientific and policy reports and publication Assessment of guidelines on climate resilient water supply and sanitation development Data from new hydrological monitoring sites Survey of teachers/students on quality of National Diploma curriculum Survey/assessment on use of composting toilets and other new improved sanitation practices through site reporting Survey/ dissemination records of communication outputs Mid-Term and Terminal Evaluation reports Assessment of increased no. of people with access to drinking water through SIG 	<p>Assumptions</p> <ul style="list-style-type: none"> Willingness amongst stakeholders and projects to share climate related information and to support the National Water and Adaptation Forum and Sanitation Campaign Willingness of IWRM participating countries (i.e. Tuvalu) to join the Partnership Adequate support from all the Provincial Administrations to implement project activities (sometimes jointly) National University has capacity and willingness to actively support the development of a Diploma Climate and natural disasters do not hinder project activities and logistics National Security situation remains stable and improving <p>Risks</p> <ul style="list-style-type: none"> Weather impedes travel to some Provinces Insufficient ownership and collaboration with Pilot Site communities and other beneficiaries Capacity at Provincial level is unable to adequately perform tasks (lack of service providers) Provincial Administration are unable to secure budget allocations at the end of the project to improve adaptation responses
Outputs to deliver Outcome 4:					
4.1. Overarching policy and legislation for the water sector that integrates CCA components in IWRM plans drafted and advocated, including guidelines for climate resilient water					

supply development in vulnerable areas

4.2. Institutional and community capacities strengthened toward water-sector CCA formulation, implementation and monitoring at the national and local levels

4.3. Multi-media knowledge products on CC, CCA, IWRM, lessons learned and best practices developed and disseminated extensively to communities, schools and the general population and through ALM

IV. TOTAL BUDGET AND WORKPLAN

Award ID:	TBD	Project ID(s):	TBD
Award Title:	SOI PIMS4568 FSP: Solomon Islands Water Sector Adaptation Project		
Business Unit:	FJI10		
Project Title:	Solomon Islands Water Sector Adaptation Project (SIWSAP)		
PIMS no:	4568		
Implementing Partner (Executing Agency)	Government of the Solomon Islands, Ministry of Mines, Energy and Rural Electrification (MMERE)		

GEF Outcome/Atlas Activity	Responsible Party / Implementing Agency	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	Budget Note
OUTCOME 1 Water Sector – Climate Change Adaptation Response Plans formulated, integrated and mainstreamed in water sector-related and in broader policy and development frameworks	MMERE-WRD / UNDP	62160	LDCF	71200	International consultants	78,000	26,000	-	-	104,000	1A
				71300	Local consultants	109,620	109,620	82,152	82,152	383,544	1B
				72300	Material & goods	-	-	-	-	-	1C
				74200	Audiovisual & Print Production Costs	10,000	10,000	10,000	5,000	35,000	1D
				72100	Contractual services - Companies	22,000	22,000	-	-	44,000	1E
				75700	Training, Workshops and Conferences	18,000	15,000	15,000	10,000	58,000	1F
				71600	Travel	89,874	50,271	51,408	-	191,553	1G
				72400	Communic & Audio Visual Equip	19,560	-	-	-	19,560	1H
				73400	Rental & Maint of Othr Equipment	6,000	2,000	2,000	1,000	11,000	1I
				74500	Miscellaneous Expenses	2,746	1,831	2,093	1,803	8,473	1J
					Sub-total LDCF	355,800	236,722	162,653	99,955	855,130	
					Sub-total Outcome 1	355,800	236,722	162,653	99,955	855,130	
OUTCOME 2 Increased reliability and improved quality of water	MMERE-WRD / UNDP	62160	LDCF	71200	International consultants	13,000	62,833	69,333	36,834	182,000	2A
				71300	Local consultants	4,578	19,578	54,546	50,991	129,693	2B

GEF Outcome/Atlas Activity	Responsible Party / Implementing Agency	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	Budget Note		
supply in targeted areas				72300	Material & goods	8,000	238,500	237,400	38,000	521,900	2C		
				74200	Audiovisual & Print Production Costs	-	6,000	6,000	7,600	19,600	2D		
				72100	Contractual services - Companies	25,000	146,500	150,500	85,000	407,000	2E		
				75700	Training, Workshops and Conferences	27,500	69,000	83,600	79,000	259,100	2F		
				71600	Travel	32,900	64,946	70,840	47,918	216,604	2G		
				72200	Equipment and furniture	1,000	-	6,000	6,000	13,000	2H		
				73400	Rental & Maint of Othr Equipment	2,000	6,000	6,000	6,000	20,000	2I		
				74500	Miscellaneous Expenses	1,710	8,200	8,263	3,360	21,533	2J		
								Sub-total LDCF	115,688	621,557	692,482	360,703	1,790,430
				Sub-total Outcome 2	115,688	621,557	692,482	360,703	1,790,430				
OUTCOME 3 Investments in cost-effective and adaptive water management interventions and technology transfer	MMERE-WRD / UNDP	62160	LDCF	71200	International consultants	-	58,500	32,500	19,500	110,500	3A		
				71300	Local consultants	60,936	60,936	60,936	60,936	243,744	3B		
				72300	Material & goods	217,000	1,085,000	434,000	434,000	2,170,000	3C		
				72100	Contractual services - Companies	6,000	106,000	90,000	10,000	212,000	3D		
				75700	Training, Workshops and Conferences	-	45,800	52,500	2,500	100,800	3E		
				71600	Travel	2,200	59,910	91,700	66,690	220,500	3F		
				73400	Rental & Maint of Othr Equipment	6,000	6,000	6,000	6,000	24,000	3G		
				74500	Miscellaneous Expenses	2,921	14,221	7,676	5,997	30,815	3H		
								Sub-total LDCF	295,057	1,436,367	775,312	605,623	3,112,359
				Sub-total Outcome 3	295,057	1,436,367	775,312	605,623	3,112,359				

GEF Outcome/Atlas Activity	Responsible Party / Implementing Agency	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	Budget Note
OUTCOME 4 Improved governance and knowledge management for CCA in the water sector at the local and national levels	MMERE-WRD / UNDP	62160	LDCF	71200	International consultants	-	39,000	18,200	-	57,200	4A
				71300	Local consultants	30,285	30,285	30,285	30,285	121,140	4B
				72200	Equipment and furniture	-	41,000	-	-	41,000	4C
				74200	Audiovisual & Print Production Costs	-	8,000	11,000	10,000	29,000	4D
				72100	Contractual services - Companies	-	94,000	58,000	15,500	167,500	4E
				75700	Training, Workshops and Conferences	-	69,900	73,900	72,400	216,200	4F
				71600	Travel	8,275	47,618	28,418	8,275	92,586	4G
				72200	Equipment and furniture	-	-	8,500	6,000	14,500	4H
				74500	Miscellaneous Expenses	578	4,947	3,425	2,137	11,087	4I
					Sub-total LDCF	39,138	334,750	231,728	144,597	750,213	
					Sub-total Outcome 4	39,138	334,750	231,728	144,597	750,213	
				PROJECT MANAGEMENT	MMERE-WRD / UNDP	62160	LDCF	71200	International consultants	-	-
71300	Local consultants	35,700	66,752					56,752	76,752	235,956	PMA
72500	Supplies	4,500	5,000					4,500	4,000	18,000	PMB
74100	Professional services	3,000	3,000					3,000	3,000	12,000	PMC
75700	Training, Workshops and Conferences	6,500	1,500					1,500	1,500	11,000	PMD
71600	Travel	5,148	17,738					4,538	11,988	39,412	PME
72200	Equipment and furniture	9,500	-					-	-	9,500	PMF
73400	Rental & Maint of Othr Equipment	-	-					-	-	-	

GEF Outcome/Atlas Activity	Responsible Party / Implementing Agency	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	Budget Note
				74500	Miscellaneous (DPC)	4,000	4,000	4,000	4,000	16,000	PMH
										-	
					Sub-total LDCF	68,348	97,990	74,290	101,240	341,868	
					Sub-total Outcome PM	68,348	97,990	74,290	101,240	341,868	
Total						874,031	2,727,386	1,936,465	1,312,118	6,850,000	

Summary of Funds: ⁴⁹

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total
GEF	874,031	2,727,386	1,936,465	1,312,118	6,850,000
TOTAL	874,031	2,727,386	1,936,465	1,312,118	6,850,000

⁴⁹ Summary table should include all financing of all kinds: GEF financing, cofinancing, cash, in-kind, etc...

BUDGET NOTES

Budget Note	Description of cost item
Outcome 1	
1A	International Consultant A Support to support PMU, International Consultant B supporting cost benefit analysis. Total for Outcome 1 over 4 years: \$104,000
1B	Technical Adviser (CCA/DRR) @24 months for Years 1, 2, Full time SIWSAP Provincial Officers (x 6): 12 months per years 1, 2 3, and 4, for 6 Provinces Total Outcome 1: \$383,544
1C	n/a
1D	Includes collection of climate change information across Provinces, analysis and summary reporting, translation costs where necessary. Production of Response Plans, and promotion through radio and media, guidance documents preparation and printing on water sector vulnerabilities, and guidance documentation and translation on adaptation needs for Provincial Planning. Total cost \$35,000
1E	Local contractor support to establish the Pilot Project Committees, collection of local climate related information, including through participatory community workshops (for vulnerability assessment), support culturally appropriate workshop design and delivery, training of communities with PMU. Additional consultation support for replication site sourcing, community consultations, information and data collection. Regional water contractor to mobilise water safety planning including site visits, monitoring, source and water quality testing, pumping of groundwater where required to complete adaptation response planning. Total cost \$44,000
1F	Preparation,venue hiring and catering for community consultations, Provincial government consultations, including Gizo and Taro township municipalities for training events, training of trainers in the water vulnerability assessment framework and implementation.
1G	<i>Local Travel</i> National flights/boats costs: Year 1: Flights of provincial officers to travel to Honiara and sites by project team DSA & terminals in Provinces:: PMU staff to travel to 6 sites in Year 1 and Year 2, and provincial officers to attend inception workshop
1H	Communications and audio visual equipment for the delivery of Outcome 1 – but which also is required for delivering all other Outcomes: digital hand held still/video camera x 3, external microphones x 4, tripods x 2, waterproof housing (and carry cases) x 3, software, cabling as required, back up data storage, 9 x memory cards, 3 x extra batteries, 3 x GoPro Hero waterproof cameras. Water quality testing equipment, water flow monitoring equipment (for surface water stream gauging), and calibration. Total \$19,560.
1I	Vehicle hire & fuel as necessary over 4 years.
1J	Approximately 1% of the total Outcome 1 budget for Y1-Y4 is allocated for contingencies related to inflation, current exchange fluctuations and other external shocks and contingencies. These may increase the cost of travel and materials.
Outcome 2	
2A	International Consultant Support for 60 days – groundwater expert (Years 2 and 3) International Consultant Support (\$650/day) for 50 days – hydrologist support (split across Years 2 and 3, and 4). Mainly to work with MHMS-RWSS to better understand climate and hydrology impacts on their interventions. International Consultant Support for 60 days – sanitation expert (Year 2, 3, 4) International Consultant Support for 30 days – early warning specialist Year 2 only. To work with

	<p>communities of establishing CBEWS, working with NDMO. Year 2 only.</p> <p>International Consultant Support for 40 days – watershed management and protection zones for townships and other exposed sites (e.g. Manaoba, Santa Catalina). Years 3 and 4 only</p> <p>International Consultant Support for 40 days – Rainwater Harvesting expert support to evaluate the use of tanks and support and train the PMU. Year 1 and Year 3.</p>
2B	<p>Technical Adviser (CCA/DRR) @2 months for Years 1, 2, and 3, and @7 months for Year 4 Local consultant support for:</p> <p>Rural hygiene/WASH specialist for 30 days Yr, 60 days Yr 3, 30 days Yr 4</p> <p>Urban/rural water supply expert for 30 days Yr 2, 40 days Yr 3</p>
2C	<p>Rainwater tanks for all pilot sites, including townships of Gizo and Taro, 6 replication sites, and investment at MHMS-RWSS site to improve resilience of water supply to climate change for Years 2 and 3.</p> <p>Building materials – roofing, timber, guttering, downpipes, taps, for rainwater harvesting in Years 2, 3, and 4.</p> <p>Aggregate material for baseplate construction under strategic RWH tanks (as in some locations this is difficult to source): in Years 2 and 3</p> <p>Logistics and shipping costs for materials in 4 years.</p> <p>Fencing and tools in years 2 and 3</p> <p>Piping and other materials for water source rehabilitation</p> <p>PES/water fund seed funding (to start the process off and demonstrate the approach in Year 2</p> <p>Hydroclimate monitoring equipment: simple raingauges and other equipment mainly to be used at pilot site and replication location with communities for demonstration and training purposes with Provincial Officers and Provincial Administrations – for looking at rainfall documentation relative to rainwater catchment etc – to allow calculation of approximate tanks sizes for years 2 and 3.</p>
2D	<p>Provincial guidance documents and radio programme development during Years 3 and 4.</p> <p>Development of radio programme, airtime, interviews, and preparation of guidance material, printing.</p>
2E	<p>Local/Regional contractor for groundwater surveys at pilot sites, replication sites and other sites determined with partners for surveys into size and reliability of water sources, quality of water, establish pumping regimes and management plans. Includes all materials, logistics. Local contractor for solid waste removal at Taro – logistics, boat hire, safe removal and disposal.</p> <p>Local/Regional contractor for sanitation surveys, community engagement, latrine construction, latrine trials, appropriate latrine design and construction, minor community campaigns at pilot sites, active and continuous engagement with communities for sanitation behavioural change (including documentation, development of training material).</p> <p>Local contractor for feasibility studies for source rehabilitation at different pilot sites, including additional sites requested by Provincial Government and MHMS-RWSS and MMERE-WRD.</p> <p>Local contractors at provincial level for RWH installations.</p> <p>Local contractor for rehabilitation of reservoir and sand filters at Gizo, including upgrades to the reservoir and protection zone.</p>
2F	<p>Training for Rainwater harvesting construction and maintenance and water quality testing across Provinces.</p> <p>Sanitation promotion workshops and training across Provinces and administrations.</p> <p>National Sanitation Campaign Development and Promotion.</p> <p>Climate change budgeting development for 6 sites, including MHMS-RWSS sites – costing adaptation needs.</p> <p>Plumbing, basic maintenance training for communities with Government partners and MHMS-RWSS and MMERE-WRD and for follow-up training across Provinces.</p> <p>Community consultation costs : catering, logistics, venue hire, communications costs:</p> <p>Community Based Early Warning System training across pilot sites and wider across Provinces</p>

	with Provincial Government and NDMO. Provincial Administration training costs (for all project aspects, specific training with administration and authorities through the project on adaptation , vulnerability assessment, groundwater risks, water quality management, disaster risk reduction, CBEWS, etc.:
2G	Travel cost and DSA for consultants over 4 years.
2H	2 x GPS units for Rainwater Harvesting survey recording and Equipment.
2I	Vehicle hire & fuel includes boats and access and support logistics to MHMS-RWSS sites and other sites supported through EU and AusAID funding.
2J	Approximately 1% of the total Outcome 2 budget for Y1-Y4 is allocated for contingencies related to inflation, current exchange fluctuations and other external shocks and contingencies. These may increase the cost of travel and materials.
Outcome 3	
3A	International Consultant Support for 40 days – groundwater expert. International Consultant Support for 40 days – hydrologist support. International Consultant Support for 30 days – watershed management expert International Consultant Support for 60 days – watershed management expert
3B	Technical Adviser (Water) @3 months for Years 1, 2, 3 and 4 Local consultant support at Provincial level with community engagement: 3 months/year for 4 years
3C	See Table 5, page 58
3D	Local contractor support to source materials for 20 investment sites, provide logistics and transport to mobilise equipment. Construction costs for over 20 sites, erosion control, toilet construction, water tank installation, rainwater catchments, fencing. Contractor for groundwater assessments at 20 sites, pumping tests, groundwater surveys and quality testing, working with Government. (equipment logistics, travel, staffing costs) Local Sub-contract for materials at baseline sites across Provinces under implementation from co-financers, and to support MHMS-RWSS specifically at their sites funded by sector support funding (EU and AusAID). This will include construction costs, instalment of equipment (labour, carpentry), travel costs associated, shipping, minor construction costs.
3E	Preparation, hiring and catering for community consultations at the 20 investment sites. Provincial workshop on year 3, per Province, to highlight investment site interventions, bring communities together to share lessons and experience. Mobilisation of Guidance documents and Provincial Planning on Adaptation include cost analysis training. Rainwater harvesting training in rainwater calculation assessments, GPS location of tanks, sizing, development of RWH database. Training costs with Regional Partner:
3F	Travel cost and DSA for consultants over 4 years.
3G	Provincial Officer establishment, securing accommodation, laptops (x 6), printers (x6), telephone connections, software, licences, minor furniture to support office establishment with Provincial Administration.
3H	Approximately 1% of the total Outcome 1 budget for Y1-Y4 is allocated for contingencies related to inflation, current exchange fluctuations and other external shocks and contingencies. These may increase the cost of travel and materials.
Outcome 4	
4A	International Consultant Support for Sanitation 20 days: International Consultant Support to assist in the development of the National output on climate

	<p>change impacts on the water resources of the Solomon Islands.</p> <p>International Consultant Support for Hydro-meteorological monitoring/siting/.</p>
4B	<p>Project Manager @ 2 months per year for 4 years specifically associated with the National Water and Adaptation Forum, and the Sanitation and Adaptation Partnership</p> <p>Technical Adviser (Water) @2 months for 4 Years</p> <p>Technical Adviser (CCA/DRR) @1 months for 4 Years</p> <p>Procurement Assistant: 2 months per year for 4 years</p> <p>Full time SIWSAP Provincial Officers (x 6): 2 months per years 1, 2 3, and 4, for 6 Provinces</p> <p>Total Outcome 4: \$121,140</p>
4C	<p>Campbell Scientific Hydro-Meteorological monitoring sites for 4 sites.</p> <p>Loggers, and other communication options:</p> <p>Cabling and access costs (to land):</p> <p>All costs for Year 2.</p> <p>Note the equipment will be specified by MMERE-WRD and MECDM, with consultant and partnership agency support.</p>
4D	<p>Guideline development and publication/printing costs, including preparation of materials for the National Water and Adaptation Forum.</p>
4E	<p>Contractor support to:</p> <p>Develop a series of SIWSAP training videos in mobilising and using the adaptation response plans, and technical videos on topics such as rainwater harvesting, groundwater protection, compost toilet construction etc. based on video filming, working with and supporting communities in gathering video material, working with contractors to film, developing scripts, editing, final preparation. Promotion of videos. These costs are based on regionally applicable costs from other project.</p> <p>Contracting in of specialist advocacy services for theatre and radio communications (regionally available). (including travel to and around the Solomon Islands as necessary);</p> <p>Develop of a national sanitation advocacy campaign. It is anticipated that this may require international support and this is covered under the international consultant element of the budget for Outcome 4. Local contractor support will be required for the production of materials, printing, messaging, and other campaign activities including supporting the branding of the project, preparation of material suitable for radio and television (stories, messaging, speeches for World Water Day for example), posters, leaflets, etc – the development of a critical mass of information from and for the project.</p> <p>Local Contractor support to establish demonstrations of new sanitation approaches such as eco-sanitation/composting toilets (including materials, construction costs, and associated travel and transport costs. (including materials, construction costs, and associated travel and transport costs).</p> <p>Contractor support to install hydro-meteorological equipment at 4 sites, and for maintenance and monitoring visits of existing sites to support MMERE-WRD. This will include getting the services in-country and costs incurred during the work (local travel costs, DSA, hiring of equipment, purchase of local equipment needs and small construction services for installation, including labour).</p>
4F	<p>Preparation, hiring and catering for the National Water and Adaptation Forum during Years 2, 3, and 4 of project implementation for approximately 120 people. This will include venue hire, catering, technical equipment hire, and logistics specifically for Forum preparation i.e. (PA system), miscellaneous costs. The Forum will run for 3 days, but will have meetings and training sessions around the Forum for a further 2 days for specific SIWSAP implementation as detailed under Outcome 4.</p> <p>Training costs under Outcome 4 will include:</p>

	<p>Facilitation support for the National Water and Adaptation forum</p> <p>Training of trainers with local consultant support following material presented at the Forum for Years 3 and 4 only (rolling out specific project outputs in support of the training videos using practical demonstrations)</p> <p>Scholarship costs for the course to be developed with the National University including travel for students in Provinces)</p>
4G	Travel cost and DSA for consultants over 4 years.
4H	Equipment and some minor furniture costs for the development of the National Diploma course/program with the National University. This includes minor computing costs and some equipment for the university to develop a host the course.
4I	Approximately 1% of the total Outcome 1 budget for Y1-Y4 is allocated for contingencies related to inflation, current exchange fluctuations and other external shocks and contingencies. These may increase the cost of travel and materials.
Project Management Cost	
PMA	<p>Project Manager full time salary for 4 years covering 30 months – as other costs are included under technical delivery</p> <p>Financial/Administrative Assistant Full time salary for over 4 years (45 months taking into consideration hiring):</p> <p>Procurement Assistant Full time salary for over 4 years (42 months considering hiring):</p> <p>MT and Final Evaluation: (co-financing may need to be identified)</p> <p>Total Project Management: \$235,956</p>
PMB	Office supplies
PMC	Professional Services: audit
PMD	Inception workshop. Board meeting costs.
PME	Travel cost and DSA for consultants over 4 years.
PMF	PMU office establishment, including laptops (x 5), printer, telephone and fax, projector, screen, software, licences,
PMG	Approximately 1% of the total Outcome 1 budget for Y1-Y4 is allocated for contingencies related to inflation, current exchange fluctuations and other external shocks and contingencies. These may increase the cost of travel and materials.
PMH	<p>Direct Project Services (DPS) refers to project ‘execution services’ which UNDP provides at the request of government to support the procurement of goods and services, recruitments, payments, etc. The services are charged on an item by item basis against UNDP’s Universal Price List (UPL). The estimated items that will be costed under the DPS include:</p> <ul style="list-style-type: none"> • Recruitment, HR management and administration, and salary payments of project management staff • Approximately recruitment of 20 short-term positions envisaged in the four components of the project as well as M&E related consultants • Travel authorization • Procurement of equipment/materials • Procurement of equipment/materials

V. MANAGEMENT ARRANGEMENTS

272. The Solomon Islands Government will execute the project with the support of UNDP under **the National Implementation Modality (NIM)**.

Implementing Partner (IP)

273. The Ministry of Mines, Energy and Rural Electrification (MMERE), and specifically the Water Resources Division, will be the Implementing Partner and the main executing institution responsible for ensuring that the objectives and components of the project are delivered as it is detailed in this project document.

Responsible Party (RP)

274. Upon request from the Solomon Island Government through a Letter of Agreement (LoA), UNDP, as one of the Responsible Party to the project, will provide the necessary support to the project in order to maximize its reach and impact as well as the quality of its products. Moreover, UNDP will assist MMERE to disburse funds through the Project Management Unit (PMU), which will be dedicated to the Project in keeping with its key principles of transparency, competitiveness, efficiency and economy. The financial management and accountability for the resources allocated, as well as other activities related to the execution of Project activities, will be undertaken by the PMU in close consultation with MMERE and under the supervision of the UNDP Honiara Sub-Office and Fiji Multi-Country Office. UNDP will undertake the monitoring of the Project and of evaluation activities, taking into account from the outset local capacities for administering the project, capacity limitations and requirements, as well as the effectiveness and efficiency of communications between ministries and other institutions that are relevant to the project. The specific areas of support and its costs will be outlined in the LoA between MMERE and UNDP prior to project start.

Project Board (PB)

275. A **Project Board** will be established consisting of MMERE (Executive/Implementing Partner), UNDP (Senior Supplier/Managing Entity/Responsible Party), MECDM, MHMS-EHD, and MDPAC (Beneficiaries). These four agencies will be permanent members of the Project Board, but will be assisted by representation from the National Climate Change Working Group (CCWG), and the National Intersectoral Water Coordination Committee (NIWCC) as invited members. The Project Board will be responsible for making management decisions and strategic guidance to the project, and will support the Project Director and Project Manager in decision making where required. The Board will approve the Annual Workplan and Budget for the project, set different tolerances for the work, and will approve any necessary deviations from the original approval plans. In order to ensure UNDP's ultimate accountability for the project results, Project Board decisions will be made in accordance to standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition.

276. The Project Board plays a critical role in project monitoring and evaluations by quality assurance of the project processes, procedures and outputs, and will use any project evaluations for performance improvement, accountability and learning. The Board will ensure that resources are committed to ensure the project can function, and will arbitrate any conflicts within the project or negotiates a solution to any problems with external bodies and project partners. A Terms of Reference for the Project Board are provided in Annex 7.

An Executive

277. An Executive is an individual who will chair the PB group and represent the project ownership. This will be the most senior official from the ministerial level of MMERE Solomon Islands.

Senior Supplier

278. The Project **Senior Supplier** is an individual or group representing the interest of the parties concerned which provide funding for specific cost sharing projects and/or technical expertise to the project. The

Senior Supplier's primary function within the PB is to provide guidance regarding the technical feasibility of the project. The Senior Supplier for this project will be represented by UNDP, who is held accountable for fiduciary oversight of LDCF resources in this initiative. The UNDP Deputy Resident Representative based in the Solomon Islands will represent UNDP.

Senior Beneficiary

279. The Project **Senior Beneficiary** is an individual or group of individuals representing the interest of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the PB is to ensure the realization of project results from the perspective of the project beneficiaries. The Senior Beneficiary for this project will be represented by MECDM, MHMS-EHD, and MDPAC.

Project Advisory Group

280. The Project Board will be guided by a **Project Advisory Group**. The Advisory Group will consist of key relevant national stakeholders including the National Disaster Management Office (NDMO), the Ministry of Development Planning and Aid Coordination (MDPAC), and relevant donors⁵⁰ who provide co-financing and support to the project, together with Provincial Government Representative(s) as project partners and beneficiaries. It is also recommended that national representatives from the World Bank funded Rural Development Programme are part of the Advisory Group. The experience of the Rural Development Programme concerning infrastructure investments, working with communities on different projects, including rural water supply and sanitation and floor risk assessment is valuable expertise to support and advise the SIWSAP PMU. They will be joined by the National Climate Change Working Group (CCWG) and the National Intersectoral Water Coordination Committee (NIWCC) if CCWG and NIWCC are not already, through invitation, members of the Project Board. The newly developed Water Supply, Sanitation and Hygiene (WASH) Stakeholder Group will also be invited to sit in the Advisory Group, with their key experience in rural WASH⁵¹. A Key role for MDPAC in the Advisory Group is to learn positive and negative lessons from the project to improve project planning in the future, but to also identify new areas requiring project and sector wide investment to ensure SIWSAP interventions and results feed into national level sustainability planning. The Advisory Group will provide information and recommendations to the PB. A Terms of Reference for the Project Advisory Group are provided in Annex 7.

Project Director

281. A **Project Director** will be appointed to oversee overall project implementation on a regular basis, and to ensure that where institutional support is required within MMERE it is adequately provided for the project to fulfil the objectives set. The Project Director will be the Permanent Secretary (or person designated by him/her) of MMERE, who will act as the Chair of the Project Board. The Project Director will be responsible for raising project awareness and ownership across the Solomon Island Government institutions, and where necessary will represent the project at the national level. The Project Director will be responsible for ensuring the achievement of results and transfer of knowledge and project learning from the project to the Project Board, most particularly to the national and provincial government entities.

Project Management Unit (PMU)

1. A **Project Management Unit (PMU)** will be established within the Water Resources Division of MMERE in Honiara. The PMU will provide technical, administrative, and management functions to coordinate and implement the project on a day-to-day basis, in collaboration with MMERE-WRD, MHMS-EHD, and the Provincial Officers and Provincial Administration⁵². The PMU will administer the project in accordance with

⁵⁰ Specifically AusAID and the EU as the main funders of rural water supply and sanitation work at present through the AusAID Solomon Islands Access to Water and Sanitation Initiative (SIACWSI), and the EU Sector Reform contract on Improving Governance and Access to WASH for Rural People. UNICEF will also provide assistance as an Advisory Group through their project Building Human Development: Improving WASH in the Solomon Islands, funded by the EU Water Initiative.

⁵¹ The purpose of this group is to coordinate activities for the rural WASH sector across the country, and to gather knowledge and experience from across the sector as part of a learning agenda.

⁵² Learning from previous projects, the PMU will be required to provide project guidance, support and administrative assistance. To actively do this it must have technical capabilities to facilitate supporting the pilot projects, and also the correct management abilities to

the rules, policies, and procedures of UNDP, GEF, LDCF, and the Solomon Islands Government as agreed to by the Project Board. In situations where conflicting/or mutually exclusive rules and procedures arise, the Project Board will provide solutions worked out on a case-by-case basis, to ensure project implementation continues. The Project Director will ensure that matters are dealt with quickly and efficiently working as the bridge between the Solomon Islands Government and UNDP. It is envisaged that the CCWG and NIWCC will liaise closely with the PMU to support project implementation. The PMU will, among other tasks, 1) develop Standard Operating Procedures (SIWSAP PMU Guidance Manual⁵³) for project implementation, 2) develop Quarterly and Annual Work Plans and Reports, 3) provide financial and administrative management support, 4) prepare Quarterly and Annual Financial and Technical Progress Reports to be submitted to MMERE and the PB, and 5) ensure compliance with applicable UNDP/GEF/LDCF/Government rules and regulations.

282. The PMU will receive required training in UNDP procedures from the UN Joint Presence office in Honiara, upon the establishment of the PMU. Sufficient office space for PMU members and project consultants will be provided by MMERE-WRD. Terms of Reference for the PMU is included in Annex 7.

Project Manager (PM)

283. The PMU will be headed by a nationally recruited **Project Manager**, where s/he will have the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the PB. Among others, the PM's prime responsibility is to ensure that the project produces the results specified in the Project Document, to the required standard of quality and within the specified constraints of time and cost. The PM will report directly to the Project Board, and will manage four (4) other staff that are part of the PMU. S/he will be hired through a competitive selection process. Terms of Reference for the PMU is included in Annex 7.

Technical Advisors (TA)

284. The project will hire the following two national technical advisors to provide technical expertise to the project:

- **Technical Adviser – Water Specialist** [Professional Adviser position]
The Water Specialist will assume direct responsibility for the rural water supply and sanitation technical interventions and wider water (and ground water) management aspects. They will work closely with the other technical adviser to deliver the project Outcomes. (ToR included in Annex 7)
- **Technical Adviser – Climate Change Adaptation and Disaster Risk Reduction Specialist** [Professional Adviser position]
The Climate Change Adaptation and Disaster Risk Reduction Specialist (ADRM) Specialist will assume direct responsibility for the adaptation aspects of the project, and elements concerned with disaster risk reduction. They will work closely with the other technical adviser to deliver the project Outcomes. (ToR included in Annex 7)

Project Assistants

285. The project will hire the following two national project assistants to provide effective administrative and operational support to the project:

- **Finance and Administrative Assistant** [Technical/Administrative Support position]
The Finance and Administration Assistant will assume direct responsibility for the day-to-day financial management of the project, under the supervision of the Project Manager. S/he will also perform

administer the project financially and technically.

⁵³ A project SOP or Guidance Manual will be developed within the inception period by the PMU supported by UNDP. The manual will contain specific guidance on Procurement of both technical consultancy services and equipment, building on lessons from the SWoCK Project (Strogem Woka lo Community fo Kaikai) implemented by UNDP. A mechanism will be explored within the SOP/manual development process so that expert support can be contracted in from regional CROP Agencies and other organisations across the region who can advise the PMU on equipment needs, technical equipment Terms of Reference development and Bill of Quantities as required.

project administrative duties, travel logistics national, regional, and international where required. The officer will support the delivery of the project Outcomes, and will also support the development of project technical and financial reports, and the annual workplans. This officer will also need to support procurement procedures, including for equipment and professional consulting services.

- **Procurement Assistant** [Technical/Administrative Support position]
The Procurement Assistant will provide support to the PMU in all procurement matters including the implementation of sourcing strategies, control of project assets, assisting in logistical services and support to knowledge sharing within the PMU and MMERE on UNDP Procurement guidelines. The Procurement Assistant will also be responsible for performing key Atlas functions to ensure that goods and services are delivered in an effective and efficient manner to realise project goals.

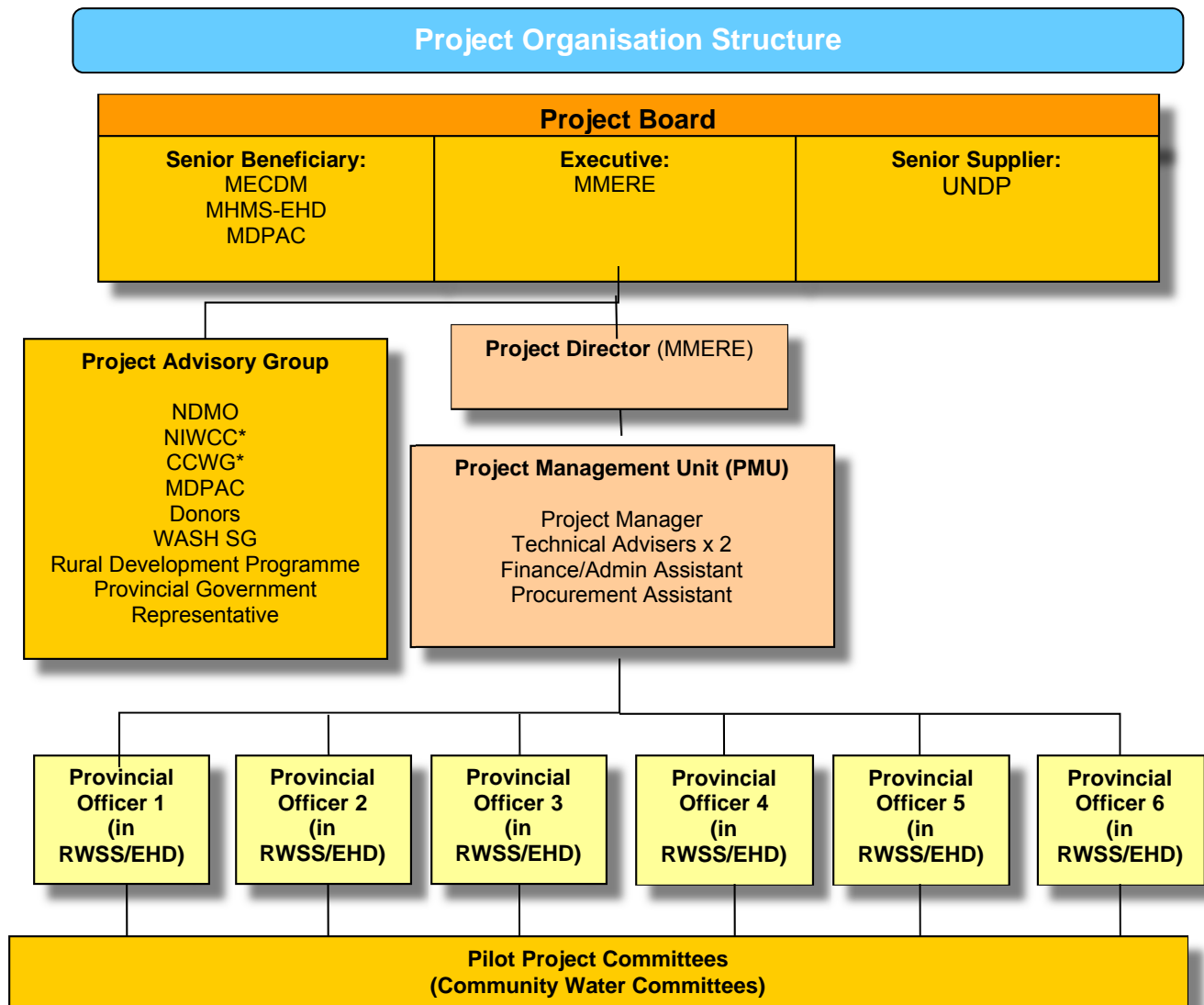
SIWSAP Provincial Officers

286. Although not part of the PMU in Honiara, the PMU will recruit technical officers within each of the pilot Provinces involved in the project. These officers have a multi-functional role. They will coordinate and implement activities at pilot site level, possible replication site levels, and at any strategic investment sites. They must work closely with beneficiary communities and the Provincial Government and Agencies to ensure the interventions are appropriate, and that the project activities are signed-off by MHMS-EHD to ensure policy and technical compliance. These positions are key roles, needing skills in working with agencies and communities, and management of project interventions. These positions will report directly to the PMU, but will also report to the Provincial Government to ensure clear communications and transparency⁵⁴. A generic Terms of Reference is provided for this role in Annex 7. It is envisaged that these individuals will be highly valuable resources to the Solomon Islands Government at the end of the project.

Pilot Project Committees

287. Where appropriate, Pilot Project Committees (PPC) will be established at the level of the pilot projects. The committee will be constituted building on existing Provincial and community level water management mandate and institutions, such as the RWSS/EHD in the provinces as well as the Community Water Communities at the community level). The PPC will help guide activities within each pilot project, and where possible help implement the activities through provision of materials, labour, etc. In reality, due to the strong sense of community and kinship in the country, formal 'committee establishment' may be unlikely. The communities are the ultimate beneficiaries, and it is critical that they are involved in helping to scope out intervention needs, capacity needs and to also provide their knowledge and experience of dealing with water shortages, floods, storms, and other impacts captured in community history and stories. In some cases it is expected that local partners (NGO's for example) and Provincial Government will coordinate with the community beneficiaries and the SIWSAP Provincial Officer(s) for project activities and logistical support where needed. These groups, as 'Committees' will guide and coordinate, with the SIWSAP Provincial Officer(s) pilot site interventions. A generic Terms of Reference is provided for the PPCs in Annex 7.

⁵⁴ Project SOP/SIWSAP PMU Guidance Manual will indicate reporting lines and the frequency of reporting.



Contractors

288. The implementation of the components of the project will be supported by contractors, selected according to UNDP procurement rules. The Implementing Partner may contract other entities, defined as Responsible Parties, to undertake specific project tasks through a process of competitive bidding. In the case of community based organisations supplying implementation support, they would need to be registered as per national requirements with the appropriate Ministry. However, if the Responsible Party is another government institution, Inter-Governmental Organisation (e.g. a CROP Agency) or a United Nations agency, competitive bidding will not be necessary and direct contracting will be applied. **Direct contracting to be processed by UNDP will follow UNDP financial rules and regulations as it needs to comply with certain criteria, such as comparative advantage, timing, threshold, budgeting and quality.** If direct contracting criteria cannot be met the activity will be open to competitive bidding.

Project assurance

289. Project Assurance is the responsibility of each Project Board member, namely MMERE, UNDP, the Ministry of Environment, Climate Change and Disaster Management Meteorology (MECDM), and MHMS-EHD. The Project Assurance role supports the Project Board by carrying out objective and independent project oversight and monitoring function. This role ensures appropriate project management milestones are managed and completed. Project Assurance has to be independent of the Project Manager; therefore the Project Board cannot delegate any of its assurance responsibilities to the Project Manager. A UNDP

Programme Officer typically also holds the Project Assurance role. The following list includes the key aspects of project assurance to be performed throughout the project as part of ensuring that the project remains relevant, follows the approved plans and continues to meet the planned targets with quality:

- a) Maintenance of thorough liaison throughout the project between the members of the Project Board to ensure that the beneficiary needs and expectations are being met or managed, that the identified project risks are being controlled, and that the project remains justified and the business case is sound.
- b) Furthermore, the assurance responsibilities must also ensure that the project continues to 'fit' within the overall Country Programme, that the project works with the most appropriate people, and that activities are sensible and the most appropriate for the tasks. 'Mission' creep of the project must be checked should it appear to be happening, and internal (within the project) and external to the project communications must be monitored to ensure the project actively engages with partners and stakeholders and lessons learned are shared as early as viable.
- c) Finally, the assurance process must ensure at all times that national legislation and applicable UNDP rules and regulations are observed at all times, and agreed quality assurance procedures and 'sign-off' is occurring as specified in the SIWSAP PMU Guidance Manual.

290. Specifically for UNDP, the assurance responsibilities include advising on the strategy implementation for the project, including the design and methods of the project activities, to monitor potential changes to the project and their impact on the quality of deliverables from a supplier perspective, to monitor any risks in the implementation of the project, to monitor progress against the Annual Workplan and Quarterly and Annual Budget reporting, and to ensure that the mid-term and terminal evaluations are conducted in a timely and professional manner. UNDP must also ensure that, given the logistical challenges in the Solomon Islands, in implementing the project, full due care and attention is paid to health and safety concerns of project staff.

291. The assurance responsibilities of the MECDM and MHMS-EHD as the Project Beneficiaries are to check that the needs of the beneficiary's are accurate, complete and unambiguous in the project outcomes and outputs, and through the implementation of activities. They must also ensure that the project is adequately monitored, and the results of this are regularly reported to the Project Board. Any changes to the project must be viewed from the potential impact on project beneficiaries, and any risks to them that may arise must be identified, monitored, and mitigated as far as possible.

Audit arrangements

292. Audit arrangements will be conducted in accordance with the UNDP NIM Audit policies and procedures, and based on the UN Harmonized Approach to Cash Transfer (HACT) policy framework. Annual audit of the financial statements relating to the status of UNDP (including GEF) funds will be undertaken according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by a special and certified audit firm. UNDP will be responsible for making audit arrangements for the project in communication with the Project Implementing Partner. UNDP and the project Implementing Partner will provide audit management responses and the Project Manager and PMU will address audit recommendations. As a part of its oversight function, UNDP will conduct audit spot checks at least two times a year.

UNDP Country Support Services

293. As per the standard agreement between UNDP and the Solomon Islands Government, and upon request from the Implementing Partner (IP), the UNDP Country Office may provide the following support services for the activities of this project, and recover the actual direct and indirect costs incurred by the Country Office in delivering such services as stipulated in the LOA:

- a. Payments, disbursements and other financial transactions
- b. Recruitment of staff, project personnel, and consultants
- c. Procurement of services and equipment, including disposals
- d. Organization of training activities, conferences, and workshops, including fellowships
- e. Travel authorization, Government clearances ticketing, and travel arrangements
- f. Shipment, custom clearance, and vehicle registration.

Intellectual Property Rights

294. Intellectual Property Rights will be retained by the employing organization of the personnel who develops intellectual products, either Government, or UN/UNDP in accordance with respectively national and UN/UNDP policies and procedures.

VI. MONITORING FRAMEWORK AND EVALUATION

295. The project will be monitored through the following Monitoring and Evaluation (M&E) activities. The estimated M&E budget is provided in the table below. The M&E framework set out in the Project Results Framework in Part III of this project document is aligned with the AMAT and UNDP M&E Frameworks.

296. **Project start:** A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

297. The **Inception Workshop** should address a number of key issues including:

- a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and UNDP-GEF/Regional Coordination Unit (RCU) staff vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- b) Based on the project results framework and the relevant GEF Tracking Tool (AMAT) if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- c) Provide a detailed overview of reporting, M&E requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.
- e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

298. An **Inception Workshop report** is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

299. Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc... The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

300. **Annually: Annual Project Review/Project Implementation Reports (APR/PIR):** This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and SOF (e.g. GEF) reporting requirements.

301. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice (reported in narrative, photographic, and/or audiovisual formats)
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR
- Portfolio level indicators (i.e. GEF focal area tracking tools)

302. **Periodic Monitoring through site visits:** UNDP CO and the UNDP GEF region-based staff will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR (combining various formats including narrative, photographic, and/or audio-visual i.e. video BTOR) will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members. Wherever possible and if appropriate, innovative M&E approaches such as those outlined in the UNDP discussion paper on "Innovations in Monitoring and Evaluating Results"⁵⁵ (UNDP, 2013)" will be utilized.
303. **Mid-term of project cycle:** The project will undergo an independent **Mid-Term Evaluation** at the mid-point of project implementation (end of 2nd year of the project). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the [UNDP Evaluation Office Evaluation Resource Center \(ERC\)](#). Wherever possible and if appropriate, innovative M&E approaches such as those outlined in the UNDP discussion paper on "Innovations in Monitoring and Evaluating Results (UNDP, 2013)* will be utilized. The LDCF/SCCF AMAT as set out in the Project Results Framework (in Section III of this Project Document) will also be completed during the mid-term evaluation cycle. .
304. **End of Project:** An independent [Final Terminal Evaluation](#) will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and SOF (e.g. GEF) guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. Wherever possible and if appropriate, innovative M&E approaches such as those outlined in the UNDP discussion paper on "Innovations in Monitoring and Evaluating Results (UNDP, 2013)* will be utilized.
305. The **Final Evaluation** should also provide recommendations for follow-up activities and requires a management response, which should be uploaded to PIMS and to the [UNDP Evaluation Office Evaluation Resource Center \(ERC\)](#). The LDCF/SCCF AMAT as set out in the Project Results Framework (in Section III of this Project Document) will also be completed during the terminal evaluation cycle.
306. During the last three months, the project team will prepare the **Project Terminal Report**. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.
307. **Learning and knowledge sharing:** Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums, including but not limited to UNDP Adaptation Learning Mechanism (www.undp-alm.org/).
308. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.
309. Furthermore, two-way flow of information between this project and other projects of a similar focus will be encouraged and facilitated throughout the lifespan of the Project implementation.

⁵⁵ <https://undp.unteamworks.org/file/370238/download/403529>

310. **Audit:** The Project will be audited in accordance with UNDP Financial Regulations, Rules, and applicable policies.

M&E workplan and budget:

Type of M&E Activity	Responsible Parties	Budget US\$ Excluding project team staff time	Time Frame
Inception Workshop and Report	<ul style="list-style-type: none"> ▪ Project Manager ▪ UNDP CO, UNDP CCA 	10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> ▪ UNDP CCA RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members. 	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on <i>output and implementation</i>	<ul style="list-style-type: none"> ▪ Oversight by Project Manager ▪ Project team 	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> ▪ Project manager and team ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG 	None	Annually
Periodic status/progress reports	<ul style="list-style-type: none"> ▪ Project manager and team 	None	Quarterly
Mid-term Evaluation	<ul style="list-style-type: none"> ▪ Project manager and team ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team) 	Indicative cost: 40,000	At the mid-point of project implementation.
Final Evaluation	<ul style="list-style-type: none"> ▪ Project manager and team, ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team) 	Indicative cost: 40,000	At least three months before the end of project implementation
Project Terminal Report	<ul style="list-style-type: none"> ▪ Project manager and team ▪ UNDP CO ▪ Local consultant 	0	At least three months before the end of the project
Audit	<ul style="list-style-type: none"> ▪ UNDP CO ▪ Project manager and team 	Indicative cost per year: 3,000 (12,000 total)	Yearly
Visits to field sites	<ul style="list-style-type: none"> ▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives 	For GEF supported projects, paid from IA fees and operational budget	Yearly
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US\$ 102,000 (+/- 5% of total budget)	

311. **Communications and visibility requirements:** Full compliance is required with UNDP's Branding Guidelines. These can be accessed at <http://intra.undp.org/coa/branding.shtml>, and specific guidelines on UNDP logo use can be accessed at: <http://intra.undp.org/branding/useOfLogo.html>. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The [GEF logo](#) can be accessed at:

[http://www.thegef.org/gef/GEF logo.](http://www.thegef.org/gef/GEF_logo)
[http://intra.undp.org/coa/branding.shtml.](http://intra.undp.org/coa/branding.shtml)

The [UNDP logo](#) can be accessed at

312. Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"), which be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.
313. Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

VII. LEGAL CONTEXT

314. This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.
315. Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.
316. The implementing partner shall:
- put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
 - assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.
317. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.
318. The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.
319. The UNDP Deputy Resident Representative in Solomon Islands is authorized to effect in writing the following types of revisions to this Project Document, provided that s/he has verified the agreement thereto by the UNDP Regional Coordinating Unit and is assured that other signatories to the Project Document have no objections to the proposed changes:
- Revision of, or addition to, any of the Annexes to the Project Document;
 - Revision which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
 - Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
 - Inclusion of additional attachments only as set out here in the Project Document

VIII. ANNEXES

- Annex 1: Climate Change in the Pacific: Scientific Assessment and New Research - Volume 2: Country Reports - Chapter 13: Solomon Islands
- Annex 2: PPG Inception Workshop Report
- Annex 3: Criteria for Pilot Site Selection
- Annex 4: Summary of Key Thematic Messages Linked to the Pacific Regional Action Plan
- Annex 5: Pilot Site Reports
- Annex 6: Communications Approach for SIWSAP
- Annex 7: Terms of Reference for Project Governance, Management Arrangements, and Key Project Staff
- Annex 8: Stakeholder Engagement Plan
- Annex 9: Project Implementation Schedule
- Annex 10: Adaptation Monitoring and Assessment Tool
- Annex 11: UNDP Risk Log
- Annex 12: References
- Annex 13: Co-finance Letters of Support
- Annex 14: UNDP Environmental and Social Screening
- Annex 15: Responses to Project Reviews
- Annex 16: Resilience Framework