European Union

Water and Sanitation Sector Plan 2016-2020

Ministry of Natural Resources and Environment

WATER FOR LIFE

WATER &SANITATION SECTOR PLAN: FRAMEWORK FOR ACTION 2016 - 2020

Water & Sanitation Sector

Our Long Term Outcome

"Reliable, clean, affordable water and improved sanitation within the framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty"

National Apex Body
Joint Water and Sanitation Sector Steering Committee (JWSSSC)

Implementing Agencies
Ministry of Natural Resources and Environment (MNRE)
Ministry of Health (MoH)
Ministry of Works Transport and Infrastructure (MWTI)
Ministry Women, Community and Social Development (MWCSD)
Samoa Water Authority (SWA)
Land Transport Authority (LTA)
Samoa Tourism Authority (STA)
Independent Water Schemes Association (IWSA)
Samoa Red Cross Society (SRCS)
Plumbers Association of Samoa (PAS)

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Preface

Water is a necessity of life. It is vital for human livelihood, maintaining the environment and its ecosystems and sustaining social and economic developments. Given the more prominent impacts of climate change, there is an alarming need to protect and manage our water resources in a more integrated manner through the 'ridge to reef' approach to increase and improve the resilience of our water catchment and water shed areas to extreme weather events. This will help to secure a more sustainable supply of water for the people of Samoa in the forthcoming years. Cross-sectorial synergies with related sectors such as the environment, energy, agriculture, health, education and other key sectors are embraced by the sector and must be clearly understood and carefully managed.

Over the last four years, the sector has been working hard to address some of these challenges focusing on areas at which it can provide value. The evaluation of the sector's performance in the last four years are summarised in the present plan: *Water for Life*: Water and Sanitation Sector Plan 2016-2020. The review of the sector's progress as per the previous sector plan (Water for Life Sector Plan 2012-2016) has indicated a number of key challenges at which the sector needs to address in this plan for the next four years which include; climate change impacts on water resources, the need to expand the water resources national hydrometric network, IAs capacity gaps and the need for greater awareness on hygiene and sanitation issues. Further challenges include; the inadequate sector budget allocations, NRW and the need to improve the quality and maintenance of septic tanks. To address these challenges, the sector will continue to strengthen its work in Integrated Water Resources Management by strengthening its resilience and preparedness to the impacts of climate change and disasters as well as exploring further financing avenues for further improvements to water supply and sanitation development and related governance issues.

The Water for Life: Water and Sanitation Sector Plan 2016-2020 has been prepared to guide the developments of the sector over the next four years. The overarching development goal for the sector is "**Reliable, clean, affordable water and improved sanitation within the framework of Integrated Water Resources Management for a resilient Samoa, sustaining health and alleviating poverty"** which further reaffirms and underpins the achievement of the national renewed vision of **"Improved Quality for All".** Moreover, it will drive the achievement of Samoa's post 2015 global Sustainable Development Goal 6: **Ensure the availability and sustainable management of water and sanitation for all.**

To ensure the successful delivery of its programme, the sector will work closely with its key development partners, business and civil society to address identified water challenges. The Sector also gratefully acknowledges the contribution of its development partners for their continuous technical and financial support through the budget support system and other projects.

Water is life and is fundamental to human and economic developments. Hence, investing in water is investingin an ‘improved quality of life for all" indeed and making a big difference in the livelihoods of people, families, communities and nations.

Acknowledgements

The Sector wishes to acknowledge the dedication and contributions of the many stakeholders who have worked with the sector at all levels with the preparation of this plan: Water *for Life: Water and Sanitation Sector Plan 2016-2020*. Their invaluable contributions and constructive engagements have been instrumental in bringing this Sector Policy document into fruition. The Sector further acknowledges Mr Tom Ryan of TW Welch and Partners for facilitating the review and update of the Sector Plan.

Table of Contents

List of Figures

List of Tables

List of Acronyms

ADB	Asian Development Bank
ADWF	Average Dry Weather Flow Capacity
AUA	Apia Urban Area
AusAID	Australian Agency for International Development
BNPL	Basic Needs Poverty Line
BS	Budget Support
CBD	Central Business District
CBOs	Community Based Organisations
CDC	Cabinet Development Committee
CEO	Chief Executive Officer
CSO	Community Services Obligation (Grants)
CSSP	Civil Society Support Programme
DEC	Division of Environment and Conservation
DFAT	Department of Foreign Affairs and Trade (formerly AusAID)
DMO	Disaster Management Office
DWSP	Drinking Water Safety Plan
EDF	European Development Fund
EIB	European Investment Bank
EPC	Electric Power Corporation
EU WF	European Union Water Facility
EU	European Union
FY	Financial Year
GCCA	Global Climate Change Alliance
GEF	Global Environment Fund
GoS	Government of Samoa
HIES	Household Income and Expenditure Survey
IAs	Implementing Agencies
IWRM	Integrated Water Resources Management
IWS	Independent Water Schemes
IWSA	Independent Water Schemes Association
SRC	Samoa Red Cross Association
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Program
JWSSC	Joint Water Sector Steering Committee
KPI	Key Performance Indicators
L/c.d	Litres per capita per day (ie litres water consumed per person daily)
LTA	Land Transport Authority
m/mm	metre/millimetre
MAF	Ministry of Agriculture, Forestry and Fisheries
MCC	Ministerial Coordination Committee
MDGs	Millennium Development Goals
MESC	Ministry of Education, Sports and Culture
MNRE	Ministry of Natural Resources and Environment
MoF	Ministry of Finance
MoH	Ministry of Health
MoU	Memorandum of Understanding

MTEF	Medium Term Expenditure Framework
MWCSD	Ministry of Women, Community and Social Development
MWTI	Ministry of Works, Transport and Infrastructure
NAPA	National Adaptation Plan of Action
NDC	National Disaster Council
NGO	Non-Government Organisation
NRW	Non Revenue Water
OM	Outcomes Map
PAS	Plumbers Association
PMS	Performance Monitoring System
PPCR	Pacific Preparation Climate Resilience
PPTA	Project Preparatory Technical Assistance
PUMA	Planning and Urban Management Agency
PWWA	Pacific Water and Wastes Association
ROU	Rest of Upolu
SAT	Samoan Tala
SBS	Samoa Bureau of Statistics
SDS	Strategy for the Development of Samoa
SMERF	Samoa Monitoring Evaluation Reporting Framework
SNDWS	Samoa National Drinking Water Standards
SOE	State Owned Enterprises
SOPAC	South Pacific Applied Geo Science Commission
Sector Plan	Sector Plan
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SRC	Samoa Red Cross
SROS	Scientific Research Organisation of Samoa
ST	Septic Tank
SUNGO	Samoa Umbrella of Non Government Organisations
SWA	Samoa Water Authority
SWAp	Sector Wide Approach
SWAP	Sector Wide Approach to Planning
TA	Technical Assistance
TOR	Terms of Reference
TSC	Technical Steering Committee
USD	United States Dollars
VIP	Ventilated Improved Pit (latrine)
WALS	Water Abstraction Licensing Scheme
WASH	Water, Sanitation and Hygiene
WaSSP	Water Sector Support Programme
WfL	Water for Life
WMP	Water Management Plan
WRD	Water Resources Division
WSS	Water Supply and Sanitation
WSCU	Water Sector Coordination Unit
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Executive Summary

Background and Context

This, the third edition of the *Water for Life* Sector Plan (covering the period 2016-2020) reflects the progress and achievements of the Samoa water sector since the start of the reform agenda in 2005, and charts the ambitions of the Sector over the next four-year planning period up to 2020. The first *Water for Life* Sector Plan covered the period 2008 to 2012 and prepared the Sector for transition from the EU-funded Water Sector Support Program to a 'sector-wide approach' modality with EU budget support. The second *Water for Life* Sector Plan, covering the 2012 – 2016 planning period, was more comprehensive in scope than its predecessor and reflected the growing importance of hygiene in achieving health and sanitation outcomes, and the importance of an integrated water resources management approach to water resources. This third edition of the *Water for Life* Sector Plan will build on the achievements of previous versions of the Sector Plan and will incorporate a greater awareness of the impact of climate change on the Sector.

Sector Performance Assessment

The Samoan water sector has performed well in the attainment of MDG targets for access to improved water and sanitation services. The results of a national survey have indicated that:

1. For Samoa, the percentage of the population using an improved sanitation facility is 97%.
2. The percentage of the population that uses an improved water source is 97.3%, with 91.3% of the population having access to piped water.

The Sector now needs to refocus its efforts to improve standards of hygiene awareness and practice in order to reduce the current high incidence rates of diarrhoea and other water related diseases. Furthermore, while access to water has improved, the focus now needs to be on improving efficiencies of service, reducing water wastage and pumping costs, improving cost recovery and ensuring future levels of capital and recurrent expenditures are maintained.

The legislative and regulatory framework for the water sector is, at this stage in the reform process, largely in place. The Sector should now prioritise monitoring and enforcement of the regulations already in place.

Sector skills and capacity will remain an ongoing challenge for the Sector due to the shortage of skills nationally, especially in the technical fields, and the competition with other sectors. The availability of adequate Sector finance is crucial to its ability to achieve its goal and outcomes. The long term budget support provided by the EU, and the more recent project-based funding from JICA, have contributed significantly to the Sector progress and achievements to date. The continued support of the EU and JICA over the life of this Sector Plan will maintain the strong donor partnerships developed and will enable the Sector to deliver on its outcomes.

Given the performance of the Sector to date, the Sector is able to face the future with a greater sense of confidence and optimism.

Sector Goal and Outcomes

The *Water for Life Sector Plan 2016-2020* has been prepared to guide the developments of the sector over the next four years. The overarching development goal for the sector is "**Reliable, clean, affordable water and improved sanitation within the framework of Integrated Water Resources Management for a resilient Samoa, sustaining health and alleviating poverty***"* and underpins the achievement of the renewed national goal "Improved quality of life for All"

In order to realise the Sector Goal, the following outcomes are proposed for the next four years of implementation:

1. **Strengthened sector governance and orientation** to guide and sustain sector developments;
2. Enhanced **water resources resilience** from **Ridge to Reef*;***
3. Increased access and improved provision of reliable, clean and affordable **water supply**;
4. Improved surveillance of **drinking water quality** and water borne diseases
5. Increased access to improved **basic sanitation and hygiene practises**, improved **wastewater management** systems and accessibility to all available sanitation information
6. Strengthened **flood mitigation measures** to reduce incidence and magnitude of flooding in the CBD.

To achieve its aim of ***"Strengthened Sector Governance and Orientation"*** the **Governance** sub sector has identified six measures aimed at: improving the **monitoring** and reporting by having in place a more robust monitoring system to measure sector performance; improving the **financial skills** of implementing agencies and the financial budgeting mechanisms in place; strengthening sector **communication** and further building sector **coordination** skills, and improving the **disaster risk management** capacity and skills and preparedness of the implementing agencies.

The objective of the **Water Resources** (WR) sub sector remains "*to improve watershed management and reliability of WR data through integrated water resources management*". This is given the enormity and significance of this program which also includes the effective implementation and enforcement of the WR policy and legal framework, the strengthening of partnerships with stakeholders, and the building of community skills and confidence to enhance their important role as stewards of the catchment environment, in the face of increasing impacts from unsustainable development, climate change and natural disasters. These measures will ensure the achievement of the desired outcome of "***enhanced water resources resilience from Ridge to Reef*****'.**

The **Water Supply** sub sector has identified eight specific strategies to achieve the outcome of ***"increased access and improved provision of reliable, clean and affordable water supply".*** The Samoa Water Authority (SWA) as the prime agency for delivery of piped water supply services, will implement strategies which will address the need to: (1) increase water supply coverage to new areas; (2) improve water quality through new and rehabilitated chlorination facilities; (3) enhance financial sustainability; (4) improve community awareness and engagement; improve levels of service (5) and operational performance (6); reduce rates of non revenue water within the piped system (7); increase levels of customer satisfaction (8); build staff capacity and skills (9) and, improving information management and access to data (10).

The Strategies and actions for the independent water schemes revolve around continuation of the program to upgrade priority **rural water schemes**; improving water quality through measures such as implementation of Drinking Water Safety Plans (DWSPs), and trialling household level water

treatment technologies with a view to promoting their uptake by rural households. The Independent Water Schemes Association (IWSA) aims to improve levels of community engagement and management of schemes by local communities, as well as enhancing their financial sustainability. In addition, the Samoa Red Cross Society plays an important role in achieving this outcome through the provision of technical advice and implementation of rain water harvesting projects either through Red Cross funding or in conjunction with other stakeholders as a development partner such as EU through the sector. The newly formed organisation, Plumbers Association of Samoa have also been active in their role of providing guidance and establishing standards for national plumbers to ensure consistency in quality and services in plumbing.

To achieve its outcome of ***"surveillance of drinking water quality and water-borne disease improved"*** the **Drinking Water Quality** sub sector will implement measures to: improve surveillance and reporting of drinking water quality and water-borne diseases; strengthen the enforcement of the legal provisions for drinking water quality and Drinking Water Safety Plans; build capacity and improve coordination and information sharing between key stakeholders through enhanced partnership arrangements; build stakeholder confidence, and; improve the water testing laboratory facilities.

The **Sanitation** sub sector will implement a comprehensive program of measures in order to achieve its outcome of***" increased access to improved basic sanitation and hygiene practices, improved wastewater management systems***". These measures will: strengthen nationwide awareness programs on sanitation and wastewater management issues; increase compliance to sanitation and wastewater standards and regulations; improve the capacity of Implementing Agencies; continue to build public awareness of sanitation and wastewater issues, develop partnerships and strengthen public advocacy. In addition, the sub sector aims to improve wastewater management and disposal by trialling improved septic tank designs that achieve improved effluent quality, thereby reducing pollutant loads in critical catchments.

The intended outcome for the **Flood Mitigation** sub sector is ***"strengthened flood mitigation measures to reduce incidence and magnitude of flooding in the CBD"***. In order to achieve this the sub sector will implement a range of measures to mitigate the impacts of flooding in the CBD, strengthen the enabling environment, build the capacity of the key implementing agencies, improve enforcement and strengthening of awareness programs to encourage stakeholder participation in order to address negative behaviours toward care of public drains and river channels.

Implementation Arrangements

Since 2005, Samoa has undertaken a wide-ranging reform of the water sector and established a comprehensive institutional framework for the management and development of the country's water resources. The institutional framework has been developed and refined over many years and is now considered to be largely in place and 'fit for purpose' and able to deliver the sector outcomes required. The implementation arrangements allow for effective roles by different levels of government, the private sector and non-government organisations. The Sector actively encourages public participation and reaches out to communities, especially the more vulnerable. For example, in

partnership with the Samoa Red Cross Society, the Sector has been able to prioritise the needs of vulnerable households through initiatives such as the MDG Project. This enabled the Sector to increase access and coverage of improved water and sanitation services, so that Samoa has achieved its MDG targets.

The institutional framework in place is able to effectively coordinate and facilitate integration of planning, programming, implementation, monitoring and evaluation across the Sector. This is achieved through a hierarchy of committees:

- The **Ministerial Coordination Committee**(MCC) yet to be established comprises Ministers from the Ministry of Natural Resources and Environment(MNRE), Ministry of Health (MoH), Ministry of Finance (MoF), Ministry of Women, Community and Social Development(MWCSD), Ministry of Works, Transport and Infrastructure(MWTI) and respective Chief Executive Officers (CEOs). This committee will be the interface between Cabinet Development Committee, Cabinet and the Sector. Their main task is to review policy issues affecting the Sector and advocate Sector issues at the political arena.
- The **Joint Water and Sanitation Sector Steering Committee (JWSSSC)** operates at the CEO level, and comprises CEOs from key Implementing Agencies (IAs), Private Sector and NGOs with representatives from key development partners and reports to the MCC on national issues.
- Reporting to the JWSSC is the **Technical Steering Committee (TSC)**whose role is twofold; (i) to monitor technical and financial progress of sub-sector programs and (ii)to lead the development and / or review of Sector policies/strategies. The TSC is made up of IA coordinators or chairs of each of the sub-sector committees. The TSC is chaired by the Water Sector Coordination Unit (WSCU).
- Sub sector committees have been established for the following sub sectors which comprise the key technical areas of the Sector, each of which operates its own program of work, and sets its own goals, targets and outcomes:
    - Water Supply
    - Water Resources
    - Drinking Water Quality
    - Sanitation
    - Flood Mitigation

In addition, the Governance Sub Sector provides a support and coordination role to the above sub sectors. The Governance sub sector also provides the link to Disaster Management (and the Disaster Management Office, within the MNRE), which under this Sector Plan, will have a greater focus and enhanced capacity.

Resource Requirements

Since 2009, the Sector has been operating a Sector Wide Approach (SWAp) framework with EU budget support and this modality will continue throughout the duration of this Sector Plan. This

gives the Sector a high degree of flexibility in allocating both local and donor financial resources according to the national priorities and development goal and outcomes.

Summary of key program expenditure to achieve the following Sector outcomes is as follows:

- **Strengthened sector governance** to guide and sustain Sector developments will cost approximately SAT4million.
- **Improved watershed management** and reliability of water resources data through IWRM will cost the Sector approximately SAT 18million
- Increased access and improved provision of reliable, clean and affordable **water supply** will cost approximately SAT67 million.
- Improved surveillance of **drinking water quality** and water borne diseases will cost approximately SAT 1.7 million.
- Increased access to improved **basic sanitation and hygiene practises**, improved **wastewater management** systems will cost approximately SAT 12 million.
- Strengthened **flood mitigation measures** to reduce incidence and magnitude of flooding in the CBD will cost approximately SAT 20 million.

Way Forward

As the water sector in Samoa reaches its third generation of its Sector Plan, the Sector can look back with some satisfaction but with many remaining challenges. Samoa is one of the leading Pacific nations in terms of providing access for its citizens to water and sanitation services. A very high percentage of Samoans have access to a reliable piped water supply. Water quality continues to improve. The Sector largely has its legal and institutional framework in place together with effective coordination mechanisms.

The availability of adequate Sector finance has been crucial to its ability to achieve its goal and outcomes. The long term budget support provided by the EU, and the more recent project-based funding from JICA, have contributed significantly to the Sector progress and achievements to date.

In the future the Sector will have to reduce its dependency on donor assistance and strive to become more efficient and cost effective. Rates of non-revenue water (NRW) are still high and this remains a key challenge for SWA. Reduction in NRW is the key to reducing operation costs, and delaying or deferring the need for future works expansion. Likewise, the independent water schemes will need to improve financial management and revenue streams so that the schemes can be operated sustainably and expanded to reach new customers.

Skills shortage will continue to be a challenge for the Sector and will require it to find innovative ways to retain and reward staff, and develop skills relevant to its needs. In order to make best use of all the available skills, the Sector will need to strengthen its relations with private sector, with non-government agencies, and with its beneficiary communities. This will require effective coordination mechanisms and a coherent monitoring, evaluation and reporting framework to ensure transparency and accountability in the Sector and to minimise duplication of efforts and wastage of resources.

Chapter 1: Introduction

1.1 Sector Background

The European Union (EU) has been a major supporter of the water sector in Samoa for over 10 years, initially through the EU-funded Water Sector Support Programme (WaSSP) from 2005 – 2010, which prepared the Sector for transition to a Government led 'sector-wide approach' modality with EU budget support. A significant achievement of the WaSSP was the development of the first "Water for Life" Sector Plan which covered the period 2008 – 2012. This was followed by the second Water for Life Sector Plan covering the 2012 – 2016 planning period. The development of the Sector Plans has fully engaged the key sector agencies and stakeholders in an active planning process that has entailed a review of the progress achieved and the performance measures and targets adopted, and the detailed costings of all strategies, programs and activities. Over the two four-year planning periods (covered by the Sector Plans to date) significant progress has been achieved in the development and realization of the key sector objectives. The strategies and planning targets set in the Sector Plans, and the progress achieved, are reviewed during the Sector Annual Performance Workshop with the results published. The Water for Life (WfL) Sector Plan is thus a living document as well as a monitoring tool which is constantly evolving and adjusting to sector needs and priorities.

The second WfL Sector Plan (2012 – 2016) was more comprehensive in scope than its predecessor and reflected the growing importance of hygiene in achieving health and sanitation outcomes, and the importance of an integrated water resources management approach to water resources. This, the third revision of the WfL Sector Plan, will build on the successes of previous versions of the Sector Plan and will incorporate a greater awareness of the impact of climate change on the sector.

The Water and Sanitation (WSS) Sector (hereafter referred to as the Sector) is one of the fourteen key sectors in Samoa under the Government planning initiative. It is also one of the priority sectors as it directly impacts on the quality of life of the people and overall productivity of the population. Water resources management, supply and sanitation are among the key issues emphasized under the Strategy for the Development of Samoa 2012-2016[1] (SDS), which is the key government framework for ensuring an enabling environment for rapid economic development and social transformation.

Despite Samoa being well endowed with significant freshwater resources, the challenges of wasteful water use, uncontrolled catchments, residential and agricultural development, environmental degradation, pollution and weather extremes, including droughts and flooding, have in recent years combined to accelerate the depletion and degradation of the available water resources. These challenges have been compounded by climate change impacts.

The scope of sector strategies and actions contained in the Sector Plan comprises the conservation, development, use and monitoring and evaluation of all fresh water resources and the receiving coastal waters in Samoa both in terms of water quality and water quantity. Coverage of sanitation[2]including

1 Ministry of Finance Economic Policy and Planning Division, July 2012.

2 Sanitation as it applies to this sector includes on-site as well as off-site sanitation systems including the collection and treatment of septage and piped wastewater/sewerage collection, treatment and disposal systems. Solid waste management including hazardous waste management is covered by the Environment Sector.

emphasis on good hygiene practice, wastewater and drainage issues has been mainstreamed into the Sector domain since 2008.

This document presents a logical and pragmatic framework for action in the context of national and Sector planning and is the result of an extensive Sector assessment involving public, private and community consultations and is therefore shaped to respond to crosscutting issues like public health, poverty, gender and culture and climate variability and those unique to the Sector.

1.2 Purpose of this Plan

The Government of Samoa (GoS) has prioritised investment in water in order to pursue improvements in public health, promote economic growth and ensure the effective management and supply of water resources. Critical developments over the last decade culminated in the adoption of a Sector Wide Approach (SWAp) in early 2006 by the Sector. The SWAp framework for achieving sector development goals and outcomes is now well embedded in the Sector architecture and has proved to be an effective mechanism for resource mobilisation and implementation of the Sector Plan. The SWAp framework also promotes the participation of all stakeholders in the planning and implementation of Sector activities. This openness and the benefits from such an approach have resulted in increased confidence from major development partners including the EU which has agreed to finance the Sector program through the regular government budget (Sector budget support programme) rather than as project specific funding.

The main objective of this third revision of the Sector Plan is to focus on the implementation of key reforms, policies and outcomes over the 2016-2020 timeframe.

Chapter 2: Country Context

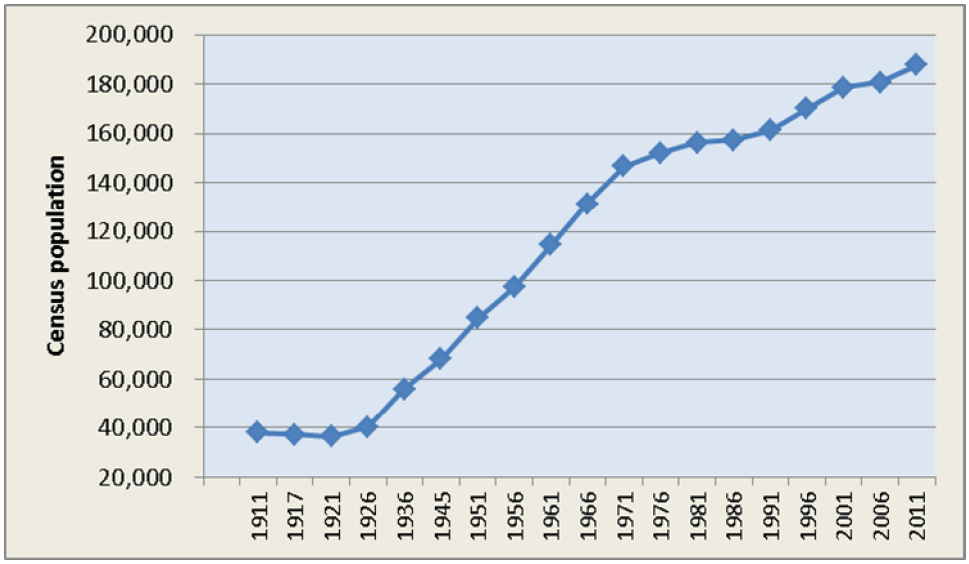
2.1 Country Background

Samoa is a small island country in the southwest Pacific, comprising of two main islands (accounting for more than 99% of the total land area) and seven smaller islands. Its total land area is 2,840 km^2 and its Exclusive Economic Zone is 120,000 km^2.

Over the 100 years between the 1911 and 2011 censuses, the population of Samoa has increased from 38,000 to 188,000—a five-fold increase (Figure 1). Over this 100-year period, population growth averaged 1.6 percent per year. From 1911 there was a period of low growth followed by a period of rapid growth followed in turn by a period of slow growth. Samoa's population has commenced growing again after 1986 and this trend has continued up until the most recent census in 2011.

Samoa's population as of the 2011 census is 187,820 with an average growth rate, for the period 2006-11, of 0.8 percent. The rate of natural increase in the population is determined by rising fertility and declining mortality offset by increased rates of emigration[3].

Figure 1: Population change 1911-2011 (Census counts)



Source: Draft Population Action Plan, MoF.

2.1.1 Topography & Geology

Samoa's topography is rugged and mountainous with the highest peak being Mt. Silisili on Savaii Island reaching 1,848 m in height. The land mass of each island rises gently from the sea (with the exception of eastern Upolu which rises very steeply). In most areas there is a flat to gently undulating coastal plain (1–2 degrees) which passes into gently rolling slopes (2–5 degrees). These in turn, merge into steeper foothills (5–15 degrees) which continue, sometimes steeply (15–25 degrees), until the upland plateau level is reached at about 600 m in Upolu and eastern Savaii, and at 1 200 m in central Savaii.

3 People, place and sustainability: Samoa's population action plan 2016 – 2021, Department of Economic Planning, Ministry of Finance

The slopes are often dissected by almost-vertical sided valleys. In general, the upland plateaux are rolling and surmounted by extinct volcanic cones[4].

The geology is composed mainly of basic volcanic rocks with much younger rocks found in Savaii and this could be attributed to the last eruptions in 1760, 1902 and 1911. The older volcanics are extensively weathered to form clayey soils, resulting in rapid surface water run-off, whilst the younger volcanics have poorly developed or no soils and allow rapid infiltration. The distribution of water resources is therefore very much determined by the country's geology.

2.1.2 Climate

The climate is generally marked by a distinct wet season (November to April) and dry season (May to October). The annual rainfall is about 3,000 mm (varying from 2,500 mm in the north-west parts of the main islands to over 6,000 mm in the highlands of Savaii) with about 75 per cent of the precipitation occurring during November-January.

Samoa's rainfall is greatly influenced by the position and strength of the South Pacific Convergence Zone. This band of heavy rainfall is caused by air rising over warm water where winds converge, resulting in thunderstorm activity. It extends across the South Pacific Ocean from the Solomon Islands to the Cook Islands and lies between Samoa and Fiji during the wet season. Samoa's mountains also have a significant effect on rainfall distribution. Wetter areas are located in the south-east and relatively sheltered, drier areas in the north-west[5].

Temperatures in Samoa are generally consistent throughout the year, with only very small seasonal differences. Average temperatures are coolest in July, when the cool, dry south-east trade winds are strongest. The warmest month is March.

Samoa's climate varies considerably from year to year due to the El Niño-Southern Oscillation. This is a natural climate pattern that occurs across the tropical Pacific Ocean and affects weather around the world. There are two extreme phases of the El Niño-Southern Oscillation: El Niño and La Niña. There is also a neutral phase. In Samoa, El Niño events tend to bring wet seasons that are drier than normal, while La Niña events usually bring wetter and cooler than normal conditions.

Droughts and flooding associated with the El Niño-Southern Oscillation have impacted the socio-economic livelihoods of the Samoan people on many occasions in the past. Flooding associated with tropical cyclones and strong La Niña events has caused widespread damage in Samoa in the past, particularly in Apia. In early 2008 and 2011, for example, transportation infrastructure and water supplies were severely damaged. Drought impacts are most notable in the north-west regions of the main islands and at times are associated with forest fires. In Asau, there were major forest fires during the dry seasons of1982-83, 1997-98, 2001-02and 2002-03.

Tropical cyclones affect Samoa between November and April. In the 41-year period between1969 and 2010, 52 tropical cyclones passed within 400 km of Apia, an average of one cyclone per season. The number of cyclones varies greatly from year to year, with none in some seasons but up to five in others. Over the period 1969–2010, cyclones occurred more frequently in El Niño years[6].

4 Country Pasture/Forage Resource Profiles, SAMOA by Stephen Lee. FAO 2009.

5 Pacific Climate Change Science Program - Current and future climate of Samoa, Samoa Meteorology Division, Ministry of Natural Resources and Environment, Australian Bureau of Meteorology & Commonwealth Scientific and Industrial Research Organisation (CSIRO). November 2011.

6 Ibid.

2.1.3 Natural Disasters

The geographical location and physical environment of Samoa makes the country prone to a number of natural and human-induced hazards. Some of these hazards are seasonal, such as tropical cyclones, floods and droughts. Others are an ever present threat, such as earthquakes, volcanic eruption, tsunamis, epidemics, industrial hazards, exotic plant or animal diseases. Samoa is also experiencing an increase in the frequency and severity of disasters. The potential losses due to the disasters are set to increase as the impact of climate change continues to unfold. These have had adverse effects on communities, the economy, infrastructure and the environment, as well as the development priorities of the country[7].

In September 2009, a tsunami devastated the whole country when it hit south-eastern Upolu and claimed 147 lives. Heavy rainfall events have also caused major flooding particularly in the Apia urban area, a low-lying flood plain prone to flooding. Droughts cause major stresses on availability of water resources for water supply purposes. In 1988/89 an El Nino drought was recorded as a highly severe event in that major water supply rationings were carried out as well as major bush fire events in the island of Savaii. Recently, prolonged drought conditions were experienced from May to October in 2011 and most of the country's surface water intakes dried up disrupting water supplies in many areas. The impact of the drought also affected neighbouring islands like Tokelau and Tuvalu who faced major water shortage crises and required relief assistance to import water for drinking and meeting other basic needs.

The latest tropical cyclones to have hit Samoa causing widespread devastation (population, health, environment, economy etc) were Cyclone Ofa in 1990 and Cyclone Val in December 1991, Cyclone Heta in January 2004 and the Cyclone Evan in December 2012. The damage estimate from Cyclone Evan was put at US$103.3million, with an additional estimated US$100.6million suffered in production losses to the economy. Thus the total effect of the disaster was estimated to be US$203.9million, equivalent to about 28 percent of the total value of goods and services produced in the country in 2011[8].

The damage caused by Cyclone Evan included the loss of 5 lives with some 4,800 people temporarily displaced and 2,088 houses destroyed or damaged. Cyclone Evan destroyed power plants cutting power, disrupted communication services, caused inland flooding to populated urban areas, uprooted trees many of which contributed to log dams adding to already swollen rivers, destroyed buildings and roads, and extensively damaged crops. Water facilities and distribution systems were badly damaged causing disruptions nationwide.

Research into the effects of Cyclone Evan on the health of the population of Samoa found evidence of a marked increase in both communicable and non-communicable diseases during and post Cyclone Evan such as upper respiratory infections, influenza like illness, diarrhoea, diabetes, injuries, and skin diseases such as celluliteis, scabies, fungal infections also hypertension showed a marked increase after Cyclone Evan[9].

Data from the MoH (Figure 2) illustrate how recorded weekly diarrhoea cases fluctuate throughout the year with the overall number of cases remaining high, above threshold level for Samoa of 50. A noticeablepeak corresponds to the aftermath of Cyclone Evans.

7 Ref Draft National Disaster Management Plan 2016 – 2019.MNRE January 2016.

8 SAMOA Post-Disaster Needs Assessment - Cyclone Evan 2012, Government of Samoa, March 2013

9 Project Report on 'Impact of Climate Change on Health in Samoa', Team Combat. September, 2013.

Figure 3[10]shows the trends of communicable diseases by month of patients being referred to TTM Hospital pre and post disaster of Cyclone Evan. Trends show that in the month after Cyclone Evan there was a great increase in the number of patients with diarrhoea and gastroenteritis and influenza. Diarrhoea reached a peak in February at 698 cases and then declined in March to 552 cases.

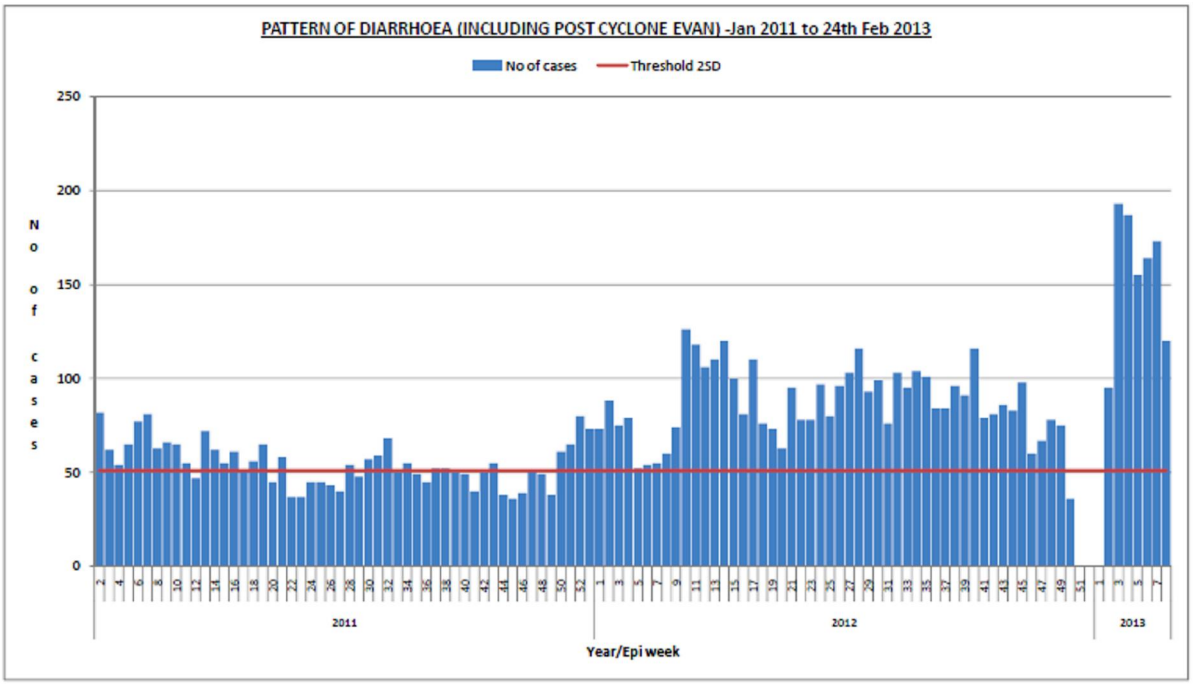
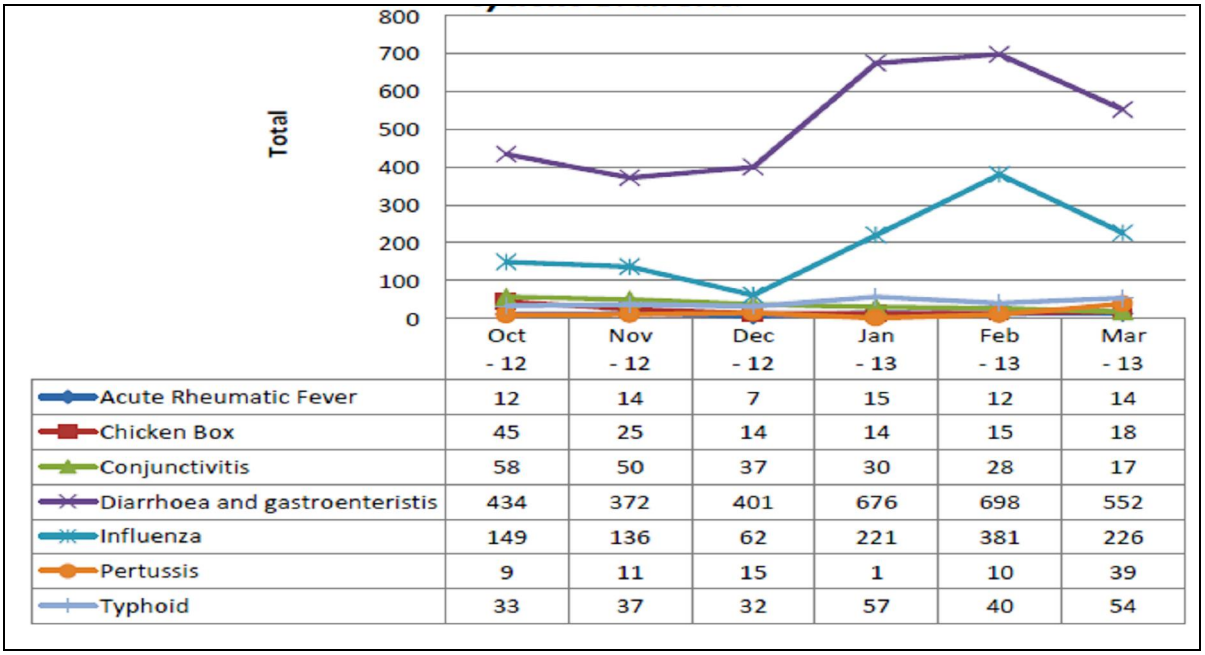


Figure 2: Diarrhoea Cases Pre and Post Cyclone Evan (December 2012)



	Oct - 12	Nov - 12	Dec - 12	Jan - 13	Feb - 13	Mar - 13
Acute Rheumatic Fever	12	14	7	15	12	14
Chicken Box	45	25	14	14	15	18
Conjunctivitis	58	50	37	30	28	17
Diarrhoea and gastroenteristis	434	372	401	676	698	552
Influenza	149	136	62	221	381	226
Pertussis	9	11	15	1	10	39
Typhoid	33	37	32	57	40	54

Figure 3: Communicable Disease Cases Reported Pre and Post Cyclone Evan (December 2012)

10 ibid

2.1.4 Land Ownership

Access to environmental resources is intricately linked to the traditional land tenure system which controls over 80% of Samoa's land resources. The rules governing the allocation of access, use and ownership rights to land and resources under communal ownership are sometimes complicated, and is a subject of several published research and scholarly investigations. In some cases, the land tenure system is perceived as a stumbling block to development, because of difficulties of accessing land for development and investment[11].

Table 1: Land Distribution by Tenure in Samoa

	1989	1999	2009
Customary land	94%	90%	86%
Leased customary land	1%	1%	1%
Leased government land	2%	2%	3%
Own freehold land	3%	6%	9%
Leased freehold	0%	0%	1%
Others/not stated	0%	1%	1%

Source: Samoa Bureau of Statistics Census of Agriculture

Communal ownership of resources within villages can encourage self-interested individuals to maximize their own benefits leading to resource depletion. An example is the customary rule where the right of use (and de-facto ownership) of village communal land is acquired and claimed by whoever of the village clears the forest on it. This encourages many to clear forested lands merely to stake a claim with little or no long term commitment to its development.

The environmental consequences of these traditional arrangements are severe and result in habitat loss, habitat fragmentation, and loss of vegetation cover in sensitive environments including catchments and erosion-prone areas. Land clearance due to logging and agricultural developments and a growing trend in land subdivisions have been identified as the main culprits in watershed degradation and declining water quality.

2.2 Public Health Improvements

Water-related diseases can be water borne, caused by water privation, or even just associated with water. Often these categories can overlap and can associate with major Public Health disease outbreaks. Diarrheal diseases and typhoid fever are two main water-related diseases in Samoa. In recent years, there has also been a substantial increase in water-associated diseases such as arbo-viral infections with outbreaks of Chikungunya in 2014, Dengue Fever and Zika virus diseases in 2015-2016. It is essential that Public Health response and interventions be multi-faceted in harnessing the available assistance included under the Water for Life Sector Plan, as well as other health programs and resources in order to effectively address the public health needs of the Samoan population.

2.2.1 Diarrhoea

The trend in diarrheal diseases over the four years (2012-2015) has shown some improvements in that threshold levels have not often been breached, as illustrated in Figure 4. An obvious breach in 2012-2013 coincided with the aftermath of Cyclone Evans, where population displacement and water quality and infrastructure in affected areas would have been a factor. In 2014 during the months of

11 Samoa's State of the Environment (SOE) Report 2013, MNRE, Government of Samoa.

April- June there was another breach, which was attributed in the main to cases in the age group 0-4 year olds. Poor hygiene practices with bottle-fed babies and poor weaning and nutrition substitutes were the reasons for the high incidence rate in this age group. Malnutrition was a noticeable problem associated with diarrhoea during this year. One of the many causal factors related to incidences of diarrhoea is the unregulated use of traditional herbal medicines often given to this age group.

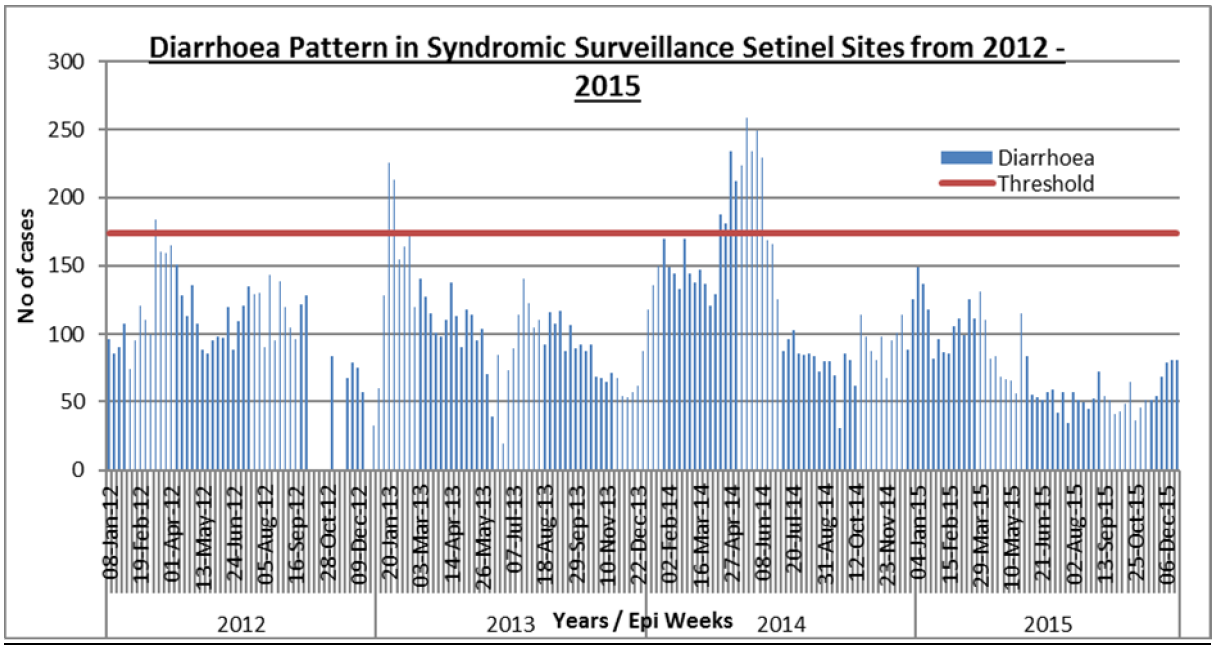


Figure 4: Diarrhoea Pattern

2.2.2 Typhoid

Typhoid fever is endemic in Samoa. The trend of 'Lab positive' Typhoid cases in the seven year period 2009 to 2015 is provided in Figure 5. Generally, typhoid has been a long standing problem with multiple outbreaks recorded in the early 1990s into 2000s. In 2012 there was a major typhoid outbreak with cases mainly from Tafaigata prison. The trend of typhoid cases continued to decrease throughout the following years. Positive Lab cases continued to be less than 10 cases each month (refer Figure 6), with a slight rise in numbers during August-September of 2015 period. There were no further rises in the subsequent quarter period, although the overall number of typhoid Lab positive tests was greater in the year 2015 (70 lab positive cases) than in 2014 (52 lab positive cases).

Currently the burden of typhoid disease is estimated at $270/10^5$ population. This is a high endemic prevalence burden which was estimated in 2012. Since then, improvement in patient management protocol for typhoid treatment to include Ciprofloxacin for treatment of diagnosed cases was believed to have decreased the typhoid trend. However, many other factors contributing to this status continue to require careful assessment and sustained effort. The Ministry of Health continues to work with the World Health Organisation (WHO) and world renowned specialists in addressing typhoid in Samoa, looking to address the spread of the disease, and to ensure safe water supply and sanitation for the population. The Ministry of Health, the National Communicable Diseases Control Committee and its Health Sector and partners is continuing efforts to address the incidence of typhoid in the community, including the possibility of introducing a typhoid vaccine for the control of typhoid in the country.

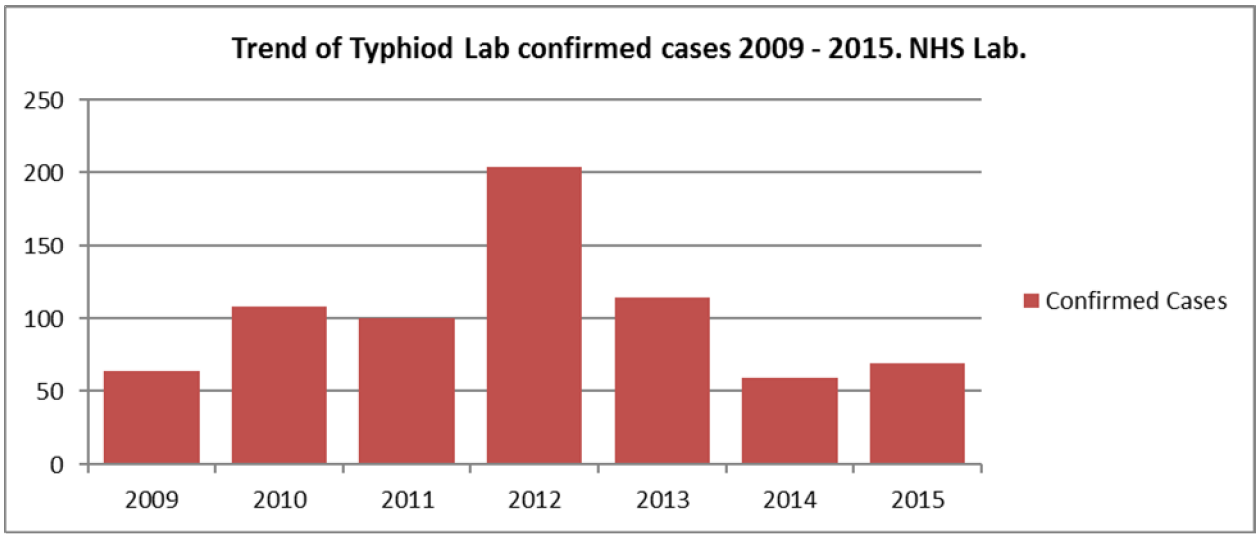


Figure 5:Typhoid Cases

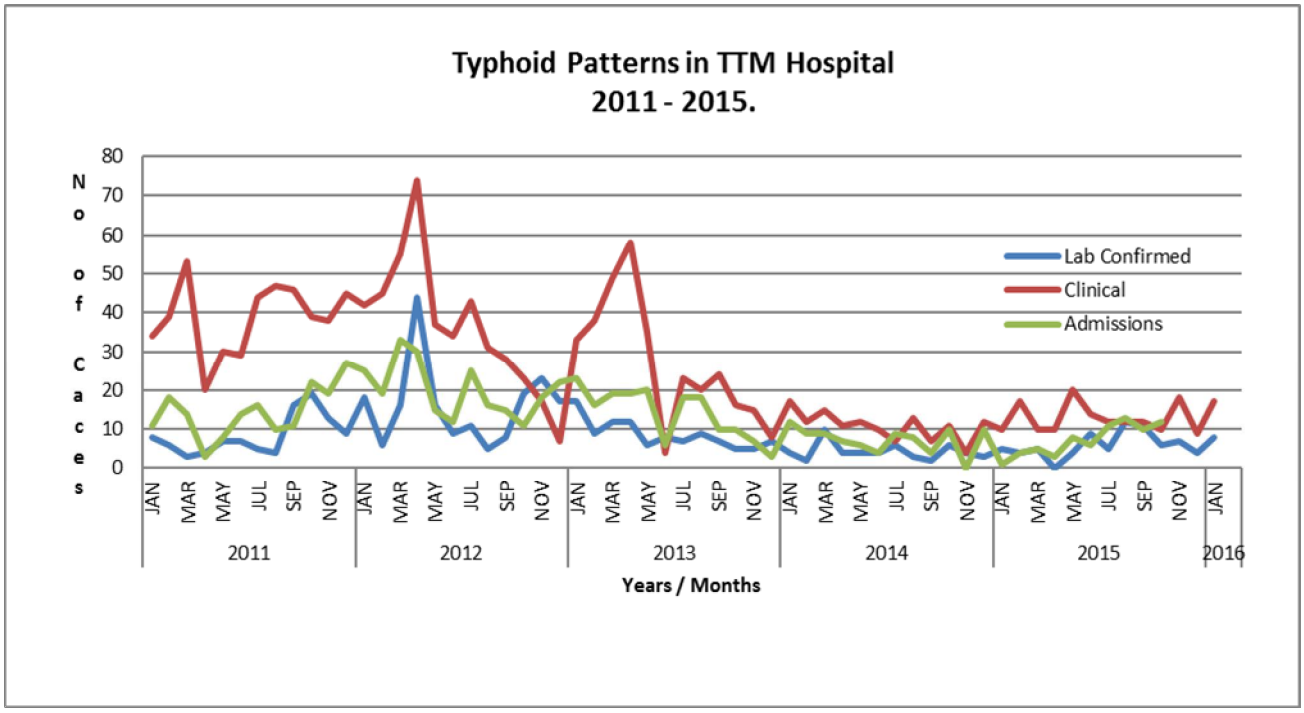


Figure 6: Typhoid Pattern

2.3 Culture and Gender

The importance of involving both women and men in the management of water and sanitation has long been recognized at the global level and has been a key policy position and an important cross cutting theme in achieving equity and efficiency in water service provision. Starting in 1977 with the United Nations Water Conference at Mardel Plata, throughout the tenure of the International Drinking Water and Sanitation Decade (1981-90) and continued through the Millennium Development Goals (MDGs)[12]. The International Conference on Water and the Environment in Dublin (January 1992) further recognized the central role of women in the provision, management and safeguarding of water.

A study by the International Water and Sanitation Centre (IRC) of community water and sanitation projects in 88 communities in 15 countries[13] found that projects designed and run with the full participation of women are more sustainable and effective than those that do not. This supports an earlier World Bank study that found that women's participation was strongly associated with water and sanitation project effectiveness[14].

Samoa is a patriarchal society and this is most evident in rural society where village governance is undertaken by the "fono" or Council of Matai, an all-male structure that monitors and ensures the implementation of village rules. Each village also has a women's committee, which assumes responsibility for health, and social and community development. Religion (Christianity) also plays an important role in Samoan society, with religious leaders (who are usually male) commanding great influence and respect in the village.

In Samoa as in most societies, women have primary responsibility for management of household water supply, sanitation and health. Therefore, women have a keen interest and critical role in issues of water access and availability, and water quality. In Samoa traditionally men are more concerned with water for irrigation or for livestock purposes, but exert a greater decision-making role at the household level. Water sector strategies in Samoa have long recognized the different and complementary roles of both women and men and the need to engage with both to ensure the best outcomes for the sector.

In terms of Sector governance Samoan women are well represented within the key sector agencies, in both technical and management positions, and have for some time now occupied key decision making roles. The current Managing Director[15] of the Samoa Water Authority (SWA), the largest water provider in the country with a staff of 254[16], is female. Women make up 22% of total SWA staff. About 45% of the SWA Management team are women, 55% of engineers are female with 52% of senior technical positions taken up by women.

The head of the Water Sector Coordination Unit (WSCU), the key agency that provides sector leadership and coordination, has been filled by a woman since the creation of this unit.

12 Gender equality and women's empowerment (Goal 3), and target 10 on access to water and sanitation.

13 Van Wijk-Sijbesma, Christine, 1998. Gender in Water Resources Management, Water Supply and Sanitation: Roles and Realities Revisited. International Research Centre for Water and Sanitation. Delft, the Netherlands.

14 UN Water - Gender, Water and Sanitation: A Policy Brief.

15Since 2014

16As of September 2016

2.4 Water Resources

Samoa has abundant water resources compared to many other Pacific Islands. The average rainfall is over 3,000mm/year (varying from 2,500 mm in the north-west parts of the main islands to over 6,000 mm in the highlands of Savaii) with about 75 per cent of the precipitation occurring during November-January.

Conventional water resources include surface water and groundwater. There are more than forty river systems in Samoa originating in the uplands and draining to the sea. The major perennial rivers on Upolu are the Fulusou, Vaisigano, Laulii, Falefa, Namo, Luatuanuu, Fagalii, Mulivai, Piu, Salani, Tafitoala, Nuusuatia, Lotofagā (Safata) and Faleaseela Rivers. The only major perennial watercourses in Savaii are Sili River, Palauli River (or Faleatā), and the upper reaches of Vaipouli. Flooding normally occurs during the wet season months of November to April following prolonged or intensive rainfall events. After the wet season ephemeral rivers and streams begin to dry up and perennial river systems experience low flows.

Samoa's watershed areas are typically characterized as small in size with steep slope gradients resulting in rapid responses to rainfall events with significant sediment loads. Low flows in dry periods have been known to cause problems for the urban Apia water supply system. Surface water and groundwater are used for water supply by SWA, the national service provider, and by Independent Water Schemes and the bottled water companies. Surface water provides approximately 65% of the water supply and groundwater 35%.

2.5 Climate Change

Climate change, defined as a change in climate due to global warming caused by excessive fuel burning, atmospheric pollution and deforestation, particularly over the last fifty years, now presents a critical problem on a global scale, with far reaching impacts into every area of human life and development, health included. According to the WHO climate change causes a rise in temperatures and sea levels and increases the frequency for more tropical cyclones, heavy precipitations or rainfall, extended drought spells, landslides, coral bleaching and high turbidity of drinking water.

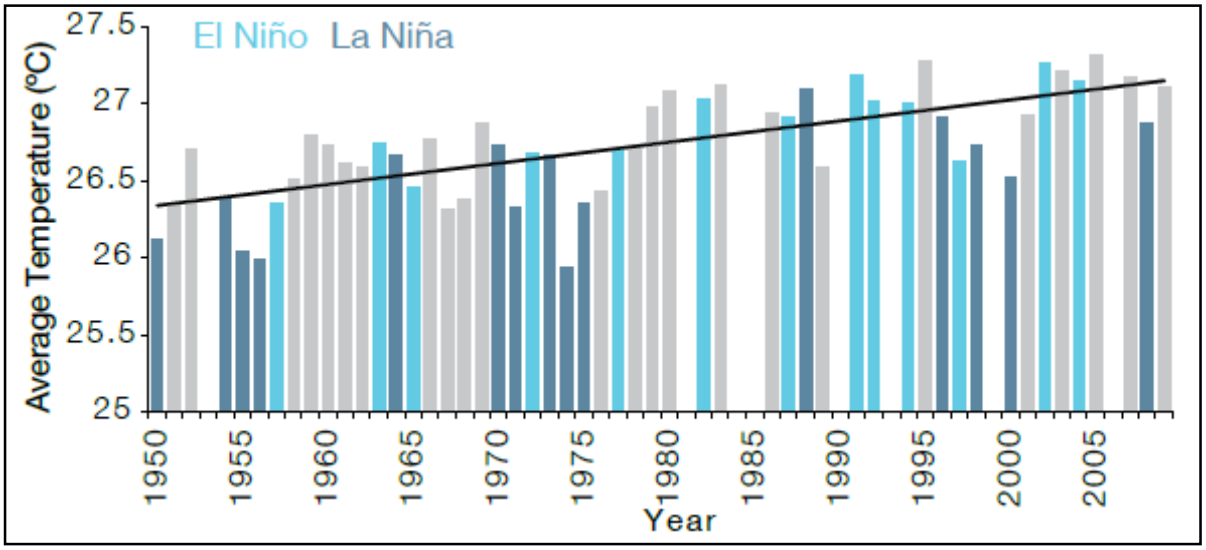
Annual maximum and minimum temperatures have increased in Samoa since 1950 (Figure 7). In Apia, maximum temperatures have increased at a rate of 0.22°C per decade. These temperature increases are consistent with the global pattern of warming[17]. The results of climate modelling indicate a continuation of warming in the future. Rainfall data for Apia since 1950 show no clear trends in annualor seasonal rainfall but, rather, over this period there has been substantial variation in rainfall from year to year. There is as yet no consensus around rainfall projections for Samoa however model projections generally suggest a decrease in dry season rainfall and an increase in wet season rainfall over the course of the 21st century. Model projections further show extreme rainfall days are likely to occur more often[18].

17 Pacific Climate Change Science Program - Current and future climate of Samoa, Samoa Meteorology Division, Ministry of Natural Resources and Environment, Australian Bureau of Meteorology & Commonwealth Scientific and Industrial Research Organisation (CSIRO). November 2011.

18 ibid

Satellite data indicate the sea level near Samoa has risen by about 4 mm per year since 1993. This is slightly larger than the global average of 2.8–3.6 mm per year and may be partly due to natural oscillations decade to decade caused by El Nino.

Figure 7:Annual rainfall for Apia. Light blue bars indicate El Niño years, dark blue bars indicate La Niña years and the grey bars indicate neutral years.



Source: Pacific Climate Change Science Program - Current and future climate of Samoa, Samoa Meteorology Division et al, November 2011

Evidence of the debilitating effect of climate change on Pacific Island nations is becoming more convincing and widely accepted. Changes in rainfall, rising temperatures and sea level rise, as well as greater climate variability in terms of more frequent and intense cyclones and storm surges, as well as prolonged drought periods are predicted to have devastating impacts on not only water quality and quantity, but water supply and treatment infrastructure as well[19].

Samoa's vulnerability to extreme events is evidenced by the following sequence: Cyclone Ofain1990, Cyclone Val in the early 1991, Cyclone Heta of 2004, Tsunami of 2009 and Cyclone Evan 2012. Cyclone Evan in December 2012 caused significant damage with losses amounting to SAT$235.7million (US$103.3million) equivalent to about 28 percent of the total value of goods and services produced in Samoa for the year 2011[20].

While the impact of extreme events such as Cyclone Evan is dramatic and severe, much of the damage caused is short term and recoverable. The more gradual and irreversible influence of long term climate change on water resources are perhaps of greater concern.

19 Vulnerability and Adaptation Assessment Report for the Water Sector, MNRE & SWA. Undated.

20 Post Disaster Needs Assessment, 2013.

Samoa's State of the Environment (SOE) Report 2013

"Impacts of human induced climate change and climate variability predicted in the 2006 SOE report are now a reality for Samoa. Observed trends include: increased maximum air temperatures, increased frequency in extreme daily rainfall events, sea level rise of 5.2mm a year. Similarly are the predicted increase in the frequency and intensity of cyclones.

The emergence of climate change induced extreme events such as cyclones, floods, droughts etc as a major threat to Samoa's economic development has pushed climate change and climate variability into the forefront of Samoa's economic development agenda. Environmental sustainability and disaster reduction constitute one of four priority areas in Samoa's 2012-2016 SDS".

According to the Samoa Meteorology Division annual maximum and minimum temperatures have increased in Samoa since 1950. There is also evidence of changes to the hydrological cycle with warmer temperatures causing increased evaporation and the drying out of some catchment areas. The Meteorology Division has projected a decrease in dry season rainfall and an increase in wet season rainfall over the course of the 21st century[21]. These changes will affect catchment areas as well as impact on the hydrological regime of streams, with resulting changes in the magnitude, duration and frequency of stream flows. Such hydrological changes are usually accompanied by water quality degradation due to increased sediment and pollutant loads in the wet season caused by the higher rainfall and runoff.

Reduced dry season rainfall will result in prolonged dry conditions, water shortages and the need for water rationing, whilst heavy rains will exacerbate problems of flooding and sedimentation as storage dams and reservoirs become filled with sediments as a result of sediment mobilization during flooding, thus impacting on water supply and generation of electricity (in the case of the Fuluasou hydropower reservoir). Flooding also has an adverse impact on water quality, with higher turbidity and sediment loads leading to short water treatment cycles or even treatment plant overload, and surcharging of sewerage systems and septic tanks leading to increased dangerously high levels of faecal contamination in water courses and the ocean foreshore.

Investigations into the impact of sea level rise on groundwater have been initiated but the results of this over a sufficiently long timeframe are still awaited. However, some production boreholes have been abandoned as a result of saltwater intrusion due to over extraction. Sea level rise and increased rainfall will affect the construction of proper septic tanks for sanitation, especially in low lying areas. As sea levels rise, contamination of marine waters will increase, especially if sealed septic tanks are not properly constructed. Improved maintenance and upgrading of the drainage system will be required in order to accommodate increased runoff from rainfall and flood events. Flood plain management will also need to take into account the potential resettlement of communities further inland.

Climate change also has a significant impact on health since it affects the essential requirements for health – namely clean air, safe drinking water, food security and shelter. Furthermore, it increases the risk of illness and death from diseases which are already of much concern, such as diarrhoea,

21Elisaia-Vaai, A. et al. 2014 "The impacts of climate change and development on water catchment areas on water resources". The Samoan Water and Sanitation Journal, Vol 1, No 1, December 2014.

malnutrition, dengue, cardiovascular and respiratory conditions as well as mental disorders[22]. Groups identified as more vulnerable to climate change events include those of low socio economic status, children, the elderly and people with disabilities. The health effects of climate change are expected to be more severe for elderly people and those with pre-existing medical conditions.

Water managers will need to factor in the impact of climate change in their planning and strategiesto increase contingency storage to cater for extended dry seasons, to improve spillways and drainage systems and stream courses to cater for increased wet season flows and reduce flooding. With increased evaporation managers will need to optimize water use from surface and groundwater sources, reduce water wastage, while at the same time developing a sound business model for water supply based on realistic cost recovery tariffs. With an increased severity of disasters and extreme weather events health professionals will need to increase their level of preparedness to cope with the associated debilitating health impacts.

22 Impact of Climate Change on Health in Samoa, Team Combat. September, 2013.

Chapter 3: Sector Performance Assessment

3.1 Sector Performance Overview

3.1.1 Water and Sanitation Millennium Development Goals

The Samoan water sector has performed well in the attainment of MDG targets, and is one of the top performing Pacific nations when measured against key performance indicators for the sector.

The most recently published regional comparison undertaken by the Joint Monitoring Program[23](JMP) indicated that 98% of Samoans had access to improved sanitation (Figure 8) with 98% of the population also having access to an improved water source (Figure 9).

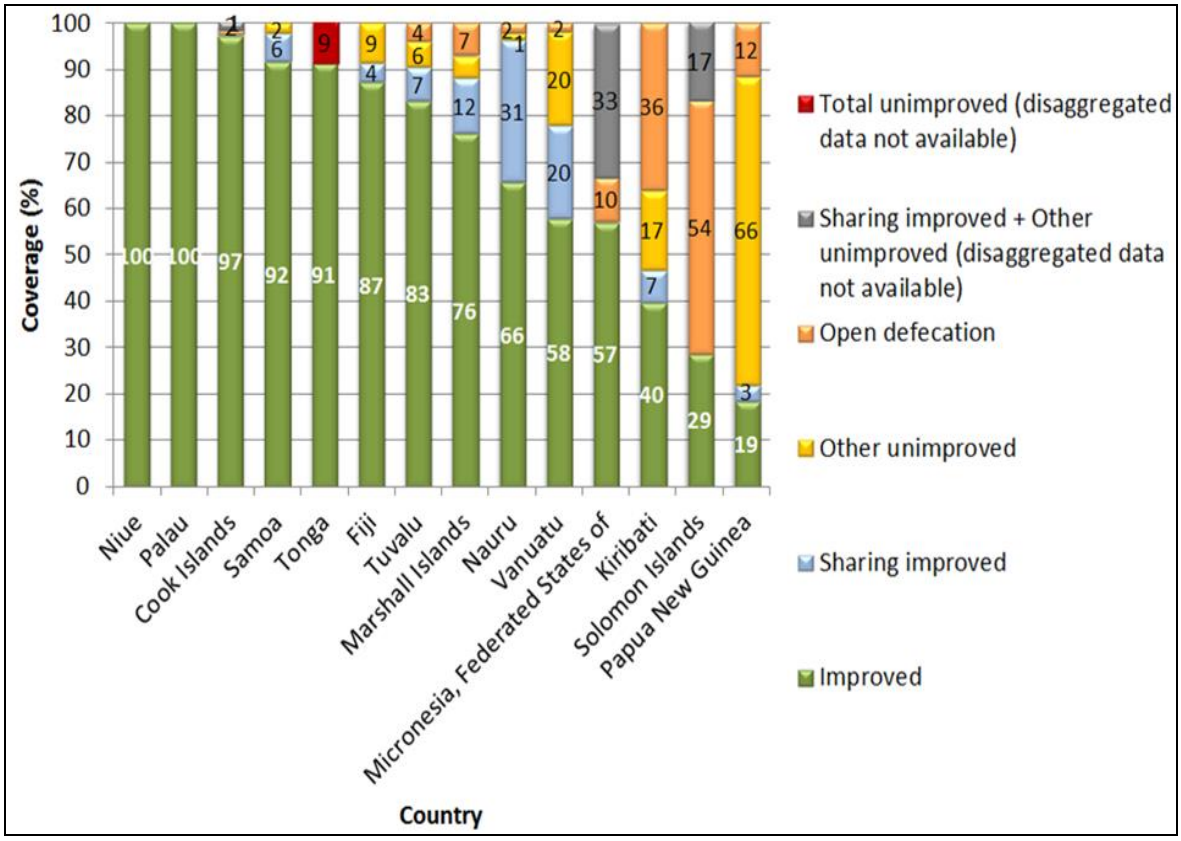


Figure 8:Access to improved sanitation Pacific Island Countries (JMP, 2014)

23 International monitoring program carried out by World Health Organization (WHO)and UNICEF.

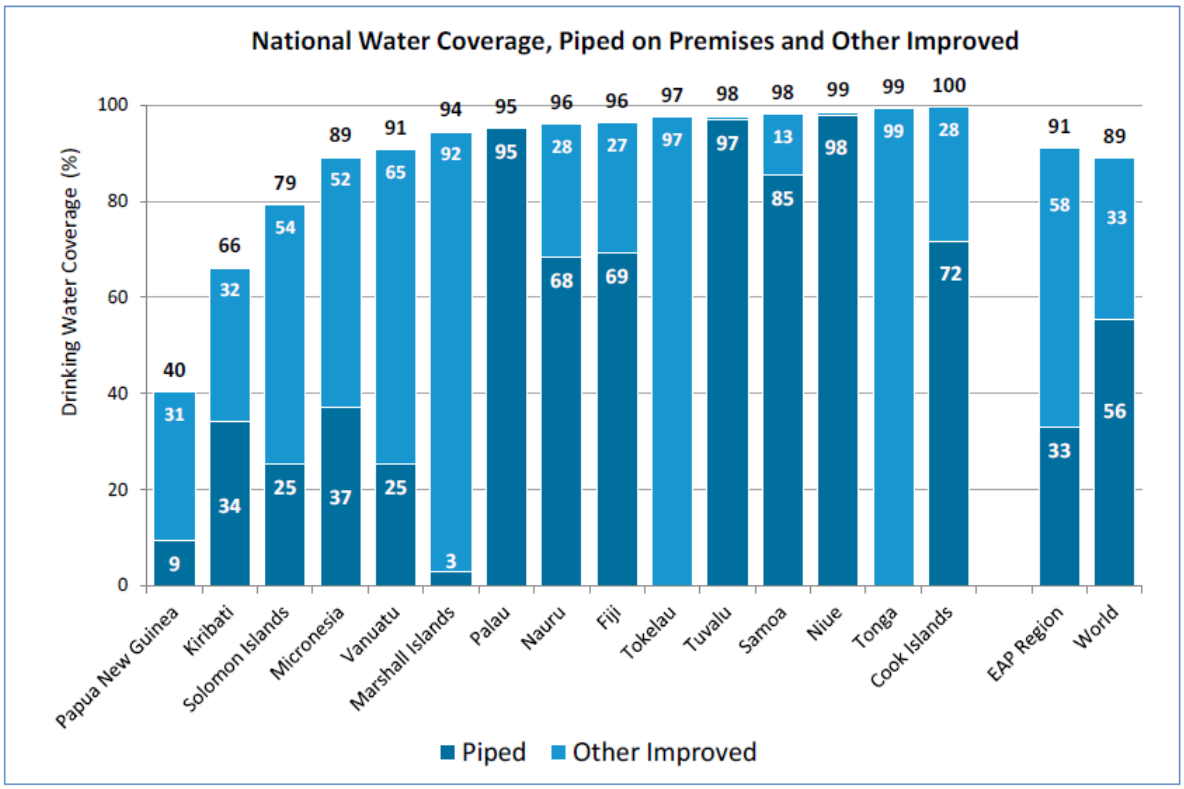


Figure 9: Access to improved water, Pacific countries (JMP, 2011).

The recently conducted national-scale Water, Sanitation and Hygiene (WASH) Baseline Survey[24], found that, for the 2 key MDG indicators:

1. for Samoa, the percentage of the population using an improved sanitation facility is 97%.
2. the percentage of the population that uses an improved water source is 97.3%, with 91.3% of the population having access to a piped water

The Baseline WASH Survey can be considered more comprehensive and up to date in comparison to the JMP data, but overall both data sources are in general agreement.

In global terms, Samoan's access to (i) improved sanitation facilities and (ii) an improved water source, rates highly (Figure 10, Figure 11).

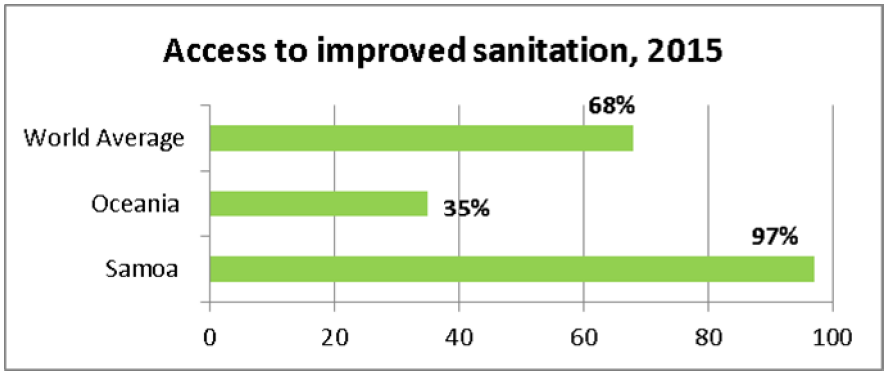


Figure 10: Access to improved sanitation - global comparison (2015 data[25])

24 National Water and Sanitation Baseline Survey, MNRE, May 2015. This was the first comprehensive WASH survey undertaken at a national scale, by MNRE in partnership with the Samoa Bureau of Statistics (SBS).

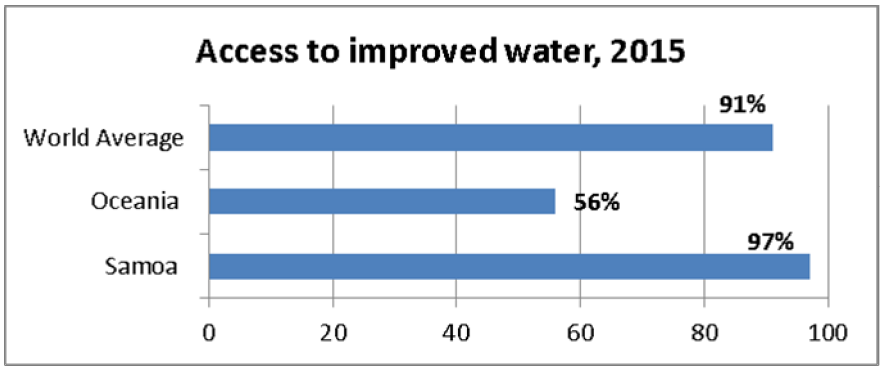


Figure 11:Access to improved water - global comparison (2015 data[26])

Samoa's basic levels of access to water and sanitation are comparable to those of developed countries, however it still lags the developed world in terms of its hygiene standards: this is evident from rates of waterborne diseases such as diarrhoea and typhoid. 'Under-five mortality rates' in Samoa are four times those of Australia. In general Pacific island countries present an incidence rate of diarrhoeal diseases 20% greater than the world average and over four times higher than developed countries such as Australia and New Zealand[27].

While good progress has been achieved in providing the population with access to improved and reliable water supply, the focus now needs to be on improving efficiencies of service, reducing water wastage and pumping costs, improving cost recovery and ensuring future levels of capital and recurrent expenditures are maintained.

The Sector also needs to refocus its efforts to improve standards of hygiene awareness and practice in order to reduce the current high incidence rates of diarrhoea and other water related diseases.

3.1.2 Sector Status

Sector status and performance[28] is discussed below for each of the six key sub-sectors:

1. Sector Governance
2. Water Resources
3. Water Supply
4. Drinking Water Quality Surveillance
5. Sanitation and Wastewater
6. Flood Mitigation

3.2 Sector Governance

3.2.1 Sector Institutional, Policy& Regulatory Framework

Institutional

Since 2005 the EU has supported the water sector in Samoa to establish and build capacity of the essential governance framework necessary to support the sector mandated roles and responsibilities. Initially through the EU-funded Water Sector Support Programme (WaSSP) from 2005 – 2010, which prepared the Sector for transition to a Government led 'sector-wide approach' modality with EU

25 JMP data used for Oceania and Global, MNRE Baseline WASH Survey data used for Samoa.

26 ibid

27 UNICEF Pacific WASH Strategy 2014-2017.

28 Overview of status for each sub sector given, covering the period 2012-2016 i.e. end of the second Sector Plan

budget support. The policy and regulatory framework continues to be refined under the sector wide approach, while the institutional structures are largely considered to be well-established and effectively functioning. An EU-funded evaluation of the water sector governance undertaken in 2013[29] found that:

> *"The water sector in Samoa has largely come of age, with most of the necessary legal and regulatory framework in place, and Implementing Agencies demonstrating increasing competencies in their mandated roles. Significant sector challenges still exist mainly in the practical implementation of roles and enforcement of regulations, and in addressing the sector skills shortage".*

The sector activities cover sector policy and orientation, water resource monitoring and management, water supply services, drinking water quality regulation and monitoring, sanitation systems, and drainage/flood mitigation. The implementing agencies participating in the activities of the water sector in Samoa are:

- **Ministry of Natural Resources and the Environment (MNRE)** – MNRE provides overall leadership and coordination services for the sector as well as having responsibility for water resource management, waste disposal, public toilets, biogas projects and environmental regulation.

- **Ministry of Health (MoH)** – is responsible for monitoring and regulating water quality and sanitation in relation to public health.

- **Ministry of Women, Community and Social Development (MWCSD)** – coordinates Government's support to community managed water schemes through the Independent Water Schemes Association (IWSA).

- **Ministry of Works, Transport and Infrastructure (MWTI)** – provides coordination and policy and regulatory support for drainage and flood control as well as responsibility for the building code, which impact on the regulation of sanitation systems.

- **The Samoa Water Authority (SWA)** – a State Owned Enterprise responsible for the delivery of water supply services for some 80% of the population and manages a pressure sewer system in Apia.

- **Land Transport Authority (LTA)** – is responsible for road side drainage.

- **Samoa Tourism Authority (STA**)- is responsible for the implementation of garden toilets and monitoring of sanitation facilities for hotels and resorts.

- **Independent Water Schemes Association (IWSA) -** provides strategic advice and management of the Independent Scheme developments (IWSs serve approximately 17% of the population of Samoa).

- **Samoa Red Cross Society (SRCS) –** isan auxiliary partner of the government of Samoa in the humanitarian field, active in the Sector, especially in the provision of rainwater tanks and basic sanitation to low income communities.

29 Final Evaluation - Water & Sanitation Sector Policy Support Programme, EC Delegation in Samoa, October 2013.

- **Plumbers Association (PAS)** – is involved in the training of plumbers, and advocates for improvements in the standard of plumbing in the Sector.

The Sector is led by the Joint Water Sector Steering Committee (JWSSC), which meets on a quarterly basis with representation from Ministries[30], agencies, civil society and donors (Figure 12). The JWSSC is the apex body for the water sector, and is a review and decision making body; decisions made by JWSSC can be directed up to Cabinet level for final authority and ratification. Day to day leadership of the water sector is vested in the Water Sector Coordination Unit (WSCU). The WSCU, a Unit within the MNRE, provides secretarial and technical support to the JWSSC and day-to-day coordination and support services for the Sector. The WSCU chairs a Technical Committee for the Sector, which monitors implementation progress and takes the lead in development of sector strategies and policies at a technical level. Below this there a 6 Sub-Committees, which have responsibility for leading and managing in their respective sub-sector component areas, as follows:

i. Water Resource Management – chaired by MNRE

ii. Water supply services through SWA – chaired by SWA

iii. Water supply services through IWS – chaired by MWCSD

iv. Drinking Water Quality – chaired by MoH

v. Sanitation – chaired by MNRE

vi. Drainage and flood control – chaired by MWTI.

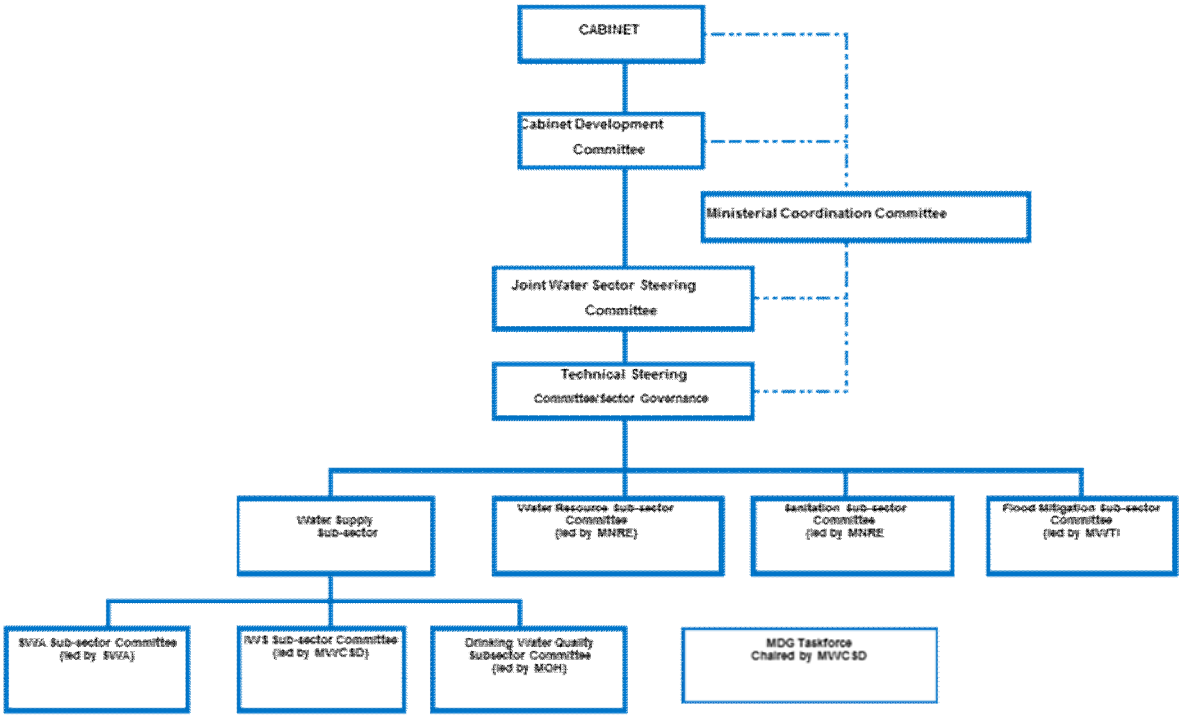


Figure 12:Water and Sanitation Sector Coordination Framework

30At the CEO level.

Institutional capacity building has been a focus of sector strategies in the past and will remain a key focus of the current Water for Life Sector Plan for 2016 – 2020.

Policy and Regulatory Framework

The sector policy and regulatory processes were largely established under the WaSSP and the subsequent Budget Support technical assistance mechanisms. As noted in the 2012 Water for Life Sector Plan "*…the biggest issue is the limited capacity of regulators ….to implement and enforce policies and regulations*". As a result, IAs are now prioritising regulatory compliance and have adopted a more pro-active approach to the enforcement of regulations and to improving standards and building codes (eg for septic tanks).

Table 2 summarises the main legislative instruments and functions of the various government authorities operating within the sector in a regulatory capacity.

Table 2: Regulatory and Institutional Responsibilities

Authority	Legislative basis	Function
Ministry of Natural Resources and Environment		
Planning and Urban Management Agency	Planning and Urban Management Act 2004 and regulations	• **Controls the impacts of structures and activities on the environment e.g. impacts of discharges from wastewater systems** • **Environmental protection and nuisance** • **Manage the wastewater effluent discharge standards**
Division of Environment and Conservation	Lands, Survey and Environment Act 1989 Waste Management Bill 2008 Waste Management Act 2010 Environment Management and Conservation Bill 2013 (draft)	• **Landfill operation and management of sludge treatment, disposal, operation and management** • **Environmental protection**
Water Resources Division	Water Resource Management Act 2008 and regulations Water Resources Management Regulation 2013 Water Abstraction Licensing Regulation 2013 National Upland Watershed Conservation Policy	• **Protect water quality and watershed resources through monitoring, and appropriate management strategies** • **Identifies reserve bands from water sources for protection of water quality** • **Manages water abstraction activities by all water users including water suppliers, water trucks, water bottling companies and others.** • **To protect natural water towers and restrict developments in areas of 600m above mean sea level**

Ministry of Works, Transport and Infrastructure		
Building Division	Ministry of Works Act 2002 (Part IV) (through the Building Code) National Building Code 2017 (draft)	• **Controls building quality including domestic and commercial septic system design and installation** • **CEO may designate road reserve for sewer network**
Ministry of Health		
Health promotion and Preventative Services	Health Ordinance 1959,	• **Requirement for buildings to have adequate provision for wastewater management** • **Promotes public health issues and solutions** • **Prevents outbreak of infectious diseases by stopping discharge of sewerage into receiving water**
Samoa Water Authority		
All Divisions	Samoa Water Authority 2003 and Samoa Water Authority (Sewerage and Wastewater) Regulation 2009	• **Provision of water supply** • **Develop, operate and maintain central Apia sewer system - control and monitor *tradewastes* associated with the system**
Ministry of Women, Community and Social Development		
Internal Affairs Division **Womens Division**	Internal Affairs Act 1995	• **To assist in educational activities delivered at the local village level** • **To provide services for village programmes and development (Aiga ma Nuu Manuia Programme)**
Land Transport Authority		
Procurement & Programming Division	**Land Transport Act 2009**	• **Drainage rehabilitation and routine maintenance**

3.2.2 Sector Coordination

The WSCU acts as the technical secretariat for the Joint Water Sector Steering Committee (the national apex body for the Water Sector), and has been instrumental in facilitating and driving sector processes during the transition to budget support. The WSCU provides day to day leadership of the water sector and can be considered as the essential 'glue' that binds the sector.

The range of activities currently undertaken (or coordinated) by the WSCU includes:

- Sector Coordination and Leadership,
- Sector Policy and Planning,
- Sector Monitoring and Reporting,

- Sector Financial Planning and Monitoring,
- Facilitating Annual Water Sector Reviews
- Updating of Water for Life Sector Plans.

Over the course of this current Sector Plan the WSCU intends to increase its sector role to include:

- Sector Capacity Building, to include the facilitation of a more harmonised approach to capacity building across the sector
- Communication & Publicity, by developing a Sector Communication Strategy

3.2.3 Sector Planning, MTEF Planning and Performance Monitoring

There are now well-established planning and budgeting procedures for the sector. Starting with the four-year sector plans, subject to periodic review and update, and preparation of the 3-year Medium Term Expenditure Framework (MTEF), which has improved the accuracy of sector budgeting and forecasting. Performance monitoring is reported quarterly and through the Annual Sector Performance Review process which is open to public participation.

The challenge now for the Sector is to establish within the WSCU an effective performance monitoring system to collate, review and interpret data from the various IAs. The release of data from IAs in the past has,at times, been rather slow and this has reduced the impact and effectiveness of the performance monitoring. It should be noted that timely data is required if managers and decision-makers are to proactively manage resources effectively, and take effective action to deal with problems arising.

3.3 Water Resources

3.3.1 Watershed Management

Watershed protection and conservation is one of the main priorities for the Water Resources Division (WRD). Maintaining watershed areas under good forest cover assists with regulating flood events during the rainy season, and sustaining river flows during the dry seasons. Unmanaged developments within watershed areas can lead to increased removal of forest cover from riparian environments, increased evaporation, flash floods, and increased water pollution as a result of soil erosion and other land based activities.

Much of the conservation efforts involve the rehabilitation of degraded areas, and the extension of protected riparian environments. A key component of watershed management is community engagement and support in the protection of the forest and vegetation cover in the upland areas as these act as natural water towers which capture, store and gradually release freshwater for domestic, agricultural, industrial and ecological needs. As part of these watershed management efforts, a total of 365.7ha of land in the critical watershed areas has been replanted and rehabilitated to date.

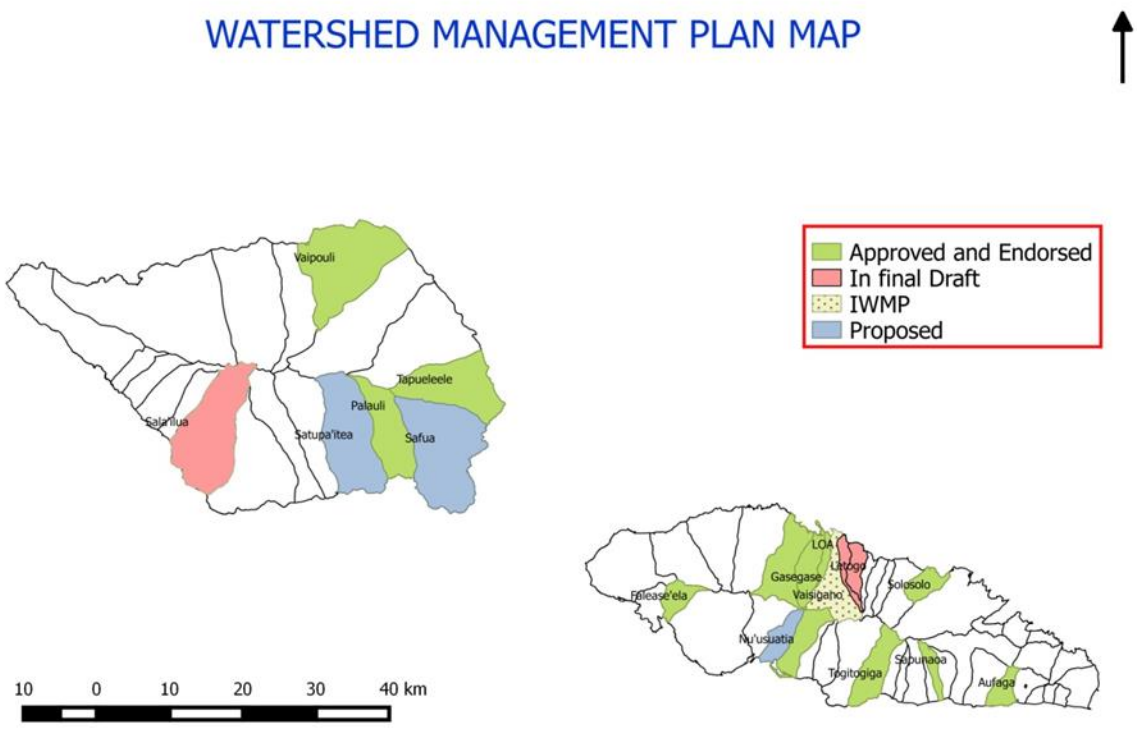
In parallel with catchment rehabilitation efforts the WRD has focused attention on the formulation, implementation and enforcement of Watershed Management Plans (WMPs), and the taking of critically threatened watershed areas (upstream) as reserves.

There is in-house capability to develop the WMPs but the number of staff available for the implementation and enforcement of these plans remains a constraint. To date there is a total of 15 WMPs in place, of which 12 have been finalized and endorsed while the other 3 are in final drafts for

Cabinet endorsement. Another three WMPs for Safua, Nuusuatia and Satupaitea are currently under development, together with the Integrated Watershed Management Plan for Vaisigano which is currently being put together under the Economy Wide Adaptation to Climate Change (EWACC) Project.

All WMPs in place covers an area extending over 118 villages over Samoa. Some of the interventions that have taken place as part of the implementation of these WMPs include the fencing off of watershed catchment areas, the establishment of community nurseries within the villages, as well as the installation of trash stands in targeted areas (in collaboration with SPREP), to combat littering within our river systems and streams.

In addition, the WRD plans to complete and implement a further 12 WMPs during the tenure of this Sector Plan.



3.3.2 National Hydrometric Network

The regular maintenance of water resources monitoring equipment and stations of the National Hydrometric Network is a focus under this component to ensure that information is accurately gauged and stored until it is updated into the National Water Resources Information System (NWRIMS). This network of monitoring stations is annually expanded to ensure that all parts of the country are adequately monitored and currently consists of 15 rain gauges, 13 water level and flow gauges and a total of 22 monitoring boreholes that have been drilled and installed around the country. Long term monitoring and data collection will contribute to improved understanding of water sources and catchments and improve water resources management. Thus far, three water level stations (Alaoa East, Faleata & Seugagogo) and two rain gauges (Le Pu'ē & Tiavi) have been upgraded to telemetry system.

3.3.3 Water Abstraction Licensing Scheme

The Water Abstraction Licensing Scheme has been in effect since 2009 but was not fully in implementation until the endorsement of the Water Licensing Regulation on the 12 June 2013. To date, WRD has licensed 16 Surface water users and 26 groundwater abstraction activities under this scheme. All licensed water users are required to submit quarterly reports on all abstraction activities to give an indication of the amount of water abstracted from our water resources.

In addition to the issuance of abstraction licenses, there is also the drilling permits in efforts to control drilling activities that may otherwise affect the quality of groundwater resources. WRD has issued a total of nine (9) drilling permits to date and these have been mostly for hydro-geological research purposes. The WRD is in the process of developing a Water Abstraction Fees and Charges scheme to further impose control over abstraction activities by all water users. These charges shall be fixed with due regard to the objectives of the Water Resource Management Act 2008.

3.3.4 Knowledge and Understanding of Water Resources

To date, Upolu Island consists of eighteen (18) monitoring boreholes with seven (7) in Savaii to monitor groundwater levels. The availability of fresh groundwater is controlled mainly by the age and degree of weathering of rock formations. Basalt aquifers occur at low elevation in the younger, less weathered, more permeable formations such as Mulifanua, Lefaga, Puapua and Aopo formations. Fresh groundwater emerges at the coast in the form of a large number of discrete springs which occur above and below mean sea level.

Collection of data on water levels, abstraction rates, water quality and quantity are all conducted by WRD while the pump tests are carried out in collaboration SWA to determine safe yields. The safe yield of an aquifer or a borehole is the amount of water that can be abstracted in a given time without exceeding the natural recharge rate of the groundwater regime.

Groundwater resource evaluation and assessment is based upon aquifer geometry, aquifer characteristics (transmissivity and storability), recharge and water balance, monitoring and water quality. This information also assists in building a regional picture of the hydrogeology and is required for assessing safe pump yields and the location of screens and pump inlets.

3.3.5 Regulatory Framework

The implementation of the Water Resources Management Act 2008 remains a priority for WRD. The Act enforces the licensing of water developers and elicits essential information from licensees on rates of water abstraction from the catchment. The Act also enables the issuing of Precautionary Notices to curtail the illegal disposal of waste into rivers and streams. This measure has had some success in the past but there have also been instances of resumption of illegal disposal by parties served with Precautionary Notices. The WRD intends to step up enforcement in order to control and eradicate instances of non-compliance. For these purposes, three new bylaws are targeted to be developed per Financial Year to increase compliance in support of the objectives of the Act. Strengthening collaboration with other stakeholders will also be prioritised as a measure to reduce non-compliance.

In support of the Act, a number of Regulations are also in place to address the gaps in the legislation. These include the Water Resource Management Regulation 2013, and the Water Licensing Regulation 2013. The WRM Regulation highlights (among other areas) the declaration of easements and reserve bands while the Water Licensing Regulation outlines the requirements under the Water Abstraction Licensing Scheme.

The Water Resources Division has also endorsed the National Upland Watershed Conservation Policy which is aimed at protecting our natural water towers. However, enforcement of this policy has been a challenge and the WRD are in the process of developing this policy paper into a Regulation with more enforcement power.

In addition, the WRD is in the process of developing a National Drought Policy/Contingency Plan and it is anticipated that this document will be in place before the end of the upcoming FY 16/17. This document will assist greatly with establishing an effective framework to improve the preparedness, mitigation and response of the country to drought risks and impacts.

As part of the watershed conservation efforts, an Integrated Watershed Management Plan for the Vaisigano catchment is currently being developed under the Economy-wide Adaptation to Climate Change project. This IWMP is taking a ridge to reef approach to address up and down-stream causes and effects of climate vulnerability within all five watersheds in the Greater Apia area.

3.3.6 Partnerships

The WRD undertakes regular community consultations in watershed areas, and provides technical assistance to communities to assist with catchment rehabilitation and strengthen partnerships. This has been an effective approach which will be continued in the future.

As part of its community engagement efforts, WRD has signed Memorandum of Understanding (MoU) with a number of villages to gauge their support in water resource management activities such as the rehabilitation of catchment areas through replanting. These villages include Lepa, Aufaga, Letogo/Vailele, and Faleaseela.

Through its bi-monthly subsector Technical Committee meetings, the WRD engages with its stakeholders on a regular basis. These stakeholders include all the key Implementing Agencies within the Water Resource Subsector including the Meteorology who continue to provide rainfall and temperature data which is relevant to monitoring water resources, the Samoa Water Authority who are the main water supply utility service in the country, and also the Scientific Research Organization of Samoa who are continuously engaged to carry out internationally certified water quality testing.

3.4 Water Supply

The Samoa Water Authority (SWA) is a State Owned Enterprise responsible for the delivery of water supply services for some 80% of the population. A further 18% of the population are provided by water from Independent Water Schemes (IWSs) which are village owned and managed systems. The Independent Water Schemes Association (IWSA) provides a level of oversight and support to the IWSs. The remainder of the population (approximately 2%) that cannot access piped water services of SWA or from IWSs are largely reliant on rainwater, streams and springs for their water needs.

Significant support to the rural and urban water sector has been provided over the last decade and this has resulted in a measurable improvement in service levels greatly benefiting communities. However, the water sector continues to face significant challenges, foremost being the ability of the core service providers (SWA and IWSA) to operate and maintain their water supply systems, and reduce unacceptable levels of water wastage. The current status of the water supply sub-sector is discussed below in terms of its key defining characteristics.

3.4.1 Population and Service Coverage

SWA mandated areas cover approximately 22,450 customers, which is about 85% of the total population of Samoa[31]. It is estimated that SWA serves approximately 81% of the population at June 2015, an increase from 77% since June 2013. Overall SWA coverage is reported in Table 4 below:

Coverage of piped network has expanded over the years as a result of increased capital investments into the establishment of new schemes and extension of existing networks. Major capital works successfully completed are as summarised in Table x in addition to small submain installation for newly inhabited areas.

Table 3: SWA Projects implemented to increase coverage

Financial Year	Projects Implemented
FY 2012/2013	Falealupo and Neiafu South East Upolu -Saleapaga
FY 2013/2014	Extension of Neiafu scheme to supply Tufutafoe and Falelima Vailele and Aleisa Packaged plants installation Falelauniu Borehole Phase 1
FY 2014/2015	Vailele Phase 1
FY 2015/2016	Falelauniu Phase 2 (March 2015 - August 2016) Aleisa Phase 1

3.4.2 Customers Billed

The total number of customers billed has increased considerably since June 2012 (Table 4). Capital works have focused on extending services to new customers through network expansion as well as on improving services to existing customers through upgrades to the current distribution network. Emphasis has also been placed on identification of illegal connections as well as metering flat rate customers receiving treated water further improving billing efficiency.

31 SWA Annual Report 2014 – 2015

Table 4: Customers Billed

Operation Area and Type	June 2012	June 2013	June 2014	June 2015
Urban – domestic	6024	6527	6956	7178
Urban – commercial	462	486	504	554
Total Urban	**6486**	**7013**	**7460**	**7732**
Rural - domestic	5279	5994	6563	6366
Rural – commercial	75	74	83	98
Total Rural	**5354**	**6068**	**6646**	**6468**
Savaii – domestic	3268	3339	3519	3643
Savaii - commercial	157	154	153	165
Total Savaii	**3425**	**3493**	**3672**	**3808**
Total SWA service	**15265**	**16574**	**17778**	**18004**

3.4.2 Levels of service

With respect to Levels of Service, the principal areas monitored by SWA are:(a) the reliability of supply; (b) pressure control in the network; (c) water quantity provided to each household, and; (d) water quality.

a. Reliability of Supply

About 65% of SWA customers supplied by the slow and rapid sand filter water treatment plants. These customers receive 24 hour supply while customers connected to borehole schemes receive intermittent supply depending on the pumping hours. This excludes planned and unplanned disruptions and restrictions caused by drought conditions. Water trucks for carting and standby sources (boreholes) are in place to ensure reliable water supply to all SWA customers.

IWS customers are beneficiaries of gravity supplied water from springs or streams located at higher elevation, obviating the need for pumping.In general, therefore, IWS customers receive a 24-hour supply of water.

b. Pressure Control in the network

A minimum service pressure of 1 bar is generally achieved at household meters in accordance with SWA design standards. Pressure management has been the focal point for reduction in NRW with emphasis placed on the CBD District of Apia. Low pressure areas have improved through pipeline replacement and relocation works, leak detection and repairs, with high pressure areas of over 6 bars resolved through DMA isolation and PRV replacement works. Overall NRW reduction program is assisting in the control of network pressure.

c.Water Quantity

With regards to the water quantity provided by SWA to each household, SWA's records of all customers billed and the overall usage of water by category (domestic and commercial) and by location were used to determine the average usage for the period 2012 to 2015 as presented

Table 5: Water Consumption

Operations Area/Year		Dom Usage L/conn billed/d	Comm Usage L/conn billed/d	Domestic Consump L/pers/d	Dom Usage L/conn billed/d	Comm Usage L/conn billed/d	Domestic Consump L/pers/d	Dom Usage L/conn billed/d	Comm Usage L/conn billed/d	Domestic Consump L/pers/d
		2012-2013			2013-2014			2014-2015		
Upolu – urban		1,188	7,720	175	1,093	7,695	144	1,291	7,871	190
Upolu - rural		1,063	15,469	146	1,089	16,811	176	1,331	13,832	182
Savaii		1,100	3,800	150	1,089	4,210	143	1,057	4,424	145

Average water consumption for SWA customers is in the range of 140 to 180 litres per person per day (L/c.d) which is comparable to international norm of between 150 and 200L/c.d. The SWA aims to further reduce per capita water through demand management practices to encourage wise water usage to preserve and conserve water resources.

Water provided to IWS customers is currently unmetered and subject to a flat rate tariff. IWS customers therefore have little incentive to conserve water. The IWSA intends to pilot the introduction of household water meters in the near future.

a. Water Quality

The SWA gives priority to improving the quality of water it supplies through improvement works at treatment plants as well as borehole sites. An upgrade to the Malololelei, Alaoa, Fuluasou JR and Fuluasou EU's chlorination facilities was completed in 2014 which improved levels of operation from manual stirring to electrical agitators, quantifiable chlorine dosage and improved operator response through auto dialler devices. Compliance to Samoa National Drinking Water Standards (SNDWS) has improved as a result. Full compliance was achieved in the FY 2014/15 and FY 2015/2016 for all twelve months exceeding the targets of 75% and 80% respectively. Actions to further expand coverage of disinfected supply to all Rural and Savaii areas is well underway.

In addition to compliance water quality monitoring undertaken by the MoH, SWA's Water Quality Unit undertakes its own water quality monitoring for operational purposes, using its own laboratory facilities. The frequency in monitoring of all supply schemes by the Water Quality Unit has also increased in the last twelve months. This has allowed SWA to be more proactive in ensuring safe water supplies to its customers.

IWS customers receive untreated water which, in general, does not meet the drinking water standards. IWS water quality is assessed against a raw water standard of "<10 E.Coli per 100ml " with compliance performance targets set for each year. Since the water is not of drinking water standard communities are advised to treat their water prior to drinking. A risk management Water Safety Planning approach is adopted to safeguard raw water quality of IWSs.

3.4.4 System Efficiency

a. Water Loss Management

Concerted efforts by SWA on water loss management over recent years has resulted in the gradual reduction of Non-Revenue Water (NRW). This has been achieved despite the damage to the pipe network by Cyclone Evan in December 2012 which led to a marked increase in water loss. The target

of 3450 L/connection/day for the 2014/15 financial year was achieved with a weighted average of NRW of 3430 L/connection/day.

In undertaking a systematic Water Loss Management program SWA is being assisted by the Japan International Cooperation Agency (JICA) through the provision of Technical Assistance under a project called 'Capacity Enhancement Project – Samoa & Okinawa (CEPSO). This project aims to enhance the capacity of staff through exchange of knowledge, ideas and methods by SWA and Okinawa counterparts on the subject of water loss management. This 5 year collaboration (2014 – 2019) will mainly focus on the Alaoa water supply system with emphasis on water loss monitoring and reduction method through District Management Areas (DMA) isolation, flow logging, analysis and management.

The water loss management approach addresses physical losses through 'Pressure Management' and 'Leak Detection' works, with the establishment of District Management Areas and the installation of pressure reducing valves to continuously log and monitor system pressures contributing to leaks.

Table 6: NRW Percentage (Annual averages)

Division	Units	2012 - 2013	2013 - 2014	2014 – 2015
Urban[a]	%	70	68	64
	L/connection/day	4006	3582	3430
Rural	%	68	66	62
Savaii	%	72	72	70

Improvements to the SWA customer database have also enabled Illegal connections to be identified and disconnected. Other improvements include metering programs to replace faulty meters, relocation of meters to accessible areas and gradual reduction in the number of meter flat rate customers.

In addition to water wastage is the revenue lost through unbilled authorised consumption such as water used for operational purposes, firefighting as well as water carting when required. SWA is currently investigating measures to better account for these uses.

IWSs have benefited from major upgrades under the previous Sector Plans and this will continue under the current Sector Plan. The upgrades have restored elements of the systems to good operational condition. However, the water systems are still affected by poor quality of household plumbing, and by excessive rates of household consumption. The absence of household metering means that a consumption-based tariff regimen cannot be applied for the time being. The IWSA intends however to pilot the introduction of household metering under this Sector Plan timeframe.

b. Staff Utilization

The utilization of labour is one of the most important operational parameters that impact upon overall efficiency. A commonly used indicator of staffing efficiency in the water industry is 'Staff Utilisation per 1000 Connections'. For the Pacific water utilities, the average was 10.8 for the year 2013[32].

The ratio for SWA overall remains at 12staff / 1000 connections billed[33]. Despite the increase in staff from 228 to 254 in June 2015, the number of connections has also proportionally increased,

32 Pacific Water and Wastewater Utilities Benchmarking Report, 2013
33End of June 2015.

accordingly the staffing ratio has remained constant. This is rather high in comparison with international norms for the operation of urban water supply infrastructure and reflects the fact that SWA serves a significant rural component of supply and high numbers of staff are needed for meter reading and for disconnection teams. The median for the water utilities in New South Wales, Australia is 1.8 staff per 1000 connections.

The IWSs are community managed with operational roles performed as required by community members on a voluntary basis. Lack of treatment and the absence of pumping greatly reduces the need for operational interventions.

3.4.5 Financial Performance

With respect to Financial Performance, the principal indicators monitored by SWA are:(a) cost recovery; (b) collection efficiency; (c) operational unit cost of supply.

a. Cost Recovery

Table 7 indicates the cost recovery results for SWA for Financial Year (FY) 2012 / 2013 /2014 /2015 This is the ratio of revenue from water sales to total operational costs excluding depreciation. The noted increase in the FY 2014-15 is attributable to an increase in revenue for the year a stable operational cost for the year.

Table 7:SWA Cost Recovery for Water Supply

Year	Year Average Cost Recovery
FY 2012 - 2013	76%
FY 2013 - 2014	78%
FY 2014 - 2015	87%

b. Collection Efficiency

SWA has made progress on improving revenues and significant emphasis has been placed on collections and revisiting accounts that were marked disconnected (and non-responsive to contact by SWA) as well as metering customers that were charged on flat rate basis but receiving treated supply. These efforts have resulted in increased water revenue and collections.

Table 8: Average Number of Customers Billed per Month

Operational Area and Type	June 2012	June 2013	June 2014	June 2015
Domestic	14,571	15,860	17,038	17,187
Commercial	694	714	740	821
Total SWA Service	15,265	16,574	17,778	18,008

Table 9presents the Collection Efficiency for domestic water use for the period June 2012 to June 2015. This is the ratio of water usage payments received to water use charges. For FY 2015 SWA achieved an average Collection Efficiency of 113% significantly higher than the established target of 80%.

Table 9: Collection Efficiency

Year	Year Average Collection Efficiency
FY 2012 - 2013	78%
FY 2013 - 2014	84%
FY 2014 - 2015	84%

c. Operational Unit Cost Analysis

SWA operational efficiency has improved over the years with steady reduction in costs per m^3. Figures for the FY 2012/2013/2014/2015 shows that a drop in unit cost can be compared to increase in average revenue from water sales as well a reduction in NRW.

Table 10: Unit Cost of SWA Water

Year	Unit Cost of Water Sold (SAT/m^3)
FY 2012 - 2013	2.32
FY 2013 - 2014	2.06
FY 2014 - 2015	1.93

3.4.6 Independent Water Schemes Association

The Independent Water Schemes Association (IWSA) is an NGO and umbrella organisation[34] for the 34 community-managed Independent Water Schemes (IWSs)[35] that provide piped water to rural communities. The IWSs provide water to approximately 18% of the population of Samoa. All IWSs are supplied by gravity from either a river or a spring source; the water provided is untreated and un-metered.

Rehabilitation of IWSs

The Ministry of Women, Community and Social Development (MWCSD) in association with the IWSA is responsible for implementing and monitoring the upgrade and rehabilitation of the 34IWSs with funding provided by the sector. This has been an ongoing and core task for the IWSA and to date 24 IWSs remaining to be rehabilitated over the period of this Sector Plan. By the end of the current Sector Plan, in 2020, it is envisaged that all of the 34 registered independent water schemes will have been rehabilitated.

Operation and maintenance of the IWSs is the responsibility of the village water committees. A key function of the IWSA is to provide training to the village water committees in:

- planning
- financial management
- maintenance
- water safety & watershed

34 The IWSA is answerable to the Ministry of Women, Community and Social Development (MWCSD).

35 The 34 schemes currently serve 62 villages.

- management
- user rules & communication

Other activities of the IWSA include:

Drinking Water Safety Plans

One of the main challenges for IWSs is water quality, since treatment is not provided, nor deemed feasible for community level operation and maintenance. Hence Drinking Water Safety Plans (DWSPs) are considered to be an effective approach to manage and mitigate risks to water quality, from source to consumer.

Preparation of DWSPsfor the IWSs is a core responsibility and ongoing activity for the IWSA. Under the previous Water for Life Sector Plan (2012 – 2016) 10 DWSPs were prepared and under the current plan a further 16 DWSPs will be prepared with the remaining to be done thereafter.

Household Water Treatment

In addition to DWSPs, the IWSA is promoting household water treatment as an effective strategy to empower communities to manage their water quality at the household level. Trialling of a selection of treatment technologies considered appropriate for household application has been carried out. Under the current Sector Plan household water treatment will be further promoted for take-up by householders.

Water Quality Testing and Reporting

Water quality testing[36] for all IWSs is undertaken on a quarterly basis by the MoH, for compliance purposes. For operational monitoring purposes the IWSA has trialled the use of E Coli Testing Kits. These will enable the IWSA to verify effectiveness of control measures taken, assist with implementation of DWSPs, and to problem solve water quality issues.

IWS Cost Recovery

The IWSs are still plagued by low tariff levels (typically 10 Tala per month per household) and low collections rates with only 50% of IWSs reporting any tariff collections[37]. Sustainability of operations is therefore a major concern. The combination of low flat-rate tariff structure and unmetered household supplies do not encourage responsible water use. Under the current Sector Plan the IWSA will place renewed emphasis on the setting of realistic tariffs and tariff collection by IWSs.

Constraints

For IWSA, staffing and capacity remains an ongoing challenge. In particular, IWSA lacks in-house technical capacity which has to date been provided on a more or less continuous basis through the services of a volunteer engineer (from Australia or NZ).

With the completion of the rehabilitation of the IWSs, the focus of IWSA will shift from contract management and tendering to monitoring of IWSs, improving standards of operation and maintenance, coordinating a standardised tariff and collections approach, implementing the household water treatment strategy, etc. Training of IWSA staff will be required to prepare them for the new roles and scope of activities.

36 Sample taken from consumer tap only.

37Water and Sanitation Sector – 8th Sector Annual Performance Review, Draft Report 2014-2015 (Table 4.14).

3.4.7 Plumbers Association of Samoa (PAS)

The PAS is a statutory body, established and registered in 2010. From its formation PAS saw the need to improve plumbing standards and raise the profile of plumbing in the country. Through its participation in the water sector, PAS has the objective of strengthening the plumbing trade in Samoa through quality of workmanship and the high competency of its members; enhance quality of technical skills through compliance to standard practices, use of appropriate materials and implementation of plumbing works by qualified and registered plumbers.

The focus of PAS to date has been the regulation and training of plumbers with the outcome of improving the overall standard of plumbing in Samoa. This is now enshrined in PAS Regulation 2015 which is now in the process of being enforced by PAS.

A register of certified plumbers has been established. The focus of activities for the current Sector Plan phase is the ongoing training of plumbers and to increase the number of registered plumbers.

PAS will also undertake a pilot survey to assess plumbing standards in a sample of rural households. This will enable the sector to gain a better understanding of the status of plumbing, identify major issues and propose rectification measures.

3.4.8 Rainwater Harvesting

With the increasing focus on efforts to target the Sector's resilience to impacts of climate change and climate variability, there has been renewed attention and interest in promoting rainwater harvesting in the Sector.

Rainwater is an important water source for households that do not have access to a piped water connection. Many of the households that rely on rainwater as their primary water source can be classified as vulnerable and of low socio-economic status. Additionally, households reliant on rainwater typically would have only a basic form of sanitation such as a pit latrine.

Results of the Baseline WASH Survey (MNRE, 2014) indicate that although 16.4% of households have access to a rainwater tank, less than half (i.e. 7.4%) of households use this as their main drinking water source. Rainwater is an important water source for more remote rural communities that do not have access to a piped water connection from either SWA or an IWS. Rainwater use is highest in Savaii where 13.7% of households use it as their main water source.

At the community level, the Samoa Red Cross Society (SRCS) is considered to be the best placed institution to implement the Sector's rainwater harvesting initiative given its historical role in community welfare projects and in disaster relief and mitigation.

The EU-funded Millennium Development Goals (MDG) Project was a sector initiative targeting vulnerable[38] communities without access to piped water supply. Under the MDG Project, 1,200 vulnerable households were provided with rainwater tanks and VIP latrines, as well as vegetable gardens. The MDG Project was implemented by the SRC with the assistance from the Ministry of Women, Community and Social Development namely when consultations were held with the benefiting communities and in particular, the implementation and development of vegetable gardens. As part of the project the SRC provided training to households on maintenance and cleaning of their rainwater tanks, as well as education on good hygiene practices. As a result of the MDG Project the

38 For the purposes of water and sanitation coverage, vulnerability can be defined in terms of lack of access to improved water and sanitation, typically also associated with low socio-economic status.

SRCS has developed its skills and expertise in community level water and sanitation initiatives, and is well-placed to be the connection between the Sector and the community in programme delivery in these areas.

Efforts are also being made to collect and consolidate information on rainwater tanks and rainwater harvesting projects and to map out all rain-fed systems for strategic planning and monitoring purposes at the community and national levels[39].

3.5 Sanitation

3.5.1 Access to basic sanitation

A key internationally used JMP benchmark indicator is the 'percentage of the population that uses an improved latrine '. For Samoa as a whole, the percentage of the population using an improved latrine (sanitation facility) is 97%. Since most households in Samoa have access to piped water, the most common type of latrine in use is the flush toilet with septic tank.

The EU-funded 'MDG Initiative' which provided VIP latrines and rainwater tanks to 1,200 vulnerable communities has contributed to Samoa's improved status in terms of the key MDG indicator of 'percentage of the population that uses an improved latrine'[40].

3.5.2 Septic tank maintenance and performance

While Samoa has achieved high levels of access to basic sanitation, the challenge and priority for the sector relate to septic tank standards of design and build, operation and maintenance.

In Samoa most sanitation facilities are privately owned, with standards for such facilities covered under the National Building Code 1992[41]. According to National WASH Baseline Survey (2015) 96% of household sanitation facilities use flush toilets with septic tanks (Figure 13). The majority of the septic tanks are thought to be of older designs, many without floor slabs, and consequently discharge directly to the water table. The monitoring of groundwater quality is limited to measurements of *E.Coli* and *Total Coliforms*, and the results indicate the impact of septic tanks on groundwater quality is significant and a potential health hazard. Currently there are no national effluent standards; however it is proposed to develop these in 2016.

39 MWTI rainwater harvesting technologies noted in National Building Code 2016.

40 National WASH Baseline Survey (2015 data) found 97% of Samoans use an improved sanitation facility. A significant improvement from years 2000 to 2014 when, according to UNICEF/WHO Joint Monitoring Program data, only 91% to 92% of Samoans had access to improved sanitation. Some of this improvement can be attributed to the increased focus on sanitation under the EU-funded MDG Initiative.

41A new National Building Code 2016, is at the final Draft Stage, September 2016.

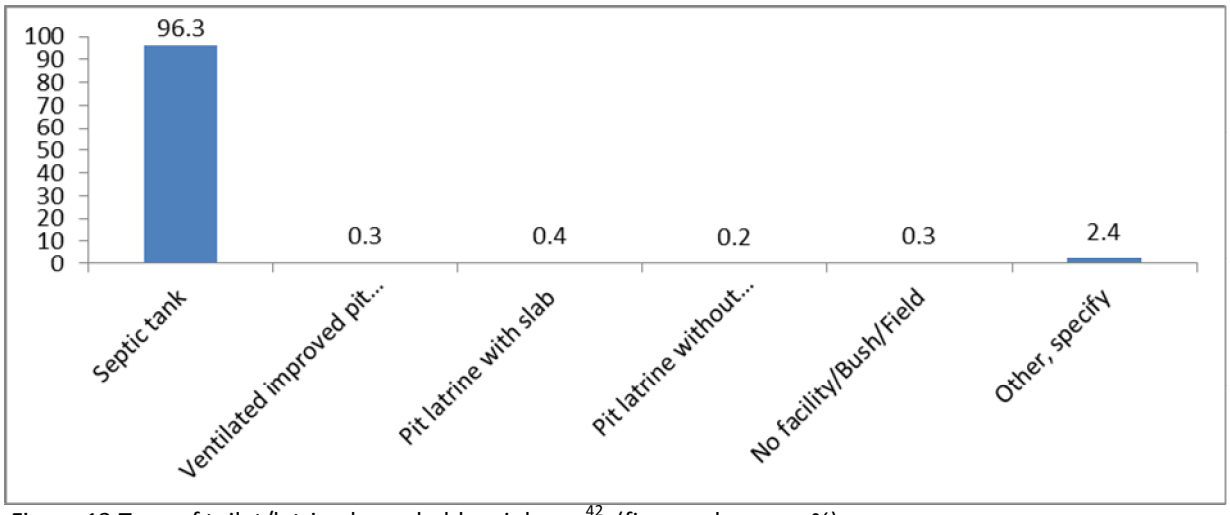


Figure 13:Type of toilet/latrine household mainly use[42] (figures shown as %)

Approximately 80% of householders report that their septic tank has never been full. This indicates that the tanks are in poor condition[43]and explains the low rates of septic tank pump out.

Efforts being made to improve standards of septic tanks include the enforcement of National Building Code 1992[44]for septic tanks, which is now mandatory for all new housing developments. PUMA proposes to carry out research into modified forms of septic tanks which will trial different tank designs, with a view to finding low-cost variants that produce an improved effluent quality.

The predicted increase in rainfall and rise in sea level in the future due to climate change is likely to pose a threat to sanitation nationwide particularly the performance of septic tank systems on flood vulnerable and high water table areas and along the coastal strip of Samoa. The ADB funded Community Sanitation Project has identified and replaced dysfunctional septic systems for households living within flood prone areas in seven villages, including Apia. Suitable septic systems, designs and appropriate setback are stated in the proposed new National Building Code 2016and will be closely supervised and monitored.

3.5.3 Septic tank desludging and septage disposal

A number of private sector companies provide septic tank pump-out services on a user-pay basis.The relative high cost of pump out, due to the remoteness of the sludge treatment facilities, acts as a further disincentive to householders to pump out their septic tanks.

After pump-out, the septic tank sludge is transported to sludge facilities for treatment and disposal. The sludge facilities are managed and operated by MNRE Division of Environment and Conservation (DEC). Currently there are three sludge treatment facilities operating on Upolu island, and one facility on Savaii.

Improved septic tank build standards, resulting from compliance with the National Building Code 1992, will lead to improved septic tank operation and performance, improved quality of effluent being discharged to soakage pits, and higher rates of septic tank pump out.

42 Taken from National Water and Sanitation Baseline Survey, MNRE, May 2015.

43 EG high rates of leakage from the tanks, or that the tanks lack floor slabs so discharge directly to soil; without retention. There are also cases where septic tanks discharge directly to rivers.

44Review of new Building Code 2016 in the process.

The existing Public-Private Partnership Initiative for solid waste collection has been identified as an option to increase public awareness on the importance of pump-out and mapping of households using the service on a regular basis. The need to upgrade existing sludge treatment facilities and build additional sludge treatment facilities around the country, to increase capacity, then becomes a priority should there be a resulting increase in rate of household pump-out as targeted.

3.5.4 Hygiene

Hygiene remains a key component of a successful water and sanitation intervention and is essential to consolidate the health gains made through improved access.

While the sector has made good progress in improving access to water and sanitation for the population of Samoa, the data indicates that standards of hygiene awareness and practice will need greater focus if it is to achieve similar levels of improvement.

As noted earlier (Section 3.1.1):

> *"Samoa's basic levels of access to water and sanitation are comparable to those of developed countries, however it still lags the developed world in terms of its hygiene standards: this is evident from rates of waterborne diseases such as diarrhoea and typhoid. 'Under-five mortality rates' in Samoa are four times those of Australia."*

The incidence of diarrhoea is a commonly used indicator of health status, and (by correlation) hygiene awareness and practice. Rates of diarrhoea show a seasonal variation (Figure 14), corresponding to the rainy season in Samoa, but remain high, above threshold levels[45] .

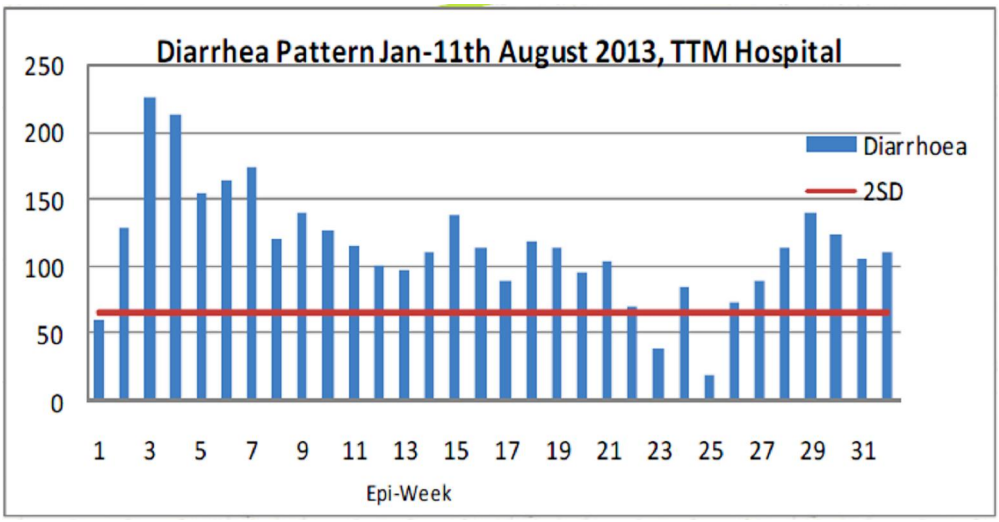


Figure 14: Diarrhoea Pattern. ***Source: Ministry of Health Samoa data.***

The National WASH Baseline Survey (MNRE, 2014), used handwashing practice (with soap) at critical times to assess hygiene practice at the household level. It is recognized that the three critical times for hand washing with soap are:

1) After visiting the toilet,

2) Before preparing meals, and

3) Before eating.

45 Shown by the horizontal red line. Note the high peak in Epi week 3 corresponds with Cyclone Evans.

The WASH Baseline Survey results reveal that in almost half of cases, or about 45%, respondents do not wash their hands at any critical times. Only a quarter, or 24%, reported washing hands at the 3 critical times. By region, Savaii had the lowest rate of handwashing[46].

The hygiene and health data support the need for the Sector to increase its focus on hygiene awareness with a view to changing communities' knowledge and behaviours to improve health outcomes.

3.5.5 Accessed to improved Public sanitation facilities

Much improvements have been made with the public's access to sanitational facilities as well as the quality of facilities due to the introduction and the development of garden toilets in 2015 and 2016 and the ongoing monitoring, maintenance and upgrades to public toilets. There are 5 garden toilets completed and are located at Tiavea, Lotofaga, Togitogiga, Tofuola Saleimoa and Manono Wharf.The Garden Toilet Concept was developed by the National Beautification Committee to give a fresh look upon sanitation, and also provide much needed rest stops around Upolu and Savaii Islands for tourists.

Moreover, ongoing monitoring and maintenance works have been done at the sludge treatment facilities at Tafaigata and Vaiaata with approximately, 80 truckloads of sludge per month are disposed off at the Tafaigata which is equivalent to 3,000 tons a year. A contractor will be onboard soon to install the geomembrane lining at the Vaiaata Landfill to reduce and prevent contamination of the underground water from the disposal.

3.5.6 Wastewater Collection and Treatment

Built in 2008 and commissioned in August 2009, the wastewater plant has maintained effective operation and maintenance of its wastewater treatment plant and network.

- Initial tariff of $8.30 , $5.60 was reduced by 35% in April 2012 as a result of customer dissatisfaction with high costs
- Delayed implementation of sewer line extension due to availability of funds
- Phased approach in implementation with initial sewer line installation with more delays experienced with customer willingness to connect.
- In 2013, a program aimed at reducing non-revenue wastewater was implemented with detailed ingress investigations at major commercial properties throughout the CBD. This program is ongoing with the aim of reducing stormwater infiltrating into sewer line.
- In 2015, the sewer line extension to Mulinuu peninsula was completed with added to the existing network with the phased approach of connecting customers.
- By the end of FY15-16, all commercial properties along Mulinu'u stretch have been connected, approximately 20+ customers.

46 In Savaii, 77.6% of the population do not wash their hands at with soap at any critical times.

a. WWTP Utilization and Effluent Quality Compliance

Table 11: WWTP Utilization

Performance Indicator Description	Operational Performance				
	Units	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Average daily wastewater inflow to the WWTP	m^3	517	504	542	
Wastewater Treatment Plant utilization	%	41%	50%	54%	66%
Percentage of effluent samples (complying with SPREP standards)	%	100%	100%	96%	100%

Source: Samoa Water Authority

3.6 Flood Mitigation

3.6.1 Apia Urban Area Drainage

The focus of sub sector developments to date has been the Apia CBD and this will remain a critical area for future interventions. Climate change is expected to result in increased heavy rainfall events and this will necessitate further drainage improvements as well as improved maintenance. Drains are frequently blocked as they are used for rubbish disposal in many areas. Since Apia is built on a flood plain the severity of flooding is expected to worsen with sea level rise and future planning of urban development should consider a shift to higher ground. Current investment priorities for drainage rehabilitation and development are guided by the Integrated Apia Masterplan for Water Supply, Sanitation and Drainage 2011.In this Masterplan, 10 most vulnerable sites within the Apia CBD were identified. The designs for these sites were completed in the fiscal year 2014/15 and are currently within the pipeline for implementation.

The existing urban drainage network in Apia CBD consists of underground pipes, closed/covered rectangular/trapezoidal and open drains. These drains discharge to the Gasegase river system (including Fugalei and Asaga) on the east of the CBD to Mulivai River on the west with a few directly to Apia Bay on the north of Apia.

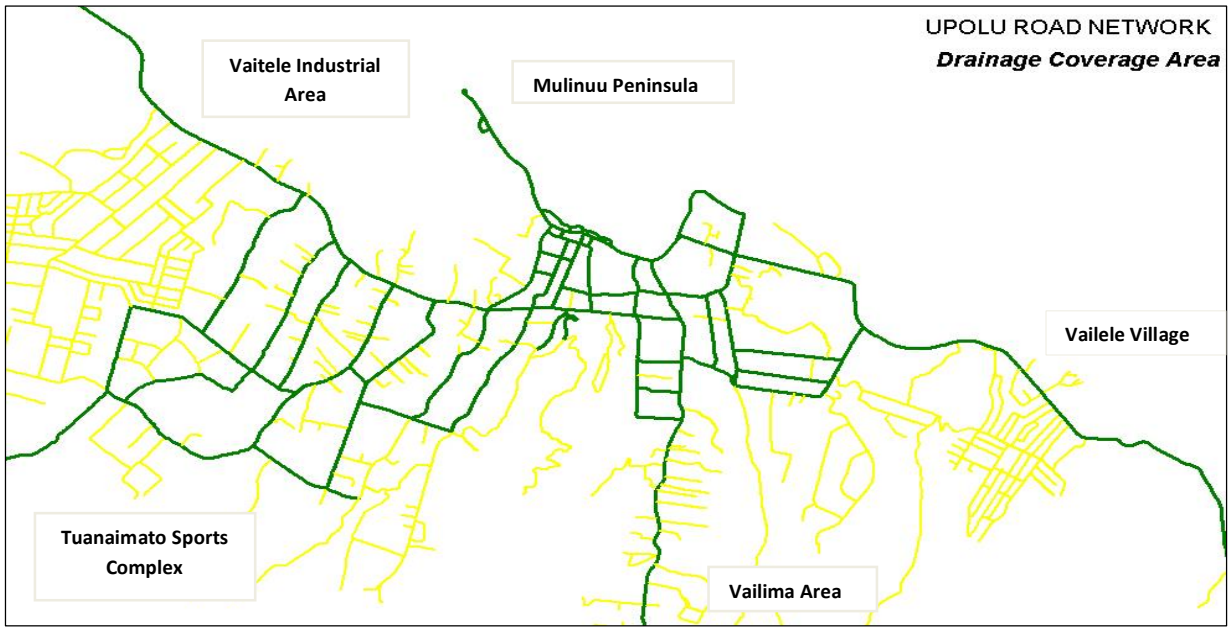


Figure 15:Upolu Urban Area Drainage Network ***Source: Land Transport Authority***

Construction and Upgrade of Drainages

The key focus has been to reduce flooding incidences and flood damage and improve quality of life, particularly for vulnerable communities. This was achieved by resolving flood points within the drainage system. Within the four-year period from 2012-2016, the accumulative length of 10.4km of drainages has been constructed inside the drainage network. The latest addition to these works that were carried out during FY2014/15 involved new drainage upgrades along Fugalei Street. This is one of the worst flooding areas in the CBD, and there were some sections that required entirely new drainages to alleviate flooding problems. These new drainage lines consisted of precast box culverts, as well as imported rubber ring jointed reinforced concrete pipes (RRJRCP). Other drainage upgrades

were also carried out in Moataa/Maagiagi, Tufuiopa and Vaitele. The table and figures below summarize these implementation works.

Figure 16: Drainage works

Image 1: Drainage works along Tufuiopa

Image 2: Drainage works along Tufuiopa

Image3: Drainage works along Savalalo

Image4: Drainage works along Savalalo

Image 5: Drainage works along Fugalei

Image 6: Drainage works along Fugalei

Table 12: Drainage type constructed (Km)

Drainage Type	2011/12	2012/13	2013/14	2014/15	TOTAL
Open Earth	-	-	0.53	0.21	0.74
Open Concrete	-	1.44	-	-	1.44
Open Stone-pitched	-	-	-	3.14	3.14
Closed Drainages	-	3.82	0.14	1.14	5.10
TOTAL	**-**	**5.25**	**0.67**	**4.49**	**10.41**

Table 13: Summary of drainage works

Drainage Reconstruction/Upgrades	Length (km)	Drainage Type Before	Drainage Type After
2011/12			
2012/13	**5.253**		
Upgrading of Fugalei St Drainage	0.455	Open Earth Channel	Closed Drainage (Box Culvert)
Upgrading of Saleufi St Drainage	0.500	Open Earth Channel	Closed Drainage (Box Culvert)
Construction of new drainage along Vaivase Road	0.625	No drainages	Closed Drainage (Box Culvert)
Construction of New Road Extension of Convent St	0.620	No drainages	Closed Drainage (Box Culvert) + Open Concrete
Reconstruction of Cross Island Road Package 1 along Malololelei&Vaoala	1.376	Open Earth Channel	Closed Drainage + Open Concrete
Upgrade of Open drainages along Fugalei	0.238	Open Earth Channel	Closed Drainage (Pipe)
Extension of Vaitele St. Widening (Lepea - Vailoa)	0.770	No drainages	Closed Drainage (RRJRCP's)
Reconstruction of Togafuafua Bridge	0.669	No drainages	Closed Concrete Drainages
2013/14	**0.670**		
SMI Fugalei	0.140	Closed local RCP's	Closed Drainage (RRJRCP's)
Fuafua Street Drainages	0.530	Open Earth Drainages	Open Earth Drainages (bigger capacity)
2014/15	**4.489**		
Fugalei Market Drainage Packages	0.927	Closed pipes/no drainages	Closed Drainage (Box Culvert + RRJRCPs)
Togafuafua Drainages	0.085	Closed local RCPs	Closed local RCPs (size upgraded)
Variation 1 Fugalei Market Package B	0.125	Closed Drainage	Additional Box Culverts
Construction of new drainage along Tamanu Street, Vaitele	0.212	No drainages	Open Earth Drainages
Construction of Moataa/Maagiagi Link Road (including drainages)	3.14	No drainages	Open Stone-pitched drainages
TOTAL LENGTH	**10.41**	Kilometres	

Drainage Maintenance

Maintenance of existing drainage infrastructure also contributes to a reduction of flooding points. Commencing in 2011/12 drainage maintenance has been contracted out to the private sector and parcelled into 6 zones (or maintenance contracts) covering 85.2 km of drains (in FY 2014-15).

Table 14: Drainage Routine Maintenance Contracts Costs By Zone for FY 2011/12, 2012/13, 2013/14, 2014/15, 2015/16

2011/12	**Zone 1 $**	**Zone 2 $**	**Zone 3 $**	**Zone 4 $**	**Zone 5 $**	**Zone 6 $**	**TOTAL**
Open Earth Drain	4,965.00	8,062.00	8,804.00	-	-	-	21,831.00
Open Concrete Drain	9,384.00	736.00	200.00	-	-	-	10,320.00
Open Stone-Pitched Drain	3,917.00	2,281.00	5,565.00	-	-	-	11,763.00
Closed Drainages	-	49.00	15.00	16,348.00	-	-	16,412.00
TOTAL (m)	**18,266.00**	**11,128.00**	**14,584.00**	**16,348.00**			**60,326.00**
2012/13	**Zone 1**	**Zone 2**	**Zone 3**	**Zone 4**	**Zone 5**	**Zone 6**	**TOTAL**
Open Earth Drain	7,410.00	8,025.00	9,050.00	-	-	-	24,485.00
Open Concrete Drain	9,300.00	736.00	200.00	-	-	-	10,236.00
Open Stone-Pitched Drain	4,000.00	1,900.00	5,500.00	-	-	-	11,400.00
Closed Drainages	-	149.00	175.00	16,077.00	-	-	16,401.00
TOTAL (m)	**20,710.00**	**10,810.00**	**14,925.00**	**16,077.00**			**62,522.00**
2013/14	**Zone 1**	**Zone 2**	**Zone 3**	**Zone 4**	**Zone 5**	**Zone 6**	**TOTAL**
Open Earth Drain	10,695.00	10,115.00	11,696.00	-	-	-	32,506.00
Open Concrete Drain	8,813.00	831.00	2,745.00	-	-	-	12,389.00
Open Stone-Pitched Drain	2,025.00	767.00	6,304.00	-	-	-	9,096.00
Closed Drainages	-	227.00	57.00	18,876.00	-	-	19,160.00
TOTAL (m)	**21,533.00**	**11,940.00**	**20,802.00**	**18,876.00**			**73,151.00**
2014/15	**Zone 1**	**Zone 2**	**Zone 3**	**Zone 4**	**Zone 5**	**Zone 6**	**TOTAL**
Open Earth Drain	9,610.00	4,123.00	3,385.00	3,692.00	5,050.00	6,646.00	32,506.00
Open Concrete Drain	8,813.00		285.00	546.00	2,545.00	200.00	12,389.00
Open Stone-Pitched Drain	5,979.00	4,209.00		458.00	131.00	8,921.00	19,698.00
Closed Drainages		3,841.00	6,267.00	5,609.00	3,826.00	1,017.00	20,560.00
TOTAL (m)	**24,402.00**	**12,173.00**	**9,937.00**	**10,305.00**	**11,552.00**	**16,784.00**	**85,153.00**

Table 15: Drainage Type Maintained

Drainage Type	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**By Percentage**
Open Earth	21,831.00	24,485.00	32,506.00	32,506.00	38%
Open Concrete	10,320.00	10,236.00	12,389.00	12,389.00	15%

Open Stone-pitched	11,763.00	11,400.00	9,096.00	19,698.00	23%
Closed Drainages	16,412.00	16,401.00	19,160.00	20,560.00	24%
TOTAL	**60,326.00**	**62,522.00**	**73,151.00**	**85,153.00**	**100%**
TARGET	**-**	**65,000.00**	**70,000.00**	**75,000.00**	
COMMENTS	**Baseline**	**Not Achieved**	**Achieved**	**Achieved**	

Community Drainage Maintenance

The Drainage Committee (Komiti o Alavai) administers the maintenance of off road drainage infrastructure that are out of the Land Transport Authority jurisdiction only within the Apia Central Business District (CBD). The Committee undertakes two monthly assessments to monitor the performance of families that are responsible for their allocated section of the drainage network. The maintenance of these drainages are funded under the LTA Budget support since the Authority's establishment in 2009. This maintenance program involves the clearance and removal of rubbish, vegetation and built up silt that may result in drainage blockage.

3.6.2 Enabling Environment

Measures undertaken to strengthen the enabling environment for flood mitigation indicatives have included:

- Review of principal legislation
- Developing Flood Management/Mitigation Policy
- Developing MoU to clarify roles of LTA and MWTI

The development of a Drainage Design Manual, earmarked for completion by 2015, has been pushed back due to staffing constraints, and will be re-included for completion during the tenure of this Sector Plan.

3.6.3 Key issues and constraints

The following issues have impacted on the sub Sector's ability to achieve its sector strategies and targets, and will need addressing by the sub Sector going forward:

- Overdue review of principal legislation (MoW Act 2002) has been delaying other activities by MWTI
- Limited number of awareness programs facilitated by the sub Sector partners to promote effective monitoring and management of all public drains especially in the Apia urban area
- Rate of vandalism within the Apia urban area, contributing to destruction and removal of drainage assets such as sump covers and signs
- Lack of technical staff to support the implementation of works: Throughout the years, there has been a turnover of technical staff, straining existing human resources, which also play a role in the implementation of activities.
- Budgetary constraints: Since 2011/12, there has been a decrease in the available funds from the Water Sector to the Flood Mitigation Sub-sector for the implementation of its activities. As such, the LTA, as the lead Implementing Agency, will need to prioritize the maintenance of drainages over the construction of drainage upgrades. The issue will then impact on the ability of the Subsector to meet its target for the cumulative number of drainages constructed within the CBD.

3.7 Drinking Water Quality & Health Surveillance

3.7.1 Water Quality Monitoring

The guiding framework for monitoring and regulating drinking water quality is provided under the Ministry of Health's Act 2006, Health Ordinance 1959, Food Act 2015 and the National Drinking Water Standards 2008 (NDWS).

Ministry of Health Water Quality Unit (National Health Surveillance & International Regulation Division) is responsible for the sampling and testing of drinking water for the purpose of assessing levels of compliance with National Drinking Water Standards, as well as to monitor performance against water quality targets established in the Water for Life Performance Framework.

Water quality analysis is conducted based on the frequency of testing given in the revised NDWS as follows:

- SWA network (end points) monthly; treatment plants and borehole supplies monthly;
- IWS systems (consumer end points) quarterly;
- Bottle water companies, monthly.

Water quality testing is carried out in the MoH's own testing laboratory, with the SROS lab used for verification and testing bottle water companies.

A major constraint to the expansion of the monitoring program (eg increasing the frequency of sampling of IWSs and increasing the number of sample locations) has been the lack of MoH laboratory and staffing capacity. MoH intends to address this during the tenure of the current Sector Plan through upgrading of laboratory facilities, training and capacity building. Some constraints are listed below:

- Draft Water Safety Plans are required for Alaoa Treatment Plant, Malololelei Treatment Plant and for the four SWA rural packaged plants at Togitogiga, Tafitoala, Piu and Lepa
- Conclusion of discussion with Samoa Partnership Programs and Queensland Health on accreditation of water quality tests in view of cost
- Installation of treatment/chlorination facilities for the remaining untreated SWA boreholes
- Improved compliance levels for SWA and IWS systems at all stages of the water supply chain; from the catchment to end consumer.

3.7.2 Health Surveillance

Staffing limitations have resulting in the temporary cessation of regular health surveillance reporting by the MoH. From June 2016 onwards, the MoH will resume regular health surveillance reporting for the sector with the issuance of monthly bulletins on the status of water-borne diseases.

The link between water quality, sanitation and health is fundamental to the sector strategy and to achieving the health outcomes and improved living standards for all Samoans. This is also the key reason for the involvement of the MoH as a key partner in the sector. The health surveillance reports contribute to sector understanding, provide a rational basis for sector interventions and a measure of overall impact and effectiveness of the interventions.

3.7.3 Water Safety Plans

Samoa identified Water Safety Planning as one of the initiatives under their Health Sector Plan 2008-2018 as well as the current *Water for Life* Water Sector Plan and Framework for Action.

Water Safety Plans (WSPs) are defined in the third edition of the WHO Guidelines for Drinking Water Quality (2004) as:*'A comprehensive risk assessment and risk management approach that encompasses all steps in the water supply from catchment to consumer to consistently ensure the safety of water supplies'*

The MoH's role is to ensure that all water service providers must have approved WSPs in place for all systems.The MoH, Health Surveillance and International Regulation Division has overall responsibility for the oversight of WSPs prepared by SWA and IWSA. Tasks undertaken include:

- Conducting annual audits of WSPs
- Monitoring implementation of WSPs
- Conducting training to upgrade staff skills in preparation and auditing of WSPs

This is an ongoing activity of MoH. For many of the SWA and IWS systems WSPs are still under preparation, with many scheduled for completion during the tenure of this Sector Plan. Oversight and auditing of WSPs will therefore present an increasing caseload in the coming years, and this will demand increased capacity on the part of the MoH.

3.7.4 SNDWS

An update of the Samoa National Drinking Water Standards (SNDWS) was undertaken in 2015. This represents the first major revision to the 2008 SNDWS. During the tenure of the Sector Plan the MoH will finalize the review of the SNDWS, which will lead to its implementation by relevant stakeholders.

Chapter 4: Sector Opportunities and Constraints

4.1 Overview

This section on 'Sector Opportunities and Constraints' has been updated from the previous Sector Plan[47] and incorporates:

- Sector progress (or lack of progress) and developments over the period of the previous Sector Plan (2012-2016) and lessons learned
- Findings from independent evaluations undertaken of the Sector Program
- Feedback from IAs and stakeholders
- The results of public consultation that took place in Upolu and Savaii, with communities and NGOs.

Although the Sector has made significant progress since the start of the reform process in 2005, particularly in areas of institutional and legal reforms, capacity building, monitoring and reporting on progress, the water sector in Samoa will continue to face the key challenges of security of funding to meet its planned outcomes, and a skills shortage that is affecting all sectors of the country. While progress is being made, new challenges emerge. Climate change is having a real and measurable impact in Samoa and the region. These and other opportunities and challenges are summarised below.

4.2 Major Opportunities

Commitment to Water Sector Reform

Since the start of the water sector reform process, in 2005, there has been a high level of commitment and support from the GoS which in turn has reinforced and complemented the support from donors such as the EU. The water sector has been identified as a national priority under the 'Strategy for Development of Samoa[48].

An independent evaluation[49] undertaken in 2013 found:

> "*The water sector is regarded as somewhat of a model by the GoS, which has adopted many of the processes and procedures developed (such as the 3-year MTEF, annual sector reports and review process etc.) for use in other sectors. The water sector, with its diverse range of stakeholders, is seen as having a distinct identity and acting effectively as a cohesive unit to achieve sector objectives".*

The progress and achievements of the Sector to date provides further opportunity and incentive for ongoing improvement, and encourages donor participation.

Appropriate Institutions with Policy and Legal Mandates

The transition to the EU-funded Sector Budget Support from June 2010 has required the sector IAs to take full responsibility for programme/ investment planning, budgeting and implementation using government policies and procedures. Institutional arrangements developed under the WaSSP have been mainstreamed into relevant organisational structures of concerned Ministries. As a result, the institutional and legislative framework is now at a relatively mature level and, with effective levels of review and oversight established. While the reform process will continue under this Sector Plan, most

47 From the Water for Life Sector Plan 2012-2016

48 'Strategy for Development of Samoa (SDS) 2008 – 2012'. The updated SDS also recognises the key role of the Sector in terms of climate change adaptation and vulnerability.

49 EC Delegation in Samoa - Final Evaluation - Water & Sanitation Sector Policy Support Programme, Final Report, October 2013

of the major reform agenda is essentially in place. This frees up resources to concentrate on enforcement and implementation.

Effective Monitoring and Coordination

The Sector exhibits a high level of coordination and cooperation which has been built over the many years of the Water Sector reform period. Practical day-to-day leadership of the sector is being effectively provided by the WSCU. A comprehensive capacity building plan for the Sector is to be developed in the current phase, which will strengthen the implementing agency's systems and staff capability to improve the quality of services and maintenance of infrastructure. The WSCU will need to strengthen the performance monitoring of key indicators. The Sector should continue to build alliances with development partners and stakeholders to further reinforce the sector wide programme approach and meet agreed targets.

Climate Change Financing

Samoa is highly vulnerable to the impact of climate change. Growing international donor support for climate related financing provides opportunities for the Sector to address increasing climate variability and subsequent impacts on water resources management, water supplies, sanitation, and drainage. Climate change also has a significant impact on health (refer Section 2.6). With the greater focus given to climate change under this Sector Plan, and IAs have factored in climate change impacts into their strategies and activities. The Sector is therefore well positioned to seek additional climate change financing, where available.

Vulnerable households

The EU-funded MDG Project[50]was a sector initiative (under the 2012-2016 Water for Life Sector Plan) that provided 1,200 vulnerable households with rainwater tanks and VIP latrines. The MDG Project reinforced the Sector's commitment to vulnerable households and to achieving its MDG targets by improving access to water and sanitation service to all. The MDG Project also provided the Sector, specifically the implementing partners (the SRC and the CSSP) with valuable experience and expertise in basic water supply and sanitation service delivery and in community participatory engagement. The SRC is now ideally placed to be the bridge between the Sector and the community in programme delivery in these areas.

Quality of Plumbing

The Sector through its partnership with the PAS has raised the standard of household plumbing through the training and licensing of plumbers, the establishment and adoption of improved plumbing standards and guidelines, and through raising the profile of licensed plumbers nationally. PAS is now well-positioned to enforce the PAS Act 2014 and Regulation along with the new National Building Code 2016 and to take a leading role in the monitoring of the quality of plumbing at the household level.

Collaboration between SWA and IWSA

The challenges facing the provision of improved and clean water supplies to the rural villages throughout Samoa require constructive collaboration between SWA and independent village water schemes (IWSs). There is now an accepted framework for promoting a more collaborative approach to rural water supplies through effective dialogue between IWSA, MWCSD and SWA with an MOU in

50Refer Section 3.4.8

place. The complementarity of services between the two service providers can be reinforced by exploiting synergies where possible, and seeking the harmonisation of tariffs. Under the MOU, the Sector can look for opportunities to support and strengthen the IWSA and improve the sustainability of the IWSs.

Partnerships between Water Sector stakeholders

The Water Sector has successfully developed, and continues to strengthen, partnerships between water sector, public communities and all relevant parties e.g. NGOs. Partnerships formed provide opportunities for future projects and programs and donor engagement. Communities have been engaged and enrolled as Sector agents, and this auger well for community ownership of facilities and longer term sustainability.

4.3 Major Constraints

Capacity of Sector Implementing Agencies

Sector capacity has long been recognised as a major challenge for the water sector, and indeed across all sectors in Samoa. Sector agencies continue to compete with other industries to recruit and retain skilled human resources. The Sector suffers from: high rates of staff turnover; limited number of engineers within Samoa; ambitious targets and activities versus limited resources; need for improved coordination and collaboration between subsectors.

Capacity gaps due to unfilled posts and lack of experienced staff can impact the implementation of the planned programs and therefore result in non-achievement of Sector outcomes. Private sector partnerships for contracting out selected services have assisted the Sector in the past and should be encouraged where appropriate.

Watershed Management and Conservation

Effective watershed management is critical to safeguarding water resources and a key element in combating the impact of climate change. Some progress has been achieved but increased effort is required. Engaging the communities in watershed management is critical to achieving conservation aims and this requires a participatory approach. Land ownership also remains an important issue and challenge, leading to GoS taking strategic steps in establishing the proper framework for regulating developments, and by zoning and securing critical watershed areas to be conserved. The development, implementation and monitoring of WMPs is a key intervention that needs to be properly financed by the Sector. The compensation of communities that are impacted by WMPs needs to be factored in.

Water Resources Monitoring

The WRD's national hydrometric network needs to be further expanded and sustained to allow the WRD to effectively monitor the impacts of climate change on water resources, including the status of aquifers and the risk and impact of saline intrusion on groundwater quality. The WRD will need to further develop its capacity water resources modelling and monitoring.

Sector financing

Sector budget allocations may be inadequate. Inconsistency and delays in the release of funds resulting in reduction in the scale, and delay of programmes. Furthermore, external project funding, which currently constitutes a sizeable portion of anticipated expenditure, may be reduced or could become so unpredictable that program-based Sector planning may be hampered.

Non-Revenue Water

One of the most important challenges facing the SWA continues to be the high level of NRW, mainly due to: leakage from aging pipe networks; illegal connections; un-metered properties and un-registered customers, and; an out of date customer data base. Although this has been prioritised by SWA and is being addressed, the solutions are long term and will require continued focus and adequate financing. In the year 2014-15, the level of NRW in: Upolu urban areas averaged 64%; Upolu rural areas averaged 62%, and; in Savaii averaged 70%. The long term target of SWA is to reduce NRW to 35%

Strengthening IWSA

For IWSA, staffing and capacity remains an ongoing challenge. In particular, IWSA lacks in-house technical capacity which has to date been provided on a more or less continuous basis through the services of a volunteer engineer (from Australia or NZ). With the completion of the rehabilitation of the IWSs, the focus of IWSA will shift from contract management and tendering to monitoring of IWSs, improving standards of operation and maintenance, coordinating a standardised tariff and collections approach, implementing the household water treatment strategy, etc. Training of IWSA staff will be required to prepare them for the new roles and scope of activities.

Data Availability and Sharing

Currently the Sector collates data across all the IAs and publishes performance data on a quarterly and annual basis, with the data made available to all stakeholders. However, the release of data from IAs in the past has, at times, been rather slow and this has reduced the impact and effectiveness of the performance monitoring. More needs to be done to ensure the timely availability of data if managers and decision-makers are to proactively manage resources effectively, and take effective action to deal with problems arising. Additionally, to add value to the data collected, more rigorous data analysis and interpretation is required so that important lessons can be derived from the data collected. A challenge for the sector is to establish within the WSCU an effective performance monitoring system that achieves these aims.

Quality and maintenance of Septic Tanks

According to the 2011 census there are 26,100 on-site sanitation facilities nationally, 82% of these are septic tanks (STs). The majority of STs are thought to be of older designs, many without ground slabs, and so discharge directly to the water table. Although there is no data on groundwater quality, the impact of STs on groundwater quality is thought to be significant and a potential health hazard. Recent surveys have indicated that the majority of STs (approx 80% nationally) are never pumped out, further reinforcing the notion that the tanks are in poor condition (high leakage, or not contained with floor slabs). Some recent efforts have been made to improve standards of STs with the introduction and enforcement of new ST building codes. An ADB funded project has installed more than 100 plastic septic tanks with soakpits for families in the Apia low lying area. More needs to be done to improve the quality of STs built, and their operation. A challenge for the sector is to pilot and implement improved and affordable ST systems that will achieve higher effluent quality standards to reduce the pollution risks within the Apia catchment.

Hygiene Awareness Campaigns

While good progress has been achieved in providing the population with improved access to water and sanitation services (refer Section 3.1.1) the evidence from the Baseline WASH Survey indicates that levels of hygiene awareness and practice are still lacking amongst the population (refer Section 3.5.4). The data indicates that hygiene awareness will need greater focus in order to maximise the potential health benefits from the improved water and sanitation services already delivered. There is scope for new and more innovative awareness campaigns to be developed to cut through to the target population groups. There is a further need to strengthen nationwide education and awareness campaign on promoting WfL issues specifically on sanitation and hygiene.

Climate Change

Samoa is exposed and vulnerable to the effects of global warming. Climate modelling suggests changes of climate will increase the frequency of natural disasters, with substantial economic consequences for the economy, as well as health and livelihood consequences for effected communities. Levels of disaster preparedness and risk reduction have improved in recent years, however much more preparation is required to mitigate the impacts of climate change and disasters and associated damage to infrastructure, which can potentially reduce or delay Sector Plan outcomes.

Chapter 5: Sector Outcomes

5.1 Overall Sector Goal

"Reliable, clean, affordable water and improved sanitation within the framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty".

5.2 Sector Development Principles

The Sector will be guided by the following key principles adapted from the Dublin Principles in the pursuit of its goal and developments:

Principle No.1– Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment;
Principle No.2 – Water and sanitation development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels;
Principle No.3 – Women play a central part in the provision, management and safeguarding of water and sanitation practices;
Principle No.4 – Water has an economic value in all its competing uses and should be recognised as an economic good;
Principle No.5- Close collaboration and partnership with stakeholders and relevant partners is vital for effective implementation of services.

5.3 End of SectorPlan Outcomes

This edition of the Water for Life Sector Plan uses the Outcomes Mapping approach, as defined in the Samoa Monitoring Evaluation Reporting Framework (SMERF) manual[51].Use of the Outcomes Mapping approach in the formulation of the Sector Plan harmonises/aligns the water sector with other sectors in Samoa, facilitates sector monitoring and evaluation and is consistent with GoS preferred approach.

The Sector Goal is defined as "Reliable, clean, affordable water and improved sanitation within the framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty". In order to realise the Sector Goal, the following End of Sector Plan Outcomes[52]are proposed for the next four years of implementation:

1. **Strengthened sector governance** to guide and sustain sector developments;
2. **Enhanced water resources resilience from Ridge to Reef;**
3. Increased access and improved provision of reliable, clean and affordable **water supply**;
4. Surveillance of **drinking water quality** and **water-borne diseases** improved
5. Increased access to improved basic **sanitation, wastewater management systems and promote hygiene practises**, through accessibility to all available sanitation information
6. Strengthened **flood mitigation measures** to reduce incidence and magnitude of flooding in the CBD.

51 Samoa Monitoring Evaluation Reporting Framework Manual for Sector Planning, Ministry of Finance, Economic Policy and Planning Division, August 2015.

52These six outcomes derive from the SDS 2012-16, and are referred therein as the 'Strategic Areas' for Sustainable Access to Safe Drinking Water and Basic Sanitation. In previous versions of the Water for Life Sector Plan, these six outcomes were referred to as Sector 'objectives'. The terminology used in this Sector Plan derives from the outcomes mapping approach, as advocated by SMERF.

5.4 Sub Sector Outcomes Maps

The SMERF uses the concept of Outcomes Mapping as a monitoring and evaluation approach to describe and define the project or program logic as follows: -

Goal ➡ End of SP Outcomes

➡ Intermediate Development Outcomes

➡ Outputs/Activities/Inputs

The End of SP Outcomes are the outcomes that are realistically expected to be achieved in the life of the Sector Plan, as a result of interventions.

Intermediate Development Outcomes are the 'steps along the way' to achievement of 'end of SP' outcomes.

Outputs are specific achievements or deliverables resulting from an activity; activities are the significant tasks that are undertaken to achieve the Sector Plan, and; inputs are the resources used (human resources, funds, materials, intellectual property etc).

Using the above approach, Outcomes Maps (OMs) have been developed for each of the six sub sectors (covering the above six sector outcomes defined in Section 5.3).

The OMs list the hierarchy of outcomes, outputs, activities and inputs required to realise the End of Sector Plan Outcome, and the longer term outcome (or goal).

The Performance Matrix for each sub sector establishes the core performance questions and associated indicators to enable sub sector progress and performance to be monitored in terms of the attainment of outcomes.

The Outcomes Map and accompanying Performance Matrix will therefore act as an 'outcomes' based reporting framework for the Sector Plan.

5.4.1 Governance

The Governance sub sector has identified the following Intermediate Outcomes to achieve the End of SP Outcome 1 of **"*Sector Governance and Orientation Strengthened*":**

1.1 Strengthened Sector Governance and Orientation through enhanced sector policy, strategy and planning frameworks

1.2 Enhanced and sustainable financial mechanisms for sector investments

1.3 Effective sector coordination mechanisms maintained

1.4 Effective and robust performance monitoring systems operationalised and maintained

1.5 Improved sector communication

1.6 Improved sector disaster preparedness and management

The Governance Outcomes Map in Table 16 lists in full the hierarchy of outcomes as well as the outputs, activities and inputs required to realise the Sector Plan Outcome.

The Performance Framework for the Governance sub sector (Table 17) establishes the core performance questions and associated indicators to enable sub sector progress and performance to be monitored in terms of the attainment of the *Intermediate* and *End of SP Outcomes*.

Table 16: Governance - Outcomes Map

SDS KPO 9	**Access to Clean Water and Sanitation Sustained**											
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.**											
ESPO 1	**Sector Governance and Orientation Strengthened**											
Intermediate Development Outcomes	1.1 Strengthened Sector Governance and Orientation through enhanced sector policy, strategy and planning frameworks		1.2 Enhanced and sustainable financial mechanisms for sector investments		1.3 Effective sector coordination mechanisms maintained	1.4 Effective and robust performance monitoring systems operationalised and maintained			1.5 Improved sector communication		1.6 Improved sector disaster preparedness and management	
Outputs	Water for Life Sector Plan 2016-2020	Updated National Water Services Policy	Updated MTEF	Updated Investment plans	Number of Meetings	Sector Annual Review and Forum events	Published Sector Annual Review Reports	Independent Biennial Review Reports	Sector Communication Strategy	Updated Sector Webpage	Updated Sector Disaster Management Plan and Operations Manual	DRM Scorecards
	Updated Sector Capacity Building Action Plan	Updated and endorsed MoU between SWA and IWSA	Disbursement Requests		Meeting Minutes and Reports	Updated PMS	Published Water and Sanitation Journal		Quarterly Newsletter issues		IA Trainings on DRM conducted with reports developed	Disaster Simulation Exercise conducted biennially
Activities	1.1.1 Review and implement a practical and coherent Sector framework for action 2016-2020		1.2.1 Annual review and update sector MTEF		1.3.1 Coordinate meetings of the high level Ministerial Coordination Committee (MCC) as required from time to time	1.4.1 Collect performance data on a quarterly basis from IAs			1.5.1 Coordinate implementation of a Sector Communication Strategy		1.6.1 Strengthen collaboration with the Disaster Management Division	
	1.1.2 Review and implement of the National Water Services Policy		1.2.2 Mid-term review of the approved annual budget		1.3.2 Coordinate quarterly Joint Water Sector Steering Committee (JWSSC) meetings	1.4.2 Issue quarterly reports on sector's progress towards achieving performance indicators to the JWSSC and MCC			1.5.2 Upgrade and improve quality of sector webpage in the MNRE website		1.6.2 Review and implement the sector preparedness and response plans and operations manual	
	1.1.3 Review and Implement the MOU between SWA and IWSA		1.2.3 Review and update long term investment plan for the sector		1.3.3 Undertake monthly Technical Steering Committee (TSC) meetings to monitor subsector progress and developments	1.4.3 Undertake Joint Water and Sanitation Sector Annual Reviews			1.5.3 Prepare and disseminate quarterly sector newsletters to all stakeholders including local communities		1.6.3 Conduct Disaster Risk Management Trainings for IAs based on the Sector Preparedness and Response Plans and Operations Manual	
	1.1.4 Review and Implement the Sector Capacity Building Action Plan 2017-2020		1.2.4 Consolidate and submit the Disbursment Request Report to EU		1.3.4 Ensure regular sub-sector committee meetings (bi-monthy/monthly) are held to coordinate programme implementation	1.4.4 Conduct Bi-annual Reviews of implementation progress of the WfL Sector Plan			1.5.4 Set up an information resource centre for key reports/documents in soft and hard copies		1.6.4 Conduct bi-annual drills to prepare and familiarise Ias with expected coordination roles during an actual natural disaster	
	1.1.5 Follow up National Water, Sanitation and Hygiene Survey		1.2.5 Strengthen engagement with Development Partners			1.4.5 Implement evidence-based research to inform sector policy planning and to gauge external feedback on sector developments						
	1.1.6 Facilitate integration of National Water and Sanitation Survey into the National Census undertaken every 5 years					1.4.6 Publish Water & Sanitation Research /National Water Forum						
Inputs	Subsector IA technical and financial reports		Sector and IA Investment Plans	Sector Budget Proposals	Subsector IA technical and financial reports	Sector Ias/ Subsector Annual Review Reports	Research Papers endorsed by PRC	TORs for Tas	Subsector Ias articles	Webpage updates	TORs for Tas	DMOs input
Getting started	Donor confirmation of funds											
	Subsector Memorandum of Understanding											
	Required Technical Assistance											
	Capacity Building Programmes											

Table 17: Governance Performance Matrix

End of Sector Plan Outcome (ESPO) 1	Performance Questions	Intermediate Outcomes	Indicators	Methodology - Data Collection	Unit	Baseline FY 15/16	TARGETS				Means of Verification	Responsible IAs	Timing Data Collection
							FY 16/17	FY 17/18	FY18/ 19	FY19/ 20			
1) Sector Governance and Orientation Strengthened	Has Sector Governance and Orientation being strengthened through enhanced sector policy and planning frameworks?	1.1 Strengthened Sector Governance and Orientation through enhanced sector policy, strategy and planning frameworks	Implementation of the updated WfL Sector Plan 2016-2020	% of implementation of the updated WfL Sector Plan 2016-2020	Cum %	Draft Sector Plan 2016-2020	25%	50%	75%	100%	Sector Annual Review Reports	All IA's	Annually
			Updated National Water Services Policy	Review and Update of the National Water Services Policy	Policy	National Water Services Policy 2010		X			Updated National Water Services Policy	All IA's	Completed by end of FY17/18
			Sector Capacity Building Plan updated and implemented	Review and Update of the Sector Capacity Action Building Plan	CBAP	3 year Capacity Building Action plan 2013		X			Updated Sector Capacity Building Action Plan	All IA's	Completed by end of FY17/18
			MoU between SWA and IWSA endorsed and implemented	Review and update the MoU between SWA and IWSA and endorsed	MOU % Impl.	draft MoU	X	25%	50%	75%	Final and endorsed MoU	MNRE-WSCU, SWA, IWSA	Completed by end of FY16/17
	Is sustainable financial mechanisms for sector investments enhanced?	1.2 Enhanced and sustainable financial mechanisms for sector	Updated sector MTEF report (on annual basis)	Update the sector MTEF in line with approved annual budgets	MTEF Report	MTEF 2015-2020	MTEF 2016-2020	MTEF 2017-2020	MTEF 2018-2020	MTEF 2019-2020	Updated MTEF	MNRE-WSCU	Annually

	investments	Disbursement Request for EU developed and submitted on time	Develop and submit the Disbursement Request Report to EU Office	Report	DR Report FY14/15	X	X	X	X	Disbursement Request Report, Confirmation of receipt by EU, Disbursement of requested funds	MNRE-WSCU	Annually
		Investment plans updated in line with budget estimations	Update the Investment Plan and Budget Estimations	Plan	Investment Plan 15-25	IP 16-26	IP 17-27	IP 18-28	IP 19-29	Updated Investment Plans	All IA's	Annually
Are effective Sector Coordination mechanisms maintained?	1.3 Effective sector coordination mechanisms maintained	Regularity of JWWSC, TSC and Subsector meetings	Number of sector meetings held per year	No pa	44	50	50	50	50	Meeting Minutes and Reports	All IA's	Monthly, Bimonthly, Quarterly
Is the Performance Monitoring System operationalized and maintained?	1.4 Effective and robust performance monitoring systems operationalised and maintained	Sector Performance Review	Conduct annual sector performance reviews	Annual Review Event	8th	9th	10th	11th	12th	Annual Review Reports and Minutes	All IA's	Annually
			Publish annual sector reports	Published Report	7th AR Report Published	8th	9th	10th	11th	Review Published Reports	All IA's	Annually
		Performance Monitoring System updated monthly	Update the Sector's Performance Monitoring System	Monthly updates		X	X	X	X	Updated PMS	MNRE-WSCU	Annually
		Research Initiative programs	Conduct Annual Water and Sanitation	Forum Event	5th Forum	6th	7th	8th	9th	Final Research Papers	All IA's	Annually

		conducted	Forms							endorsed by PRC		
			Consolidate Research Papers and Publish the Journal	Journal Edition	2nd	3rd	4th	5th	6th	Published Journal	MNRE-WSCU	Annually
		Independent Biennial Review of WfL Sector Plan conducted	Conduct an Independent Review of the sector every two years in accordance to the sector strategy	Evaluation Report	Independent Bi-ennial Report 12/13 and 13/14		14/15 & 15/16	16/17 & 17/18		Final Biennial Review reports	MNRE-WSCU	Biannually
Is the Sector Communication mechanism improved?	1.5 Improved sector communication	Implementation of the Sector Communication Strategy	Implementation progress of the Sector Communication Strategy	Cum % Impl.	Communication Strategy completed	25%	50%	75%	100%	Implementation reports	MNRE-WSCU	Annually
		Sector Webpage updated	Upgrade of the Sector Webpage	Upgraded webpage	MNRE Website Underconstruction		X	X	X	Webpage updates	MNRE-WSCU	Annually
		Issue of Quarterly Newsletters	Number of Quarterly Newsletters issued	No pa	4	4	4	4	4	Final Quarterly newsletters	MNRE-WSCU	Quarterly
Is the Sector Disaster Risk Management being improved?	1.6 Improved sector disaster risk management	Sector Disaster Management Plan reviewed and updated	Review and update of the Sector Disaster Response Plan and Operations Manual	Plan	Sector DM Plan 2013		X			Updated Sector Disaster Management Plan and Operations Manual	All Ias	Completed by end of FY17/18

			IA Trainings on Disaster Risk Management conducted	Number of IA trainings conducted on Disaster Risk Management	No pa	nil	1	1	2	2	Training Reports	All Ias	Annually
			Disaster Response Simulation conducted	Number of Disaster Simulation Exervise conducted for the Sector	No	nil		1		1	Training Reports	All IA's	Biannually

5.4.2 Water Resource Management

The Water Resource Management sub sector has identified following five Intermediate Outcomes to achieve the End of SP Outcome 2 of **"*enhanced water resources resilience from Ridge to Reef*":**

2.1 Strengthened watershed conservation and management

2.2 Improved knowledge and understanding of water resources

2.3 Strengthened legal and policy frameworks for water resources management

2.4 Robust and sustainable Stakeholders Partnership

2.5 Community skills and confidence built

The Water Resource Management Outcomes Map in Table 18 lists in full the hierarchy of outcomes as well as the outputs, activities and inputs required to realise the Sector Plan Outcome.

The Performance Framework for the Water Resource Management sub sector (Table 19) establishes the core performance questions and associated indicators to enable sub sector progress and performance to be monitored in terms of the attainment of the *Intermediate* and *End of SP Outcomes*.

Table 18: Water Resources Management Outcomes Map

SDS KPO 9	**Access to Clean Water and Sanitation Sustained**									
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the framework of Integrated Water Resources Management for a resilient Samoa, sustaining health and alleviating poverty**									
ESPO 2	**Enhanced water resources resilience from Ridge to Reef**									
Intermediate Development Outcomes	2.1 Strengthened watershed conservation and management		2.2 Improved knowledge and understanding of water resources		2.3 Strengthened legal and policy frameworks for water resources management		2.4 Robust and sustainable Stakeholders Partnership		2.5 Community skills and confidence built	
Outputs	Water shed Mangement Plans developed and implemented	Prioritised Areas rehabilitated and declared reserves	Updated ground potentiometric maps	Number of boreholes monitored	Water Abstractions licenses issued	Village bylaws developed for prioritised communities	Community Conservation sites established	MoUs established with communities and stakeholders	Consultations with communities and stakeholders	
	P3D Models develeped with prioritied communities		Number of telemetry stations installed and operational	Capacity building programs conducted for the WRM Subsector						
Activities	2.1.1 Formulate, implement and enforce watershed management plans and regulatory tools in key watershed areas sustaining water supplies;		2.2.1 Expand and Maintain the National Hydrometric Network (Surface and groundwater)		2.3.1 Implement and enforce the National Water Resources Policy, Water Resource Management Act, regulations and village bylaws.		2.4.1 Develop new partnerships with NGOs/CSOs (MoU)		2.5.1 Develop a pilot for Payments for Ecosystem Services in relevant watershed areas	
	2.1.2 Develop P3D models as a tool for implementation of Watershed Management Plans		2.2.2 Upgrade National Hydrometric network and communication capability and information management systems (Telemetry)		2.3.2 Review and implement the National Water Resources Master Plan				2.5.2 Conduct effective awareness and educational programmes	
	2.1.3 Establish critical watershed areas as reserves (community reserves, compensated land, demarcation etc.)		2.2.3 Improve water related hazard (flood/ drought) monitoring and information to inform warning and adaptation.		2.3.3 Ongoing administration of the Water Abstraction Licensing Scheme				2.5.3 Promote and strengthen community driven watershed conservation and rehabilitation	
	2.1.4 Rehabilitate riparian areas using both hard (river walls, fencing) and soft (replanting, bio-log filter) solutions		2.2.4 Strengthen water resource quality monitoring		2.3.4 Provide secretariat functions to the Water Resources Technical Committee and Water Resources Management Board;					
	2.1.5 Improve and expand parameters (biological, chemical, ecological) of the River Ecosystem Health Monitoring Program (REHM)		2.2.5 Data analysis and reporting on surface and ground water information (Hydrometric map, surface flow, groundwater profiling etc.)		2.3.5 Ongoing monitoring and evaluation of policies and plans					
			2.2.6 Develop Water Environmental Guidelines							
			2.2.7 Address capacity building needs for water resources in policy, hydrology and watershed management (Twinning arrangement, Training needs)							
Inputs	MoU with communities	Adequate Staff and their relevant capability	Physical and Human Resources	Baseline information and data	MoUs with stakeholders/ communities	Inforation/ Data	MoUs with stakeholders/ communities		Physical and Human Resources	Staff Capabiity
Getting started	Donor confirmation of funds									
	Subsector Memorandum of Understanding									
	Required Technical Assistance									
	Capacity Building Programmes									

Table 19: Water Resources Management Performance Matrix

End of Sector Plan Outcome 2	Key Performance Questions	Intermediate Outcomes	Key Performance Indicators	Methodology	Unit	Baseline FY15/16	TARGETS				Means of Verification	Responsible Ias	Timing Data Collection
							FY16/17	FY17/18	FY18/9	FY19/20			
2) Enhanced water resources Resilience from Ridge to Reef	**Has watershed management and water resource reliabilty improved?**	***2.1 Strengthened watershed conservation and management***	Watershed Management Plans	No. Of Watershed Management Plans developed	Cumulative No.	15	17	19	21	23	Watershed Management Plans endorsed by JWSSC and CDC	MNRE (WRD)	Annually
			Status of Implementation of Watershed Management Plans	Percentage of Implementation of Approved Watershed Management Plans	Cumulative %	40%	45%	50%	55%	60%	Audit of Watershed Management Plans	MNRE (WRD)	Annually
	Have watershed catchment areas been rehabilitated?		Prioritised Areas rehabilitated and declared reserves	Cumulative Total Hectares of prioritized watershed areas rehabilitated and/or declared reserves	hectares pa	323	20	20	20	20	Field Reports/ Wateshed database/ Minutes of Monthly subsector Meetings/ Maps of rehabilitated areas produced on annual basis	MNRE (WRD)	Annually
	Has the hydrometric database been updated?	***2.2 Improved knowledge and understanding of water resources***	Ground potentiometric map	Percentage of ground potentiometric mapping	% pa	20%	2%	2%	2%	2%	Borehole monitoring reports	MNRE (WRD)	Annually
			Groundwater monitoring network expansion	No of Boreholes monitored per year	No. Pa	22	2	2	2	2	Groundwater drilling reports, Subsector (WRM) technical reports	MNRE (WRD)	Annually
			Telemetry System expansion	No of telemetry stations installed and operational per year	No. pa	26	26	2	2	2	Telemetry systems installed reports	MNRE (WRD)	Annually
	Has the RHEM Program been improved?		RHEM coverage expansion	No of scorecards per year for RHEM Coverage	No. pa	2	1	1	1	1	Monitoring reports, notice issued to offenders, Subsector (WRM) Technical Reports	MNRE (WRD)	Annually
	Has the legal framework been strengthened	***2.3 Strengthened legal and policy frameworks for water resources management***	Abstraction licenses	No of Licenses issued per year	No. pa	34	6	6	6	6	Issued licenses confirmation	MNRE (WRD)	Annually
			Village bylaws	No of village bylaws developed	No. pa	6	2	2	2	2	Village by-laws approved by village & communities	MNRE (WRD)	Annually
	Has partnership been strengthened?	***2.4 Robust and sustainable Stakeholders Partnership***	Community conservation areas establlished within critical watershed areas	No of community conservation sites established per year	No. Pa	1	1	1	1	1	Pilot evaluation reports	MNRE (WRD)	Annually
			MoU with communities and stakeholders	No of MoUs with stakeholders (including communities etc) endorsed and implemented	No. pa	4	1	1	1	1	MOUs endorsed and implemented	MNRE (WRD)	Annually
	Are communities sufficiently consulted on all aspects of watershed management planning and village bylaws?	***2.5 Community skills and confidence built***	Villages communities, stakeholders and schools consultations	No of consultations conducted with villages, communities and schools per year	No. pa	30	6	6	6	6	Watershed management plans finalised by Subsector (WRM) Technical Committee	MNRE (WRD)	Annually

5.4.3 Water Supply

The Water Supply subsector has identified the following Intermediate Outcomes aimed at achieving the End of Sector Plan Outcome 3 of *"**Increased access and improved provision of reliable, clean and affordable water supply**"* to all people living in Samoa:

3.1: Water supply coverage increased

3.2 Non Revenue Water reduced

3.3 Drinking Water Quality Improved

3.4 Financial Sustainability enhanced

3.5 Customer / Community satisfaction and knowledge increased

3.6 Organisational capacity enhanced with staff knowledge and skills built and improved office facilities

3.7 Rainwater harvesting promoted and implemented for the most vulnerable households

3.8 Quality of Plumbing Services improved

Most of the above outcomes apply to SWA as the prime agency for delivery of piped water supply services. In addition, other IAs such as IWS, PAS and SRCS within the Water Supply Subsector are responsible for the other outcomes. These outputs will further progress SWA's priorities areas for strengthening service delivery, reducing NRW, improving water quality and improving asset management and maintenance as well as financial management. In addition, SWA will continue to build the capacity of its staff and to have effective dialogue with its customers through community consultation.

The SWA intends to increase water supply coverage through the ongoing completion of water scheme extensions, construction of planned new water schemes, and the development of new water sources for drought proofing. Improved water quality for SWA customers will be achieved by the: phased upgrading of chlorination facilities at Rural and Urban WTPs; construction of new facilities where they currently do not exist, and; implementation of Drinking Water Safety Plans.

Some of the above listed Intermediate Outcomes will also apply to the IWS schemes. Upgrades of further IWS schemes will take place, improving water service levels. Measures to improve water quality of the untreated IWSs include: increased implementation and monitoring of Drinking Water Safety Plans; improved water quality monitoring using a tiered water quality scale; community managed catchment protection and maintenance, and introduction of household level water treatment measures.

The Water Supply Outcomes Map in Table 20 lists the hierarchy of outcomes as well as the outputs, activities and inputs required to realise the Sector Plan Outcome.

The Performance Framework for the Water Supply sub sector (Table 21) establishes the core performance questions and associated indicators to enable sub sector progress and performance to be monitored in terms of the attainment of the *Intermediate* and *End of SP Outcomes*.

Table 20: Water Supply Outcomes Map

SDS KPO9	**Access to Clean Water and Sanitation Sustained**							
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.**							
ESPO 3	**"Increased access and improved provision of reliable, clean and affordable water supply"**							
Intermediate Development Outcomes	3.1: Water supply coverage increased	3.2 Non Revenue Water reduced	3.3 Drinking Water Quality Improved	3.4 Financial Sustainability enhanced	3.5 Customer / Community satisfaction and knowledge increased	3.6 Organisational capacity enhanced with staff knowledge and skills built and improved office facilities	3.7 Rainwater harvesting promoted and implemented for the most vulnerable households	3.8 Quality of Plumbing Services improved
Outputs	Water supply coverage for SWA increased	Reduced NRW levels for SWA's Service areas within the AUA	Water Quality compliance standards (endpoints and boreholes) met by SWA and IWS as per NDWS	Billing and Collection Efficiencies by SWA	Customer complaints resolved	Capacity Building Programs attended by SWA	Rainwater harvesting measures for most vulnerable families	Registered and Certified plumbers increased
	Upgraded IWS schemes		Water Safety Plans developed			Capacity Building Programs attended by IWS		
Activities	3.1.1 Construct SE Upolu Regional WS	3.2.1 Comprehensive pipe network improvements and pipe replacement program to reduce NRW	3.3.1 Improvement of chlorination facilities at Rural and Urban rapid sand WTPs	3.4.1. Review and implementation of WS tariff structure and levels, fees and charges	3.5.1. Improve Call Centre data collection, communication and reporting	3.6.1 Rehabilitation of Vaitele Compound and office facilities with the establishment of new SWA headquarters	3.7.1 Rainwater harvesting promoted as a climate change adaptation method for most vulnerable areas.	3.8.1 Enforce the PAS Regulation 2016 by registration of all active plumbers
	3.1.2. Construct Manono WS	3.2.2. Meter installation, replacement and relocation program including additional submains	3.3.2. Phased establishment of chlorination facilities at all remaining SWA borehole sources	3.4.2. Update of Asset Register and re-evaluation of all system and non-system assets	3.5.2 Increase awareness of issues and concerns through media coverage	3.6.2 Implement capacity building and twinning arrangements to enhance SWA/ IWSA Operational performance	3.7.2 Identify and assess households that are reliant on rainwater harvesting as their primary source of water	3.8.2 Qualified service providers certified and licensed in line with approved plumbing standards/guidelines
	3.1.3. Construct piped networks for Vailele and Aleisa service areas	3.2.3. Further NRW reduction programs for Savaii, Rural and Urban Schemes with major emphasis placed on leak detection and pressure management	3.3.3. Rehabilitate roughing and slow sand filters at all WTPs	3.4.3. Improve billing systems and reduce level of non-payment/outstanding debtors	3.5.3. Implement awareness programs and activities at priority schools.	3.6.3. Procure operational equipment for increased performance	3.7.3 Conduct Monitoring & Evaluation of households targeted under the rainwater harvesting initiative	3.8.3 Implement plumbing standards
	3.1.4. Construct treatment facilities and new piped networks for untreated systems on Apia outskirts	3.2.4. Maintain up to date and accurate customer database with digitised customer location on GIS	3.3.4. Rehabilitate Malololelei, Alaoa, Fuluasou and Faleata WTPs including replacement of valves/fittings/fencing/building	3.4.4 Increase number of IWS collecting fees for maintenance on a regular basis	3.5.4. Establish closer relationship with village committees in collaboration with MWCSD to provide forum for awareness raising, consultation and understanding of community needs		3.7.4 Conduct annual training programs for improved hygiene linked to health	3.8.4 Improve quality of plumbing services
	3.1.5. Alternative source works for drought protection	3.2.5. Implementation of 'smart' water network technologies (SCADA, smart meters)	3.3.5. Prepare 11 SWA drinking water safety plans & 16 IWS water safety plans	3.4.5 Establishment of the Asset Management Registry for IWS	3.5.5 Enforce Water Schemes Act 2015			
	3.1.6. Construct Moamoa 2nd sub-division WS		3.3.6 Measure progress of IWS towards achieving NDWQS through the use of the tiered water quality scale		3.5.6 Increase communities capacity on Climate Resilience methods on climate proofing their water schemes.			
	3.1.7. Construct Faleasiu Uta WS to developing area							
	3.1.8. Extension of Mulifanua piped network							
	3.1.9 Upgrade of 10 Independent Water Schemes							
Inputs	Financial, Physical and Human Resources	Financial, Physical and Human Resources	Financial, Physical and Human Resources	Financial, Physical and Human Resources	Financial, Physical and Human Resources	Financial, Physical and Human Resources	Financial, Physical and Human Resources	Financial, Physical and Human Resources
Getting Started	Donor confirmation of funds							
	Subsector Memorandum of Understanding							
	Required Technical Assistance/ Contractors							
	Capacity Building Programmes							

Table 21: Water Supply Performance Matrix

End of Sector Plan Outcome 3	Key Performance Questions	Intermediate Outcomes	Key Performance Indicators	Methodology	Unit	Baseline 15/16	TARGETS				Means of Verification	Responsible IAs	Timing for Data Collection
							FY 16/17	FY 17/18	FY 18/19	FY 19/20			
3. Access to reliable, safe and sustainable water supply increased	Has access to water supply increased?	3.1: Water supply coverage increased	a) SWA Water supply Coverage	% of SWA Coverage for Samoa	Cumulative %	**82%**	83%	84%	85%	85%	National Water and Sanitation Survey, National Census reports	SWA	Annually
			b) IWS Water Supply Coverage	No. Of IWS Upgraded	Cumulative No.	**24**	27	30	32	34	National Water and Sanitation Survey, National Census reports	IWS	Annually
	Has the operational performance been enhanced?	3.2 Non Revenue Water reduced	Non Revenue Water (urban service areas)	water losses in Apia and Urban treated service areas (Malololelei, Alaoa and Fuluasou)	litres/connection/day	**3,150 litres/connection/day**	2,900	2,650	2,600	2,550	SWA non revenue data, production and consumption data	SWA	Monthly
	Has drinking water quality been improved through upgraded disinfection systems and implementation of water safety plans?	3.3 Drinking Water Quality improved	a) SWA Water Quality Compliance	% of water tests for total coliform and E.coli at the user level in SWA treated urban service areas complying with the SNDWS	%	**80%**	85%	90%	91%	92%	MOH monthly drinking water quality reports	SWA /MOH	Monthly
				Number of SWA boreholes with operational chlorination facilities	No pa	**13 boreholes**	+5	+5	+5	+5	SWA chlorination progress information	SWA	Annually
				Number of SWA water safety plans approved and implemented	No pa	**1**	+2	+2	+2	+4	Approved DWSPs	SWA	Annually
			b) IWS Water Quality Compliance	Number of IWS water safety plans approved and implemented	Cumulative No.	**10**	14	18	22	26	Approved DWSPs	IWS	Annually
				Number of IWS schemes with water quality tests of less than 10 e coli/ 100ml measured at the customer tap	%	**30%**	40	45	50	55	MOH monthly drinking water quality reports	IWS	Annually
				Number of Households with Filter treatments installed	Cumulative No	**nil**	5	10	15	20	IWS/ MWCSD monthly progress reports	IWS	Annually
	Has financial sustainability been enhanced?	3.4 Financial Sustainability enhanced	Billing Efficiency	% of all SWA customers billed	%	**95%**	96%	96%	97%	97%	SWA Audited Accounts/ financial statements/ water sales	SWA	Monthly
			Collection Efficiency (Domestic)	% domestic customer (payments received/water use billed)	%	**85%**	88%	90%	92%	94%		SWA	Monthly
			Collection Efficiency (All Customers)	% all customers (payments received/water use billed)	%	**90%**	92%	94%	95%	96%		SWA	Monthly
			Collection Efficiency (Wastewater)	% wastewater customers (payments received/wastewater billed)	%	**90%**	92%	94%	96%	97%		SWA	Monthly
	Has responsiveness to customer complaints improved?	3.5 Customer satisfaction increased	Responsiveness Index	% of SWA customer complaints resolved within target days	%	**85%**	78%	80%	82%	85%	SWA customer satisfaction surveys	SWA	Monthly
	Has Organisational capacity been enhanced?	3.6 Organisational capacity enhanced with staff knowledge and skills built and improved office facilities	a) Professional Development Programs for SWA staff in country and overseas	Number of capacity building programs attended by SWA staff in country and overseas	No. Per annum	**29**	5	5	5	5	SWA published annual reports	SWA	Annually
			b) Professional Development Programs for IWS committee and staff in country and overseas	Number of capacity building programs attended by IWS committee and staff in country and overseas	Cumulative No.	**2**	5	8	11	14	IWS monhly progress reports	IWS	Annually
	Have the most vulnerable households identified with no access to water supply been supported with rainwater harvesting tanks?	3.7 Rainwater harvesting promoted and implemented for the most vulnerable households	Most vulnerabble households identified having access to water supply through some rainwater harvesting measure	Number of of the most vulnerable households identified having access to water supply through some rainwater harvesting measure	Cumulative No. Of households	**1200**	1200	1300	1400	1500	Project completion reports/ contractors reports	SRCS/ WSCU	Annually
	Have the quality of plumbing services improved?	3.8 Quality of Plumbing Services improved	Increase in PAS membership	Number of Registered members for PAS	Cumulative No.	**nil**	40	50	60	70	PAS Official registration list	PAS	Annually
			Increase in Certified Plumbers Registered	Official list of certified plumbers who have registered	Cumulative No.	**nil**	4	14	24	34	PAS Official registration list	PAS	Annually

5.4.4 Drinking Water Quality

SixIntermediate Outcomes have been identified to achieve the End of SPoutcome 4 of "***Surveillance of drinking water quality and water-borne diseases improved"***. The Intermediate Outcomes relate to improved surveillance and reporting of drinking water quality and water-borne diseases, the enforcement of the legal provisions for drinking water quality and Drinking Water Safety Plans, capacity building and improved coordination and information sharing between key stakeholders through enhanced partnership arrangements, to build stakeholder confidence, and improvements to the MoH water testing laboratory facilities.

The Intermediate Outcomes are listed below

4.1 Improved drinking water quality surveillance

4.2 Improved monitoring and reporting of prevalence of water -borne diseases

4.3 Strengthened legal and policy frameworks for drinking water quality

4.4 Enhanced organisational capacity of MOH to improve monitoring of water quality and surveillance of water borne diseases.

4.5 Increased public awareness on water quality issues

4.6 Strengthened Stakeholder partnerships

The Drinking Water Quality Outcomes Map in Table 22 lists in full the hierarchy of outcomes as well as the outputs, activities and inputs required to realise the Sector Plan Outcome.

The Performance Framework for the Drinking Water Quality sub sector (Table 23) establishes the core performance questions and associated indicators to enable sub sector progress and performance to be monitored in terms of the attainment of the *Intermediate* and *End of SP Outcomes*.

Table 22: Drinking Water Quality Outcomes Map

SDS KPO 9	**Access to Clean Water Supply and Sanitation Sustained**						
Long Term Outcome	**Reliable, clean, affordable water and basic sanitation within a framework of Integrated Water Resources Management, for all people of Samoa to sustain health improvements and alleviate poverty**						
ESPO 4	**Surveillance of drinking water quality and water-borne diseases improved**						
Intermediate Development Outcome	4.1 Improved drinking water quality surveillance		4.2 Improved monitoring and reporting of prevalence of water - borne diseases	4.3 Strengthened legal and policy frameworks for drinking water quality	4.4 Enhanced organisational capacity of MOH toimprove monitoring of water quality and surveillance of water borne diseases.	4.5 Increased public awareness on water quality issues	4.6 Strengthened Stakeholder partnerships
Outputs	Water Quality Compliance Results reports for SWA, IWS and Bottling Water Companies	Audited WSPs	Updated Map (Prevalence of Water borne diseases)	Reviewed NDWS 2015	Refresher training programs on Water Safety Plan Auditing	Consultations and awareness /educational programs on water quality issues	Bi-monthly subsector meetings and relevant minutes and reports
	Water Quality tests conducted		Monthly Bulletins on disease surveillance (NCDs and water borne)	Foods Act 2015 implemented and enforced	Training on H-CLEWS		
Activities	4.1.1 Review and update the National Drinking Water Standards 2008		4.2.1 Regular collections and reporting of syndromic surveillance data on water borne diseases	4.3.1 Enforce all provisions of the updated National Drinking Water Standards	4.4.1 Upgrade the Water Quality Laboratory	4.5.1 Design and implement targeted awareness and educational programs on drinking water quality issues through media and other IEC materials	4.6.1 Strengthen coordination and information sharing between MOH, IWS, MNRE and MOH as per MOU
	4.1.2 Finalise and implement Guidelines for Updated Drinking Water Quality Standards.		4.2.2 Circulate monthly surveillance bulletins on water borne diseases to sector stakeholders	4.3.2 Enforce provisions of the Food Act 2015	4.4.2 Recruit qualified staff for drinking water monitoring and health surveillance	4.5.2 Conduct effective awareness programmes on the updated NDWS and Food Act 2015	4.6.2 Engage SWA, IWSA and MNRE continually through subsector committee bi-monthly meetings
	4.1.3 Monitor implementation of water safety plans		4.2.3 Circulate Alert Reports to relevant Authorities when diarrhoea and typhoid exceed threshold level		4.4.3 Upgrade knowledge and skills of staff on auditing water safety plans through trainings and professional development.		
	4.1.4 Ongoing Monitoring of water service providers		4.2.4 Map out prevalence of all water related diseases.		4.4.4 Upgrade public health officials knowledge and competencies on epidemiology		
	4.1.5 Conduct bi-annual audits of the water safety planning process		4.2.5 Procure the Water and Sanitation Mobile Truck for monitoring and testing.		4.4.5 Capacity building of staff on Health Climate Early Warning System (H-CLEWS) to detect water related outbreaks.		
	4.1.6 International accreditation of drinking water quality tests every 2 years						
	4.1.7 Formalise certification process for compliant bottled water companies.						
	4.1.8 Procure and install water treatment system for all health centres (urban and rural)						
Inputs	Financial, physical and human resources and human capital		Financial, physical and human resources and human capital	Financial, physical and human resources and human capital	Financial, physical and human resources and human capital	Financial, physical and human resources and human capital	Financial, physical and human resources and human capital
Getting started	Donor confirmation of funds						
	Subsector Memorandum of Understanding						
	Required Technical Assistance						
	Capacity Building Programmes						

Table 23: Drinking Water Quality Performance Matrix

End of Sector Plan Outcome 4	Perfomance Questions	Intermediate Outcomes	Key Performance Indicators	Methodology	Units	Baseline FY15/16	TARGETS				Means of Verification	Responsible Ias	Timing for Collection Data
							FY 16-17	FY 17-18	FY 18-19	FY 19-20			
4) Surveillance of drinking water quality and water- borne diseases improved	Has surveillance of drinking water quality improved?	4.1 Improved drinking water quality surveillance	Frequency of testing for SWA endpoints against SNDWS 2015	Number of Tests per year	No. Pa	12x	12x	12x	12x	12x	Sampling, testing and reporting	MoH	SWA WTP & Endpoints - Monthly
			Frequency of testing for SWA Treatment Plants against SNDWS 2015	Number of Tests per year	No. Pa	2x	2x	2x	2x	2x			SWA WTPs - 6 monthly
			Frequency of testing for SWA Boreholes against SNDWS 2015	Number of Tests per year	No. Pa	12x	12x	12x	12x	12x			SWA Boreholes - Quarterly
			Frequency of testing for IWS against SNDWS 2015	Number of Tests per year	No. Pa	4x	4x	4x	4x	4x			IWS schemes- Quarterly
			Frequency of testing for Registered Bottled Water Companies against SNDWS 2015	Number of Tests per year	No. Pa	12x	12x	12x	12x	12x			Bottling Water Companies - Monthly
			Effective monitoring and enforcement of Water Safety Plans	An audit to take place pa	No. Pa	10	x	x	x	x	Water safety planning audit report	MOH	Annually
	Has the monitoring and surveillance of the prevalence of water borne diseases improved?	4.2 Improved monitoring and reporting of prevalence of water borne disease	Prevanlence (incl. Geographical distribution) of water borne diseases in the country	Map	No of Maps updates produced	nil	1	2	2	2	Map of critical areas produced on a 6 monthly basis	MoH	6 monthly
			Timely circulation of bulletins on status of water borne- diseases	Number of monthly bulletins on status of water-borne diseases widely circulated	No. Of bulletins per year	12	12	12	12	12	Published bulletins	MOH	monthly
	Has staff capacity enhanced?	4.4 Enhanced organisational capacity of MOH	Refresher Training programs on Auditing of Water Safety plans	Number of training on auditing of water safety plans per year	No per year	2 WSP Audit Trainings conducted	1	1	1	1	Training reports	MoH	Annually
			Training on Health Climate Early Warning Systems (H-CLEWS)	Number of training on H-CLEWS	No per year	nil	1	1	1	1	Training reports	MOH	Annually
	Has public awareness programs on water quality issues increased?	4.5 Increased public awareness on water quality issues	Consultations on water quality issues including NDWS and Food Act 2015	Number of consultation conducted on water quality issues	No per year	1	≥1	≥1	≥1	≥1	Awareness program reports	MOH	Annually

5.4.5 Sanitation

The Sanitation sub sector has identified following five Intermediate Outcomes to achieve the End of SP outcome 5 of ***"Increased access to improved basic sanitation and hygiene practices, improved wastewater management systems"***

5.1 Improved access to basic sanitation

5.2 Effective implementation of nationwide education and awareness campaigns on sanitation and wastewater management

5.3 Strengthened legal, regulatory, policy framework and compliance

5.4 Improved knowledge and capacity of the Sanitation Subsector IAs

5.5 Sustainable wastewater and sanitation infrastructures developed and maintained

The Intermediate Outcomes are aimed at creating national awareness on sanitation and hygiene-related issues particularly for vulnerable communities, increasing compliance to sanitation and wastewater standards and regulations, building the capacity of Implementing Agencies to implement statutory roles and responsibilities and increasing the number of commercial properties connected to the sewer network in the CBD as well as access to improved public toilet facilities. Further aims include the strengthening of partnerships and advocacy to achieve outcomes.

The Sanitation Outcomes Map in Table 24 lists in full the hierarchy of outcomes as well as the outputs, activities and inputs required to realise the Sector Plan Outcome.

The Performance Framework for the Sanitation sub sector (Table 25) establishes the core performance questions and associated indicators to enable sub sector progress and performance to be monitored in terms of the attainment of the *Intermediate* and *End of SP Outcomes*.

Table 24: Sanitation Outcomes Map

SDS KPO 9	**Access to Clean Water and Sanitation Sustained**					
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.**					
ESPO 5	**Increased access to improved basic sanitation and hygiene practices, improved wastewater management systems**					
Intermediate Development Outcomes	5.1 Improved access to basic sanitation	5.2 Effective implementation of nationwide education and awareness campaigns on sanitation an wastewater management	5.3 Strengthened legal, regulatory, policy framework and compliance		5.4 Improved knowledge and capacity of the Sanitation Subsector las	5.5 Sustainable wastewater and sanitation infrastructures developed and maintained
Outputs	Urban Sanitation Survey Reports indicating an increased number of population with improved access to basic sanitation	Annual World and National Sanitation/ Toilet Day commemorated	Increased developments complying with relevant legal, policy and regulatory frameworks	National Discharge Effluent Standards	Capacity building programs conducted involving the sanitation las each year (including Twinning Arrangements, and short tem trainings and attachments)	Maintenance of Public Toilets and Sludge facilities conducted / Geomembrane lining for Vaiaata Sludge facility
	Increased number of households using onsite alternative wastewater technologies (biogas, natureloos)	Increased number of households with improved awareness on sanitation, wastewater management and hygiene issues	Updated National Sanitation Policy	National Building Code	Assessments conducted on critical areas including research on key sanitation issues	Compliance of Effluent Discharge with specific standards / Wastewater Treatment Plant Utilisation reports
Activities	5.1.1. Provide subsidized support targeting the improvement of septic tank for low income households living within/nearby critical environment in reticulated water supply areas	5.2.1. Plan, Coordinate and Implement awareness programmes for targeted groups/communities on good hygiene practises, improved sanitation facilities/wastewater systems, national building code i.e. video documentaries, brochure, consultations etc	5.3.1. Implement Sanitation MOU to guide programme implementation, coordination monitoring of critical sanitation and wastewater issues that may arise		5.4.1. Conduct annual Apia Urban Sanitation Surveys to assess level of compliance with 2010-2016 urban sanitation surveys as baseline	5.5.1. Construct new public toilets where feasible and upgrade existing public toilets facilities at the Flea Market in Savalalo and Malaefatu ground
	5.1.2.Provide subsidized support targeting the improvement of septic tank for low income and vulnerable households reliant on open privies and in rain water harvesting locations	5.2.2. Strengthen collaboration with local service providers through the PPP Initiative to increase understanding on existing sanitation related policies, legislations, regulations and standards	5.3.2. Enforce and update the approved Code of Environmental Practise for Odour control		5.4.2. Conduct assessments to determine level of contamination from sanitation and wastewater systems at selected locations	5.5.2. Identify suitable locations for two additional sludge disposal facilities and continue to monitor and maintain sludge facilities at Tafaigata and Vaiaata
	5.1.3. Improve on current onsite wastewater technologies such as biogas system designs and available waterless technologies	5.2.3. Target the ANM programme to increase public awareness on sustainable sanitation and waster systems, standard plans and utilize as a tool for data collection nationwide	5.3.3. Develop and Implement the National Effluent Standard and Annual Monitoring Programme		5.4.3. Establish Twinning Arrangement with recognised Institutions to address human resources development where relevant	5.5.3. Conduct regular health and environmental monitoring of sludge treatment facilities and public toilets maintenance and operations
	5.1.4. Identify alternative cost-effective onsite wastewater systems for community and hotel use	5.2.4. Strengthen political advocacy related issues through the SPAGL as a mechanism to promote public health and safe environment	5.3.4. Develop a system to share and manage all sanitation and wastewater information/data			5.5.4. Update and Maintain the existing sewage network model
		5.2.5. Annual Commemoration of the World Sanitation Day	5.3.5. Enforce and monitor (via annual reviews) the National Sanitation Guidelines for school sanitary facilities and public toilets			5.5.5. Connect remaining commercial properties within the existing service areas to the WWTP
			5.3.6. Review the National Sanitation Policy			5.5.6. Reduce ingress of storm water to sewer network
			5.3.7. Develop a Regulation on collection, transportation, use, disposal and treatment of wastewater sludge			5.5.7. Upgrade wastewater facilities
			5.3.8. Develop and Implement Standard/Guideline for Sanitation & Wastewater Systems Design applicable to various environmental settings			5.5.8. Construct 12 Garden Toilets at selected locations
Inputs	Financial, Physical and Human Resources and Human Capital	Financial, Physical and Human Resources and Human Capital	Financial, Physical and Human Resources and Human Capital		Financial, Physical and Human Resources and Human Capital	Financial, Physical and Human Resources and Human Capital
Getting Started	Donor confirmation of funds					
	Subsector Memorandum of Understanding					
	Required Technical Assistance					
	Capacity Building Programmes					

Table 25: Sanitation Performance Matrix

End of Sector Plan Outcome (ESPO) 5	Performance Questions	Intermediate Outcomes	Key Performance Indicators	Methodology	Unit	Baseline FY15/16	TARGETS				Means of Verification	Responsible Ias	Timing of Data Collection
							FY16-17	FY17-18	FY18-19	FY19-20			
5) Increased access to improved basic sanitation and hygiene practices, improved wastewater management systems	**Has basic sanitation been improved?**	***5.1 Improved access to basic sanitation***	**Population with improved access to basic sanitation**	% of Households using improved sanitation facilities at the minimum of a VIP Latrine	Cumulative %	97	97.5	98	98.5	99	WASH Baseline Survey, National Water and Sanitation Census	MNRE- PUMA, MOH- NSIHRD, MWTI- AMB	Annually
				% of Urban Apia Households with approved septic tanks systems	Cumulative %	44	49	54	59	64	Annual Subsidy Scheme, Annual Urban Sanitation Survey	MNRE- PUMA, MOH- NSIHRD, MWTI- AMB	Annually
				% of targeted schools with improved sanitation facilities and good hygiene practices	Cumulative %	10	20	30	40	50	National School Sanitation Assessment	MOH- NSIHRD	Annually
				Number of households using alternative onsite wastewater technologies (biogas, natureloo)	Cumulative No	2	3	4	5	6	Pilot Reports	MNRE_ RED	Annually
	Have nationwide education and awareness campaigns on sanitation and wastewater management been developed and implemented effectively?	***5.2 Effective implementation of nationwide education and awareness campaigns on sanitation an wastewater management***	**Commemoration and Implementation of the Annual World Sanitation Day**	Annual commemoration of the World and National Sanitation Day	No pa	1	1	1	1	1	Annual Review Reports, Subsector Reports, Cabinet Directive	MNRE- PUMA, MOH- NSIHRD, MWTI- AMB	Annually
			Households with improved awareness on sanitation including wastewater management and good hygiene	% of targeted households with improved awareness on sanitation including wastewater management and good hygiene	Cumulative %	60	65	75	85	95	National Sanitation Survey	MNRE- PUMA, MOH- NSIHRD, MWTI- AMB	Annually
	Have regulatory frameworks, compliance and accessibility to all sanitation information been strengthened?	***5.3 Strengthened legal, regulatory, policy framework and compliance***	**Developments complying with relevant legal, policy and regulatory frameworks**	% of new developments (residential, commercial and public) complying with existing policies, legislations (National Building Code) septic tank standards, PUMA Act 2004, National Sanitation Policy and Health Ordinance 1959 etc.	Cumulative %	25	35	45	55	65	Applications for DCs, Building Permits, Inspection Reports	MNRE- PUMA, MWTI- AMB	Annually
	Have the Sanitation Subsector IAs capacity and professional development been strengthened?	***5.4 Improved knowledge and capacity of the Sanitation Subsector Ias***	**Capacity Building programs involving the Sanitation Ias**	Number of capacity building programs involving the sanitation Ias each year (including Twinning Arrangements, and short tem trainings and attachments)	No pa	5	1	1	2	2	Capacity Building reports	All Sanitation Subsector Ias	Annually
			Assessments conducted in critical areas on key sanitation issues	Number of assessments conducted in critical areas including research on key sanitation issues	No pa	2	1	1	2	2	Assessment Reports and Research Publications	MNRE- PUMA, MWTI- AMB	Annually
	Has sustainable wastewater and sanitation infrastructure been developed and maintained?	***5.5 Sustainable wastewater and sanitation infrastructures developed and maintained***	**Utilisation of the Wastewater Treatment Plant**	% Utilisation of WWTP- Wastewater treated/ design capacity	%	54	60	65	70	75	SWA Annual Reports	SWA- WWD	Monthly
			Compliance of Effluent Discharge	% Compliance of Effluent Discharge to specific standards	%	100	100	100	100	100	SWA Annual Reports	SWA- WWD	Monthly
			Upgraded Public Toilets including new facilities	No of Public Toilets upgraded (including construction of new facilities eg Garden Toilets)	No. Pa	1	1	1	1	1	MNRE Annual Reports	MNRE- DEC	Annually
			Public Toilets fully operational and compliant with national sanitation/ hygiene guidelines	Cumulative No of Public Toilets fully operational and comply with national sanitation/ hygiene guidelines	Cumulative no.	3	4	5	6	7	MNRE / MOH Annual Reports	MNRE- DEC, MOH- NSIHRD	Annually

5.4.6Flood Mitigation

The following five Intermediate Outcomes have been identified to mitigate impacts of flooding in the CBD, strengthen the enabling environment, build the capacity of the key implementing agencies, and improve enforcement and strengthening of awareness programs to encourage stakeholder participation in order to address negative behaviours toward care of public drains and river channels.

6.1 Strengthened enabling environment for flood mitigation initiatives through effective policy and legal frameworks
6.2 Flooding incidences within the CBD mitigated
6.3 Enhanced capacity of the Flood Mitigation Subsector IAs
6.4 Increased public awareness targeting communities with direct impact on the Drainage Network
6.5 Strengthened Stakeholder Partnerships and Collaborations

The aim of the above is to achieve the End of SP outcome 6 of "***flood mitigation measures strengthened to reduce incidence and magnitude of flooding in the CBD***".

The Flood Mitigation Outcomes Map in Table 26 lists in full the hierarchy of outcomes as well as the outputs, activities and inputs required to realise the Sector Plan Outcome.

The Performance Framework for the Flood Mitigation sub sector (Table 27) establishes the core performance questions and associated indicators to enable sub sector progress and performance to be monitored in terms of the attainment of the *Intermediate* and *End of SP Outcomes*.

Table 26: Flood Mitigation Outcomes Map

SDS KPO 9	**Access to Clean Water and Sanitation Sustained**							
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.**							
ESPO 6	**Strengthened flood mitigation measures to reduce incidence and magnitude of flooding in the CBD**							
Intermediate Development Outcomes	6.1 Strengthened enabling environment for flood mitigation intiatives through effective policy and legal frameworks			6.2 Flooding incidences within the CBD mitigated		6.3 Enhanced capacity of the Flood Mitigation Subsector IAs	6.4 Increased public awareness targeting communities with direct impact on the Drainage Network	6.5 Strengthened Stakeholder Partnerships and Collaborations
Outputs	Drainage MoU finalised and endorsed	Flood Mitigation/ Management Policy developed	Updated Drainage Standards	Increased length of drainages maintained on a regular basis	Update of drainage information on the Asset Management System	Capacity Building programs undertaken for Flood Mitigation Subsector Ias	Increased Consultations and Awareness programs for relevant communities	Bi-monthly subsector meetings with relevant minutes and reports developed
	Drainage Design Manual developed	Discharge Run-Off Standards developed	Drainage Master Plan developed	Increased number of drainage works undertaken within the drainage network	Incidences of flooding within CBD reduced			
Activities	6.1.1 Finalise and endorse MoU			6.2.1 Undertake routine maintenance of the drainage network within specified zones – Drainage network within CBD		6.3.1 Recruit qualified staff	6.4.1 Implement community drains programme for priority communities	6.5.1 Carry out regular Subsector Meetings to document drainage upgrading works by key service providers and resolve drainage issues put forward by members
	6.1.2 Develop Flood Mitigation Policy			6.2.2 Expand the perimeter for routine maintenance of the drainage network to other suburban outskirts of the CBD		6.3.2 Encourage the facilitation of Stakeholder Trainings and Workshop Meetings on how to better monitor and upgrade public drains within the vicinity of the AUA	6.4.2 Design and implement a TV Campaign to encourage a 'no pollution' and 'no rubbish' policy in targeted river and drainage systems	6.5.2 Regulating bodies to strengthen enforcement of existing legislations to impose penalties on Offences and illegal practises affecting public drains
	6.1.3 Review Ministry of Works Act 2002 and Public Drains Regulations 2007			6.2.3 Prepare detailed designs for drainage upgrade within the CBD			6.4.3 Erect signage to warn people not to dump solids and liquids in targeted river and drainage systems	6.5.3 Subsector and Komiti o Alavai to carry out regular monitoring inspections of all public drains included in the CBD drainage network
	6.1.4 Develop a Drainage Design Manual			6.2.4 Construct drainage upgrades			6.4.4 Produce TV Spots to further inform the public of the existing Regulations covering offences and illegal activities affecting public drains.	6.5.4 All subsector members to effectively monitor natural/public drains that are part of their jurisdictions to avoid drainage blockage and poor maintenance
	6.1.5 Review and Update the (Road) and Drainage Standards			6.2.5 Update the Asset Management System/Database for all existing and newly constructed drainage infrastructure				
	6.1.6 Develop discharge / run-off standards for the drainage system to prevent drainage problems like blockages as a result of debris and oil (from restaurants)			6.2.6 Update existing Drainage Network Mapping				
	6.1.7 Develop a Drainage Masterplan							
Inputs	Financial, Physical and Human Resources and Human Capital			Financial, Physical and Human Resources and Human Capital		Financial, Physical and Human Resources and Human Capital	Financial, Physical and Human Resources and Human Capital	Financial, Physical and Human Resources and Human Capital
Getting started	Donor confirmation of funds							
	Subsector Memorandum of Understanding							
	Required Technical Assistance							
	Capacity Building Programmes							

Table 27: Flood Mitigation Performance Matrix

End of Sector Plan Outcome 6	PERFORMANCE QUESTIONS	Intermediate Outcomes	Key Performance Indicators	Methodology	Units	BASELINE	TARGETS				Means of Verifications	Responsible Ias	Timing for Data Collection
						2015/16	2016/2017	2017/2018	2018/2019	2019/2020			
6) Strengthened flood mitigation measures to reduce incidence and magnitude of flooding in the CBD	Has the enabling environment for flood mitigation initiative been strengthened through robust and effective policy and legal frameworks?	6.1 Strengthened enabling environment for flood mitigation intiatives through effective policy and legal frameworks	Drainage MOU developed and entered into	Develop Drainage MoU	Document	95% Completion		MoU endorsed	MoU monitored	MoU monitored	Signed MoU	MWTI- LTD	Completed in FY17/18
			Flood Management/ Mitigation Policy formulated and approved	Development of a Flood Management / Mitigation Policy	Policy	n/a	50% of Policy formulated	Policy completed	Policy enforced and monitored	Policy enforced and monitored	Endorsed Policy	MWTI- LTD, LTA	Completed in FY17/18
			Drainage Design Manual developed and implemented	Develop Design Manual	Manual	n/a	Finalise TOR for consultancy service and procurement		Manual in place		Endorsed Manual in place	LTA	Completed in FY18/19
			Review and Update of the (Road) & Drainage Standards	Review and update the (Road) and Drainage Standards	Updated Standards	n/a	Review completed	Updated Standards in place			Updated Standards	MWTI- LTD, LTA	Completed in FY17/18
			Discharge Run Off Standards	Develop Discharge Run Off Standards	Standard Document	Consultancy Procurement	Review of Roads, Drainages and Culverts Standards	Roads, Drainages and Culverts Standards in place	Standards enforced and monitored	Monitoring and enforcement	Standards in place	MWTI- LTD, LTA	Complete in 2017/18
			Drainage Master Plan developed	Develop Drainage Masterplan	Plan	n/a	Secure funding	Procurement Process	Drainage Master Plan in place	Implementation	Implementation	MWTI- LTD, LTA	Complete in 2018/19
	Have the measures put in place to reduce incidence/magnitude of flooding in the CDB been effective?	6.2 Flooding incidences within the CBD mitigated	Length of Drainage network maintained and working effectively.	Cumulative number of kilometers of drains being maintained on a regular basis	Cumulative Km	85 km	87km	89km	91km	93k m	Contact documents, Contractors monthly reports and LTA drainage network asset management system information	LTA	Annually
			Drainage upgrade works within the drainage network	Cumulative number of drainage upgrade works within the drainage network	Cumulative no	n/a	2	4	6	8	Contract documents, Drainage upgrade works completion report and LTA drainage network asset management system information	LTA	Annually
			Registration of drains in the Asset Management system	Number of drains registered in the AMS	km	87.5	90	95	100	105	Contract documents, Drainage upgrade works completion report and LTA drainage network asset management system information	LTA	Annually
			Flooding events during the wet season reduced	Percentage change in the number of flooding events reduced	%	-20%	Baseline-25%	Baseline- 30%	Baseline- 35%	Baseline-40%	Contract documents, Drainage upgrade works completion report and LTA drainage network asset management system information	LTA	Annually
	Has the legal framework been reviewed and enforced?	6.3 Enhanced capacity of the Flood Mitigation Subsector las	Capacity Building programs undertaken for the Flood Mitigation- Drainage Subsector las	Number of capacity building programs per annum	No pa		1	1	2	2	Capacity Building Reports	MWTI- LTD, LTA	Annually

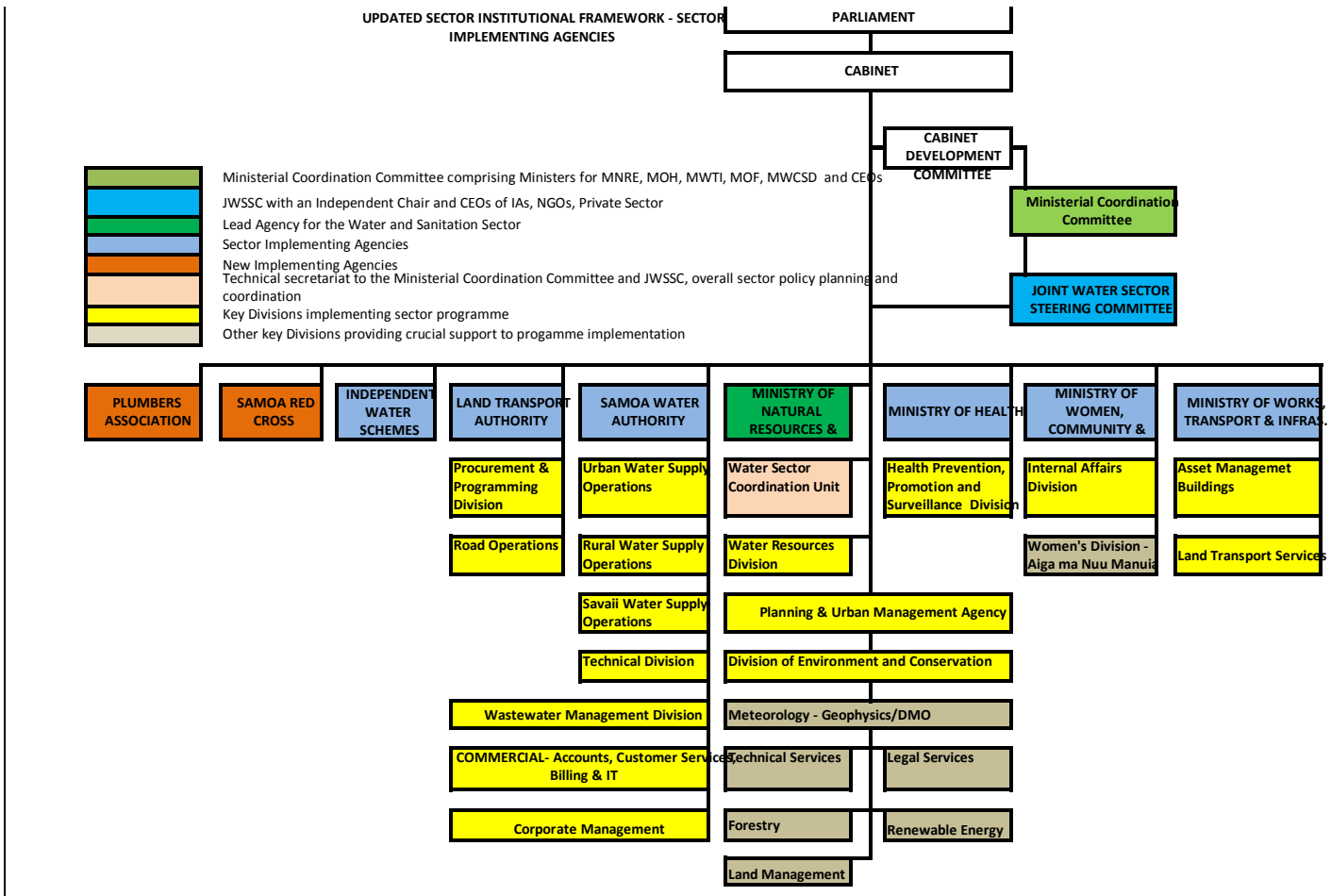
Chapter 6: Implementation Arrangements

6.1 Institutional & Organisational Structure

Since 2005, Samoa has undertaken a wide-ranging reform of the water sector and established a comprehensive institutional framework for the management and development of the country's water resources. This has gone hand in hand with other national initiatives including privatisation and decentralisation which were geared towards the redefinition of the roles of the different levels of government, with the central government creating the enabling environment for action by communities and the private sector. Through an effective partnership with the Samoa Red Cross the Sector has been able to prioritise the needs of vulnerable households through initiatives such as the MDG Project. This has enabled the Sector to increase access and coverage of improved water and sanitation services, so that Samoa has achieved its MDG targets. The Sector has also forged an effective partnership with the Plumbers Association (PAS) to improve the poor quality of plumbing at the household level.

The sector institutional arrangements for sector IAs is reflected in Figure 17.

Figure 17:Updated Sector Institutional Framework Sector Implementing Agencies



6.2 Institutional Roles and Responsibilities

The Water & Sanitation Sector is an institutionally complex Sector, with a diverse range of stakeholders and no one agency/institution with sole responsibility for all water management and development functions. This results in challenges of coordination and integration of activities across the Sector. A summary of the functions and roles of the key Sector stakeholders is presented in Table 28:

Table 28: Implementing Agencies and Key Sector Stakeholders with Core Functions

Institution	Core Functions and Roles
Government Agencies	
MNRE	Lead agency responsible for secretariat role to JWSSC via WSCU. Responsible for policy guidance, coordination and regulation of all water and sanitation activities including provision of oversight and support services to the local governments and other water supply service providers. Also responsible for water resource management (WRD), waste management systems (DEC), lead agency for sanitation policy and programme (PUMA) and disaster preparedness and coordination (DMO), rainfall and temperature data and weather services information (Meteorology) and the implementation of renewable energy projects and initiative (RED).
MWCSD	Leads the facilitation of community engagement towards achieving sector objectives and in particular monitors services provided by Independent Water Schemes through a Performance Contract with the IWSA. The Ministry also oversees overall administration and implementation of the MDG Initiative: Increased Access to safe Drinking Water, Improved Sanitation and Food Security.
MoH	Provides regulatory and monitoring services to promote quality water supply, improve sanitation, increase health promotion programs and provide technical advice at all levels for effective decision making.
MoF	Mobilisation and allocation of financial resources including coordination of donor inputs and the privatisation process. Also responsible inter-sector coordination, the SDS and higher level performance monitoring. Performance monitoring of SOEs (SWA and EPC)
MWTI	Monitoring and regulation of works transport and infrastructure related development including water supply and drainages. New mandate currently under review following the creation of LTA. Also responsible for the review and update of the National Building Code.
MAF	Planning, coordination and implementation of all agriculture development in the country including irrigation development, aquaculture and livestock development.
MESC	Promotion of sanitation and hygiene education in schools and monitoring of school sanitation facilities.
Government Corporations	
EPC	Semi-autonomous entity responsible for the delivery of electricity supply including generation of hydropower
SWA	Semi-autonomous SOE responsible for the delivery of a piped water supply service to approximately 80% of the population of rural and urban areas of Upolu and Savaii; and a sewerage service to approximately 70% of commercial properties in Apia CBD.

	Approximately 35 river and spring intakes, 10 water treatment plants and 60 reservoirs and tanks and 43 bore supply systems for rural and urban water supply and 1 urban sewerage system.
STA	State Owned Enterprise responsible for implementation of Garden Toilets funded by the sector and ongoing monitoring of sanitation facilities of resorts and hotels.
LTA	Semi-autonomous entity responsible for road maintenance including public drains affecting the road reserve.
Civil Societies and Communities	
IWSA	Registered as an Incorporated Society (NGO) under the Companies Act 2006. Main role is to provide strategic advice and management of the Independent Scheme developments. One of the key NGOs involved in water sector activities have formed a network called the Independent Water Schemes Association (IWSA) for providing strategic services to 33 schemes that are not currently part of the SWA network. Was established with funding from the EU WaSSP in 2008 with continued core funding being provided via MWCSD in the 2009/10 and 2011/12 annual budget.
Plumbers Association Society	Newly formed organisation with the main goal of providing guidance and establishing standards for national plumbers to ensure consistency in quality and services. The PAS will greatly contribute towards improved water use efficiency at the user /household level.
SUNGO	Supplement the public sector efforts and ensure that concerns of the underprivileged/poor are catered for. Also provide financial and planning support to CBOs and NGOs who are affiliated with them.
Samoa Red Cross Society	Provision of technical oversight to rain water harvesting projects, development of standards for rain water harvesting and provision of advice and guidelines for project implementation. Delivery of rain water harvesting projects either through Red Cross funding or in conjunction with other stakeholders as a development partner. Supplement the provision of water supplies such as water tanks during disasters. Provision of education and training regarding sanitation, health and hygiene issues around water storage and use.
Development Partners	
Development Partners	Provide financial and technical resources for implementation of water and sanitation sector activities. Monitoring and evaluation of performance. EU is recognised as key development partner providing support to the sector. Other current partners include JICA, ADB, AusAID and SPC/SOPAC
Private Sector	
Contractors, private firms etc.	Valuable resource for design, construction, operation and maintenance of water and sanitation facilities. Also conduct training and capacity building for both government and NGOs. Provision of other commercial services including mobilisation of financial and human resources for water sector development activities.

6.3 Sector Monitoring and Evaluation

6.3.1 Sector Monitoring and Review Process

The current reporting and monitoring procedures have ensured coordinated and periodic reporting on all Sector activities by the different stakeholders and has greatly improved on information flow between the government, development partners, NGOs and the private sector. The key features of the current water sector monitoring and reporting arrangements include:

- Establishment of short, medium, and long term national and Sector targets based on national development priorities and objectives.
- Establishment of performance targets and measurable indicators for the different sub-sectors.
- Submission of monthly and annual progress reports by key Sector agencies to WSCU and JWSSC.
- Submission of consolidated quarterly and annual progress reports by WSCU to JWSSC for onward transmission to MoF.
- Quarterly monitoring and quality assurance visits to selected community/business sites for on-the-spot assessment of their performance and quality of outputs.
- Hosting of annual joint government/donor Sector performance reviews.

The WSCU among other functions carries out periodic monitoring, evaluation and quality assurance of all water and sanitation related activities. WSCU currently coordinates the following monitoring and reporting activities to assess performance of Sector agencies against set targets and make recommendations on corrective measures during the subsequent reporting period:

- Monthly Progress Reports to Technical Steering Committee (TSC) and Sub-Sector Working Groups
- Quarterly Progress Reports to JWSSC;
- Annual Sector Status Reports, and;
- Baseline Water, Sanitation and Hygiene (WASH) Survey.

One of the key processes is the annual sector review usually held in October/November and attended by Sector ministries, civil society and political leaders, NGOs, private sector and representatives of development partners. During these reviews, a comprehensive review of the performance of the Sector is carried out, shortcomings discussed and undertakings for addressing priority issues during the following year agreed upon. Annual Sector Status Reports are prepared and circulated to all stakeholders for review and information.

The Baseline WASH Survey (MNRE, 2015), commissioned by the WSCU and undertaken in partnership with the Samoa Bureau of Statistics, was the first comprehensive national scale survey to be undertaken in Samoa. Its primary purpose was:

- to gain a better understanding of the water and sanitation situation nationally thereby enabling more effective targeting of Sector programs;
- to collect information about knowledge, attitudes and practices of the population regarding water use, sanitation status and hygiene behaviours;

- to provide data of national as well as international relevance, through the adoption, to the extent possible, of international definitions, standard practices and protocols

The Baseline WASH Survey will be repeated periodically[53]to update knowledge and progress nationally, and to facilitate regional and international comparisons.

In addition, periodic service delivery surveys and specific independent surveys will be conducted by different stakeholders to meet more specific needs. This will complement and assist with monitoring policy benchmarks, national and Sector targets, performance indicators, reporting guidelines and standards that have to be followed by all stakeholders in the Sector.

6.3.2 Independent Evaluation

An independent evaluation on the implementation of the Sector Plan is conducted every two years to provide a unique independent perspective of sector achievements and to document the lessons learned, as well as to make specific recommendations where appropriate. The scope of the evaluation process will encompass sector achievements in terms of efficiency, effectiveness, intermediate impacts and outcomes and sustainability issues.

6.3.3 Sector Performance Matrix

This edition of the Sector Plan conforms to the SMERF designated Outcomes Mapping approach. Using this approach for the first time[54], sector monitoring will take place against the performance criteria, indicators and targets established in the Outcomes Maps and Performance Matrices[55]. The Outcomes Map and Performance Matrix will therefore act as an 'outcomes' based reporting framework for the Sector Plan.

6.4 Implementation Strategy

6.4.1 Sector Coordination Framework

An effective and elaborate institutional framework has been put in place to coordinate and facilitate integration of planning, programming, implementation, monitoring and evaluation across the Sector. Nine committees have been established and make up the sector coordination framework.

A Ministerial Coordination Committee (MCC) is still have yet to be established to strengthen political advocacy and support and will comprise of the Ministers from MNRE, MoH, MoF, MWCSD, MWTI and respective CEOs. This committee is the interface between CDC, Cabinet and the Sector. Their main task is to review policy issues affecting the Sector and advocate Sector issues at the political arena.

The JWSSC chaired by an independent chairperson, comprises CEOs from key IAs, Private Sector and NGOs with representatives from key development partners and reports to the MCC on national issues. The WSCU provides secretariat functions and support to the JWSSC as well as to the MCC.

Reporting to the JWSSC is the Technical Steering Committee (TSC) chaired by the WSCU. The role of the TSC is twofold; (1) monitors technical and financial progress of agreed sub-sector programmes and (2) leads the development and / or review of Sector policies/strategies. The TSC is made up of IA coordinators or chairs of each sub-sector committee as presented in Figure 18 below. Six

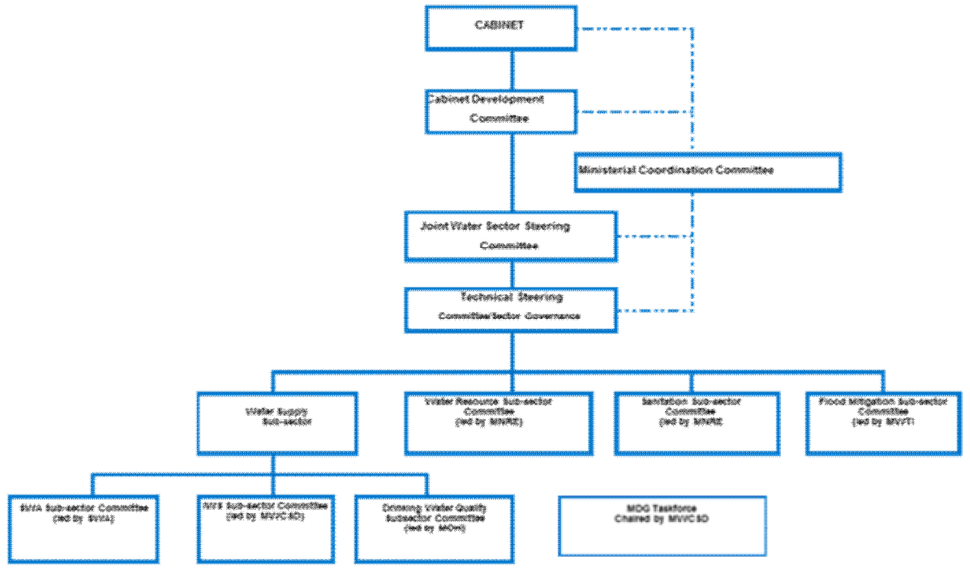
53Every 4 years.

54 Previous editions of the Sector Plan have used a LogFrame methodology and a Performance Framework

55 The Outcomes Maps and Performance Matrices for the six sub sectors are given in Section 5.4.

subsector committees have been set up to facilitate and coordination implementation of Sector developments including policy development, regulation etc. These committees meet on a monthly/bi-monthly basis and are responsible for coordination of programme implementation, planning, budgeting and monitoring. They report to the TSC on a monthly basis on subsector financial and technical progress.

Figure 18:Sector Committees



6.4.2 Sector Institutional Capacity Building Support

The GoS is focusing on building the capacity of the water and sanitation sector institutions as well as promoting increased private sector participation and effective community participation in all water and sanitation sector activities. A critical constraint is the limited skilled human resources in Samoa and the need for institutions to attract and retain key personnel and provide continuous opportunities for skills upgrading.

To address this constraint, the WSCU will prepare[56] a capacity building strategy and action plan for the Sector as a whole that will draw on the capacity building plans of the separate implementing agencies. The key objectives of such a strategy and action plan will be:

- to ensure that Sector institutions planning processes recognise that the ultimate source of value is people – the organisations employees

56 A Draft Sector Capacity Building Plan was prepared in 2013. This will be revised and then rolled out during the tenure of the current Sector Plan.

- to develop a human resources management approach to include annual performance assessments, career path development, incentives, performance rewards and targeted training
- to design and manage culture, work environment, and organisational processes that will retain good staff and ensure everyone does their job better
- to identify the Sector institution's competencies and match people to these
- to match skills with job requirements
- to ensure the resourcing activities contribute to the development of competencies for now and into the future
- to assess and satisfy performance requirements to meet Sector institution's objectives
- to continually review and build organisational commitment.

Sector capacity remains one of the key challenges for the Sector, and this will continue to be an issue for Samoa across many, if not all sectors. The Budget Support has helped alleviate the capacity gap through short term consultancies and TA.

6.4.4 Resource Mobilisation and Management Strategy

Reliable and adequate financing and human resources are important for achieving the Sector targets, and remain a major challenge. As the sector's institutional capacity has developed, it has been able to progressively manage its financial disbursements more efficiently. With the establishment of a specific Procurement Unit in 2013, SWA has significantly improved its procurement policies and procedures, and its capacity to manage an increased tender/ procurement load.

The increasing frequency of natural disasters, driven by climate change, can have a significant impact on sector resourcing. Tropical Cyclone Evans had a major impact on SWA assets and operations and the impact on the national economy was put at almost 30% of GDP[57]. with the estimated financial cost of the cyclone disaster (estimated by World Bank) amounts to SAT 480 million (about US$210 million)—equivalent to almost 30% of GDP. TC Evans also affected Sector planning and negatively impacted progress towards achievement of some Sector targets[58].

This Water for Life Sector Plan will maintain the previous strategy which has been effective in mobilising and ensuring the availability of sufficient resources for the Sector. This strategy has been based on the following tenets:

- clear demonstration of the links between sustainable WfL management with outcomes in the key SDS targets, especially for the WfL dependant sectors such as health, infrastructure etc;
- ensure measures take into account absorption capacity and ensure effective utilisation and accountability of both technical and financial skills/resources;

57 Total estimated cost of the cyclone disaster (estimated by World Bank) amounts to SAT 480 million (about US$210 million)—equivalent to almost 30% of GDP. MF Country Report No. 13/162, June 2013.

58This was taken into consideration in EU funding disbursements, and additional lump sums were also allocated over and above, for the recovery effort.

- undertake clear performance assessment that indicate the returns on investments in terms of the results. This will particularly target mobilising more resources from the public purse (Budget);
- design of large scale, integrated programmes themes with a medium to long term scope rather than small short-term project;
- proactive identification of resource shortfalls for key investments by the sector in light of time-bound funding commitments by major development partners e.g. EU Budget Support Programme commitments only up to 2020;

Chapter 7: Resource Requirements

7.1 Overview

Sector financing is predominantly EU funded and currently in the form of Sector Budget Support since 2010.This funding modality requires the use of government PFM systems, processes and national procurement policies and guidelines which has given the sector a high degree of flexibility in allocating both local and donor financial resources according to national priorities and development objectives.

To access funds, Sector IAs are required to bid and to an extent compete for funds with proven capacities to implement and sustain investments. Disbursement of funding under sector budget support is performance based. A total of five performance indicators are identified under the present Financing Agreement for EDF 11 between the Government and the EU and measures the Sector's performance in relation to the following:

- Improved Drinking Water Quality of SWA treated water supplies;
- Reduced Non-Revenue Water in Defined Service Areas of SWA;
- Improved Collection Efficiency of SWA Operations;
- Upgrading of Hydrometric Stations to allow for real time data collection by the WRD- MNRE
- Length of Drainage Maintenance works undertaken by LTA

The sector has been implementing its long term investment plan approved in principle by the JWSSSC in 2009 which has been reviewed over time following the tsunami in September 2009 and Tropical Cyclone Evan in 2012 which had substantial impacts on the water and sanitation sector developments. These natural disasters led to the reprioritisation of the sector investments and resulted in the sector being able to secure additional funding from EU for the recovery efforts.

A 10 year rolling investment plan has been developed and implemented by SWA over the years which has prioritised investments which focused on optimising the social, operational and financial performance of existing facilities and systems, secure alternative sources of supply for the dry seasons, service area expansion investments, improve office facilities and building the capacity of employees to improve performance. The plan envisages an expenditure of approximately SAT100million over the next 10 years.

Climate change and disaster implications have been essentially factored into the Sector investment plans overall. The sector is now committed to explore and adopt 'climate smart' and sustainable water solutions/ plans/ designs to improve and increase its resilience and readiness to extreme weather events namely extreme rainfalls and droughts.Samoa like many other pacific islands is endowed with what may seem and endless provision of natural resources by mother-nature, sadly the unpredictable impacts of climate change exacerbates threats to the availability of water. While majority of Samoa's population has access to piped water, migration from the coast to inland areas, has increased and so has the demand on existing infrastructure. The SWA therefore through its network expansion and facility upgrade projects as well as collaborative work with the development of community based schemes by the Independent Water Schemes Association is enabling equal access by all

The promotion of rainwater harvesting tanks in vulnerable areas susceptible to droughts is of key importance to the sector.Through the kind assistance of the EU under its MDG Initiative program commenced in 2012 and completed in 2015, more than 6,000 people considered as part of the most vulnerable families in Samoa, now has access to water after receiving a rainwater harvesting tank under this program. Furthermore, the Sector was also able to assist some of these families as part of this same program, through the provision and installation of VIP Latrines and assist in the development of vegetable gardens to promote food security.

The protection of our water resources took a resolute stance given the more prominent effects of climate change. An integrated approach to its management will therefore be taken with a more inclusive community engagement. Management of watershed areas will continue to be strengthened through the establishment of reserves within critically threatened areas.

Various capacity building and professional development programs were conducted within and outside of the sector at which have made significant improvements to the capacity and capability of IAs to plan, implement and sustain investments in the long run. However, there are certain technical areas whereby capacity gaps remains and needs much attention for improvements. Hence, the sector needs to address these capacity gaps effectively through a systematic capacity building initiative. A 3- year sector capacity building action plan is already in place to be reviewed to assist with meeting the sector's training and professional development need

7.2 Costing Process of Planned Activities

Investments in the 4 years of this Sector Plan will focus on;

- Improving financial sustainability and asset management
- Reduction of NRW
- Strengthening of resources and staff capacity and
- Expansion of service to priority areas.
- Improving Drinking water quality
- Water resource monitoring
- Flood mitigation measures
- Increasing access to improved sanitation, wastewater systems and improved hygiene practices.

Delivery of the 4-year programme will cost approximately over SAT 121 million inclusive of national and project funds against total resources. More than 50% of the total resource envelope is provided through the EU Sector budget support which will diminish over the next 4 years. However when combined with GoS funding, it makes up 77% of national funding requirements. The balance (23% ie approximately SAT 45 million)will be made up from project funding from the Adaptation Fund (AF), LDCF, TCF, IWRM and 88% of total projects funds from the Green Climate Funds (GCF). The summary of key programme expenditure is noted below:

- An enhanced and effective **governance framework** to guide and sustain Sector developments will cost roughly SAT 4 million over the next four years.
- **Integrated water resource management** for sustainability of water sources will cost the sector approximately SAT 18 million and will give emphasis to improved watershed management through the development and implementation of watershed management plans, water resources monitoring, conservation of critical watershed areas as reserves to sustain water supplies and access to reliable water resource data through the implementation of a realistic resource monitoring programme and ecosystems preparedness to extreme weather events.
- **Increased access and improved provision of reliable, clean and affordable water supply** will cost the Sector approximately SAT 67 million in four years and will address SWA priority issues, strengthening of Independent Water Schemes and improvements to drinking water quality including rainwater harvesting and strengthening of the plumbing association in the country.
- **Increased access to adequate sanitation, improved wastewater systems with emphasis on improved hygiene practice** will cost about SAT 12 million including an additional funding provided through the MDG Initiative Project for its follow up monitoring program.
- Strengthening of **flood mitigation measures** will cost SAT 20 million and will be largely funded under the Global Climate Change Alliance (GCCA) project of approximately SAT9 million and from the Green Climate Funds of approximately SAT5.5million which will support the upgrades of drainage systems in nine priority segments and CBD coastal hazard area to accommodate flooding events.

The distribution of the funds by programme is summarised in Table 29:

Table 29: Sector Budget Performance and Annual Distribution

SECTOR PLAN SUMMARY BUDGET PER OUTCOME	2016-17	2017-18	2018-19	2019-20	Total 4-year program
SAT (m)					
Strengthened sector governance to sustain sector developments	$ 665,989	$ 1,329,763	$ 800,000	$ 850,000	$ 3,645,752
Enhance water resources resilience from Ridge to Reef	$ 3,302,229	$ 3,884,550	$ 5,000,000	$ 5,150,000	$ 17,336,779
Increased access and improved provision of reliable, clean and affordable water supply	$ 10,550,000	$ 18,151,925	$18,237,083	$ 19,444,195	$ 66,383,203
Improved surveillance of drinking water quality and water borne disease	$ 88,500	$ 500,000	$ 515,000	$ 530,450	$ 1,633,950
Increased access to improved basic sanitation and hygiene practices, improved wastewater management systems and accessibility to all sanitation information	$ 3,190,000	$ 3,619,525	$ 2,435,015	$ 2,487,066	$ 11,731,606
Strengthened flood mitigation measures to reduce incidence and magnitude of flooding in the CBD	$ 5,462,500	$ 4,664,375	$ 4,804,306	$ 4,948,435	$ 19,879,617
TOTAL PROGRAMME COST	**$ 23,159,218**	**$ 32,150,138**	**$31,791,404**	**$33,410,146**	**$ 120,510,907**

7.3 Financing Mechanisms

The main sources of Sector financing are from domestic revenues and development partners. Current funding trends show that the primary instrument for Sector financing over the medium and long-term will be Sector budget support and specific project support directly to sector Ministries, Corporations, and NGOs such as IWSA and possibly SUNGO and Plumbers Association as noted below:

- ***Sector Governance Programme***
  - MNRE – funding for the WSCU is provided to MNRE as recurrent budget as well as specific project grants.
- ***Water Resources Programme***

- MNRE - funding for water resources management activities is channelled directly as budget support to WSCU within MNRE and then disbursed to WRD during implementation. There are also project based funding arrangements for additional budgetary support such as the Pacific Resilience Program (World Bank), the Economy Wide Integration of Climate Change Project (GEF/UNDP), the Ridge to Reef IWRM Project (GEF/SPC) and the Green Climate Fund.

- ***Water Supply and Quality Programme***
  - SWA - funding for water supply and sanitation activities is provided to SWA by MoF as conditional loans, unconditional grants and CSO grants. The conditional loans and project grants are for the delivery of wastewater sewerage services, personnel, operational and capital works related to the delivery of water supply. The CSO grants are special funds meant to cover for inadequate revenue sources and where service levels are not financially viable.
  - IWSA– funding for water supply activities for independent schemes are provided through the MWSCD as a conditional grant. The conditional grants cater for IWSA personnel and operating costs
  - Funding for priority capital works related to the delivery of water supply to selected independent schemes is channelled through MWCSD.
  - MOH - funding is provided directly as annual recurrent and development project allocations by MoF to the Water Quality Unit (MOH).

- ***Sanitation Programme***
  - Funding for sanitation related activities is provided to three key ministries including MOH, PUMA (MNRE), MWTI as well as PAS, SWA and STA as conditional grants and annual recurrent and development projects allocations by MoF.

- ***Flood Mitigation Programme***
  - Funding is provided directly as annual recurrent and development project allocations by MoF to MWTI, PUMA (MNRE) and LTA.

In order to realise reliable and sustainable financing, the following additional funding mechanisms will be explored during the Sector Plan period.

- ***General budget allocation to the Sector*** is the main source for the bulk of the activities. The anticipated risk lies however in the inadequate annual allocations;
- ***Project support to specific sub-sectors within the Sector***. Ongoing projects under MNRE and other key agencies will provide funding for some of the activities included in the Sector Plan. This implies that the on-going and planned projects within the Sector will have to align with the priorities in the Sector Plan since these are based on the overall national priorities as reflected in the SDS;
- ***General budget and project support to other sectors*** in which water and sanitation issues are a key component. The main strategy to ensure this will be to enhance awareness raising, advocacy and networking activities, to engage the sectors in question and demonstrate how WfL issues are important in their sector. In addition support will be given to mainstream WfL issues into their sector plans, actions plans and budgets. The main sectors targeted include environment, energy, agriculture, health, community and education. Table 30 shows the indicative amounts by source.

Table 30: Indicative Commitments/Funding for the Sector Plan by Source

Resources Available/Sources of Funding	2016-2017	2017--2018	2018-2019	2019-2020	Total Resources Available for the 4-year program
	SAT				
General and Sector Budget Support					
EU Sector Budget Support inclusive of GCCA funding	$23,298,786	$21,780,000	$17,820,000	$13,530,000	$76,428,786
Government Contribution	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$16,000,000
Project Support					
EU Technical Facility Cooperation Fund	$200,000	$350,000	$200,000	$200,000	$950,000
IWRM - Rehabilitation of the Apia Catchment	$150,000	$460,000			$610,000
Pacific Resilience Program (PREP)	$100,000	$100,000			$200,000
LDCF	$200,000	$240,000			$440,000
Adaptation Fund (for SWA, IWSA and RWH)	$500,000	$3,650,000	$515,000	$530,000	$5,195,000
Septic Tank Subsidy Scheme	$1,142,500				$1,142,500
Green Climate Fund (WRD, MOH, LTA)		$5,557,665	$19,887,768	$11,540,070	$36,985,503
Total Funding/Budget Available from 2016-2020	$29,591,286	$36,137,665	$42,422,768	$29,800,070	**$137,951,789**

A comparison of funding estimates for the programme and budget commitments to the Sector (both budget and projects) indicates that the Sector Plan will face significant funding gaps in the last year of implementation (Table 31). This entails the need for the Sector to identify additional funding sources to ensure Sector programmes and targets and met within the agreed timeframe.

Table 31: Funding Gaps 2016-2020

Funding Request/Commitments by year					
	2016-17	2017-18	2018-19	2019-2020	Total 4-year programme
	SAT (m)				
Total Programme Budget	$23,159,218	$32,150,138	$ 31,791,404	$33,410,146	$120,510,907
Total Funding/Budget Available	$29,591,286	$36,137,665	$42,422,768	$29,800,070	$137,951,789
Funding Gap	**$6,432,068**	**$3,987,527**	**$10,631,363**	**-$3,610,076**	**$17,440,882**

7.4 Resources Allocation and Financial Management

The allocation of funds to the programmes, sub-programmes and activities has been guided by the priorities set for each of the 5 sub-sectors included in the Sector Plan. Expenditure will be incremental, and based on annual action planning and expenditure management. Current resource levels and budgetary allocations through the budget system are only set or available at Ministry level (set by negotiated ceilings) not by sector level which to some degree has limited the effectiveness and predictability of resource allocation for agreed sub-sector programmes. However, the Sector now has a better idea of the available level of resources over the next 3-5 through the EU funded WaSSP (set by fixed and variable resources depending on performance of sector) and detailed investments as the above Tables. Within the priorities reflected in the sector performance framework, the following constitute major instruments for priority expenditure and resource allocation as well as accountability.

7.4.1 Rolling Medium Term Expenditure Framework

To be implemented, policies and plans need financing which is usually provided through public budgets. In Samoa, as in most other countries, legally binding budgets (approved by parliament) cover only one year. The current forward estimates process undertaken by the MoF is similar to an MTEF in terms of coverage for three years. However, the approach is different and the results of the plus two years are not publicly available. This essentially means, the multi-year investment plans in the Sector are implemented through annual budgets which limit its effectiveness in terms of delivery and resource allocation.

The initial MTEF developed by external TA for the sector in 2008 was a highly technical and complicated process which was not adopted by the Sector. Subsequent reviews led to the 3rd update of the Sector MTEF in-house and led by WSCU. It involved an extensive consultative process with IAs in reaffirming priorities and cost estimates.

The three-year rolling expenditure plan is one of the key instruments guiding the expenditure priorities for the Sector. Similar to other sectors this plan sets out clearly how the priorities for each sub-sector will be implemented during the three years. However priority re-setting is expected subject to the size of the annual resource envelope, Ministry expenditure ceilings set by MoF and any unanticipated changes that might affect the priority arrangements. The current scope of the Sector MTEF only covers public funded expenditures of key agencies involved in Sector governance, water resources, water supply and quality, sanitation and flood mitigation sub-sectors. Linking the sector MTEF with annual budget programmes is still a challenge and will have to be improved over the Sector Plan period.

7.4.2 Annual Resource Performance Assessment

The process and criteria for allocating the identified resources into the respective sub-sectors is currently being refined and key steps towards this include:

1. Establish an annual Sector resource ceiling.
2. Determine the appropriate annual resource allocations (%) per sub-sector
    a. Sector Governance
    b. Water Resources
    c. Water Supply (SWA & IWS) including Drinking Water Quality

d. Sanitation and Wastewater
e. Flood Mitigation

3. Develop annual expenditures per sub-sector based on agreed Sector outputs and sub-outputs.
4. Allocate agreed sub-sector expenditures and projects to appropriate annual budget Ministry outputs for implementation.

Chapter 8: Conclusion and Way Forward

Summary

The Samoan water sector has performed well in the attainment of MDG targets for access to improved water and sanitation services, with 97% of the population (in 2015) having access to improved water and sanitation facilities. However, the Sector needs to refocus its efforts to improve standards of hygiene awareness and practice in order to reduce the current high incidence rates of diarrhoea and other water related diseases. Furthermore, while access to water has improved, the focus now needs to be on improving efficiencies of service, reducing water wastage and pumping costs, improving cost recovery and ensuring future levels of capital and recurrent expenditures are maintained.

The legislative and regulatory framework for the water sector is, at this stage in the reform process, largely in place. The focus now for the Sector is to focus efforts on monitoring and enforcement of the regulations in place.

Sector skills and capacity remain an ongoing challenge for the Sector due to the shortage of skills nationally, especially in the technical fields, and the competition with other sectors. The availability of adequate Sector finance is crucial to its ability to achieve its goal and outcomes. The long term budget support provided by the EU, and the more recent project-based funding from JICA, have contributed significantly to the Sector progress and achievements to date. The continued support of the EU and JICA over the life of this Sector Plan will maintain the strong donor partnerships developed and will enable the Sector to deliver on its outcomes.

Governance

An **effective governance framework** is largely in place to ensure the Sector operates effectively and cohesively, with the WSCU playing a key coordinating and leadership role. Improvements in Sector monitoring and data reporting are scheduled under this Sector Plan. An effective performance monitoring system to collate, review and interpret data from the sub sector agencies will allow managers and decision-makers to proactively manage resources efficiently, and take timely and effective action to deal with problems arising.

Building and maintaining sector capacity is essential for implementation of Sector plans and to achieve Sector outcomes. A critical constraint is the limited skilled human resources in Samoa and the need for institutions to attract and retain key personnel and provide continuous opportunities for skills upgrading. To address this constraint, the WSCU will review and update the sector's existing **capacity building strategy and action plan** for the Sector as a whole that will draw on the capacity building plans and needs of the separate implementing agencies. The plan will be funded and implemented during the tenure of this Sector Plan.

Water Supply

Significant support to the **rural and urban water sector** has been provided over the last decade and this has resulted in a measurable improvement in service levels greatly benefiting communities. However, the water sector continues to face significant challenges, foremost being the ability of the

core service providers (SWA and IWSA) to operate and maintain their water supply systems, and reduce unacceptable levels of water wastage.

One of the most important challenge facing the SWA is the **high level of NRW**, which has environmental and well as financial implications in terms of water wastage and lost revenue. This remains a priority for SWA and will continue to require significant resources over the longer term.

The Sector budget support has enabled **Independent Water Schemes** to be rehabilitated and upgraded providing rural communities with an improved and more reliable supply of untreated water. The challenge for IWSs and the IWSA is to improve the management, operation and sustainability of the IWSs.

The Sector has promoted **rainwater harvesting** as the primary source of water supply for vulnerable households and for those unable to be connected to the piped network. Rainwater tanks are also being promoted in urban areas as a secondary water source, and as a drought-proofing measure. Survey data suggests that 16% of households have a rainwater tank. While rainwater tanks will continue to be promoted, the Sector needs more information on the status of rainwater tanks (i.e. condition, level of maintenance, size/adequacy to meet households needs, water quality, etc) in order to strengthen future rainwater harvesting programs, and to encourage improved operation and maintenance by households.

Water Resources

The **Water Resource** sub sector plans to continue its program of strengthening watershed conservation and management and water related monitoring and information gathering in order to improve the understanding of water resources in the face of climate change impacts. The sub sector will continue to build and enforce the necessary legal framework, and to strengthen partnerships with stakeholders and support an enhanced role for communities as guardians of the fragile catchment environment.

Sanitation

While Samoa has achieved **high levels of access to basic sanitation**, the challenge and priority for the sanitation sub sector is: to improve levels of **hygiene awareness** and practice, in order to reduce the relatively high incidence of diarrhoea and typhoid in the country; to **improve septic tank standards of design and build**, by monitoring and enforcing new building codes, improving maintenance at the household level (i.e more frequent pump outs), and; by developing and trialling improved designs of septic tank in order to improve effluent quality being discharged to the groundwater table. Improvements in **wastewater management** will be achieved by upgrading the wastewater treatment facilities and encouraging more businesses to connect to the wastewater system.

Drinking Water Quality

Investments in additional chlorination facilities have resulted in an improvement in **drinking water quality** for SWA customers, and this program will be continued during this Sector Plan. It is expected that by 2020, over 70%of SWA customers will receive a chlorinated water supply that fully complies with the NDWQS. For IWS customers, the focus will be on addressing water quality through

community level initiatives such as '**household level water treatment**' and through **water safety planning** to ensure targeted funding towards improving critical water systems.

A major constraint to the expansion of the water and health surveillance monitoring program has been the lack of MoH laboratory and staffing capacity. The Sector intends to address this during the tenure of this Sector Plan through upgrading of laboratory facilities, training and capacity building.

Flood Mitigation

Flood mitigation measures to reduce incidence of flooding in the urban area will remain the priority for the sub Sector and will be addressed through a range of 'hard' measures (infrastructure improvements) and 'soft' measures which will include strengthening the enabling environment, building the capacity of the key implementing agencies, improving enforcement and strengthening of awareness programs to encourage stakeholder participation in the care of public drains and river channels.

Climate change

Cyclone Evan in December 2012had a devastating impact on the economy of Samoa and on the health and livelihoods of affected communities. Climate modelling suggests an increase in climate variability and increased frequency of such extreme events. This Sector Plan, accordingly, has a greater focus on **climate change**, with **disaster management and preparedness** factored into all sub Sector planning. The Sector has established effective links with the Disaster Management Division of MNRE, who will take a lead role in resource mobilisation and coordination of response to future disasters.

APPENDIX

1. **Water and Sanitation Sector: Subsector Action Plans 2016-2020**
2. **Water and Sanitation Sector and Subsector Logical Frameworks 2016-2020**

WFL ESPO 1: Sector Governance and Orientation Strengthened							
Action Plan			**Timeframe**				
Ref	**Intermediate Outcomes**	**Actions**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**Responsible Agency**
1.1	Strengthened Sector Governance and Orientation through enhanced sector policy, strategy and planning frameworks	1.1.1 Review and implement a practical and coherent Sector framework for action 2016-2020	X	X	X	X	MNRE - WSCU
		1.1.2 Review and implement of the National Water Services Policy		Policy Reviewed	X	X	MNRE-WSCU. SWA. MWCSD, IWSA
		1.1.3 Review and Implement the MOU between SWA and IWSA	X	Mou updated and endorsed	X	X	MNRE-WSCU,SWA,IWSA
		1.1.4 Review and Implement the Sector Capacity Building Action Plan 2017-2020		Review	X	X	MNRE- WSCU, ALL Ias
		1.1.5 Follow up National Water, Sanitation and Hygiene Survey				X	MNRE-WSCU, Bureau of Statistics
		1.1.6 Facilitate integration of National Water and Sanitation Survey into the National Census undertaken every 5 years				X	MNRE-WSCU, Bureau of Statistics
1.2	Enhanced and sustainable financial mechanisms for sector investments	1.2.1 Annual review and update sector MTEF	X	X	X	X	MNRE-WSCU, MOF -BUDGET
		1.2.2 Mid-term review of the approved annual budget	X	X	X	X	MOF-BUDGET /MNRE WSCU
		1.2.3 Review and update long term investment plan for the sector	X	X	X	X	MNRE-WSCU, MOF- BUDGET
		1.2.4 Consolidate and submit the Disbursment Request Report to EU	X	X	X	X	MNRE-WSCU, MOF- AID
		1.2.5 Strengthen engagement with Development Partners	X	X	X	X	MOF-AID, MNRE-WSCU

1.3	Effective sector coordination mechanisms maintained	1.3.1 Coordinate meetings of the high level Ministerial Coordination Committee (MCC) as required from time to time	X	X	X	X	MNRE-WSCU
		1.3.2 Coordinate quarterly Joint Water Sector Steering Committee (JWSSC) meetings	X	X	X	X	MNRE-WSCU
		1.3.3 Undertake monthly Technical Steering Committee (TSC) meetings to monitor subsector progress and developments	X	X	X	X	MNRE-WSCU
		1.3.4 Ensure regular sub-sector committee meetings (bi-monthy/monthly) are held to coordinate programme implementation	X	X	X	X	MNRE-WSCU
1.4	Effective and robust performance monitoring systems operationalised and maintained	1.4.1 Collect performance data on a quarterly basis from IAs	X	X	X	X	MNRE-WSCU
		1.4.2 Issue quarterly reports on sector's progress towards achieving performance indicators to the JWSSC and MCC	X	X	X	X	MNRE-WSCU
		1.4.3 Undertake Joint Water and Sanitation Sector Annual Reviews	X	X	X	X	MNRE-WSCU
		1.4.4 Conduct Bi-annual Reviews of implementation progress of the WfL Sector Plan			X		MNRE-WSCU
		1.4.5 Implement evidence-based research to inform sector policy planning and to gauge external feedback on sector developments	X	X	X	X	MNRE-WSCU
		1.4.6 Publish Water & Sanitation Research /National Water Forum	X	X	X	X	MNRE-WSCU

1.5	Improved sector communication	1.5.1 Coordinate implementation of a Sector Communication Strategy	X	X	X	X	MNRE-WSCU
		1.5.2 Upgrade and improve quality of sector webpage in the MNRE website		X			MNRE-WSCU/IT
		1.5.3 Prepare and disseminate quarterly sector newsletters to all stakeholders including local communities	X	X	X	X	MNRE-WSCU
		1.5.4 Set up an information resource centre for key reports/documents in soft and hard copies		X			MNRE-WSCU
1.6	Improved sector disaster preparedness and management	1.6.1 Strengthen collaboration with the Disaster Management Division	X	X	X	X	MNRE-WSCU/DMO
		1.6.2 Review and implement the sector preparedness and response plans and operations manual		Review	X	X	MNRE-WSCU/DMO
		1.6.3 Conduct Disaster Risk Management Trainings for IAs based on the Sector Preparedness and Response Plans and Operations Manual		X	X	X	MNRE-WSCU/DMO
		1.6.4 Conduct bi-annual drills to prepare and familiarise Ias with expected coordination roles during an actual natural disaster		X		X	MNRE-DMO

WFL ESPO 2: ENHANCED WATER RESOURCES RESILIENCE FROM RIDGE TO REEF							
Action Plan			**Timeframe**				
Ref	**INTERMEDIATE OUTCOMES**	**Actions**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**Responsible Agency**
2.1	Strengthened watershed conservation and management	2.1.1 Formulate, implement and enforce watershed management plans and regulatory tools in key watershed areas sustaining water supplies;	X	X	X	X	MNRE- WRD/Legal/LMD
		2.1.2 Develop P3D models as a tool for implementation of Watershed Management Plans	X	X	X	X	MNRE (WRD, TS, FD WSCU), MESC, MOF MWCSD , SWA, IWS, EPC, NGOs.
		2.1.3 Establish critical watershed areas as reserves (community reserves, compensated land, demarcation etc.)	X	X	X	X	
		2.1.4 Rehabilitate riparian areas using both hard (river walls, fencing) and soft (replanting, bio-log filter) solutions	X	X	X	X	
		2.1.5 Improve and expand parameters (biological, chemical, ecological) of the River Ecosystem Health Monitoring Program (REHM)	X	X	X	X	MNRE-WRD/DEC

2.2	Improved knowledge and understanding of water resources	2.2.1 Expand and Maintain the National Hydrometric Network (Surface and groundwater)	X	X	X	X	MNRE-WRD/MET/LM, SWA, SLC
		2.2.2 Upgrade National Hydrometric network and communication capability and information management systems (Telemetry)	X	X	X	X	MNRE-WRD/MET/LM, SWA, SLC
		2.2.3 Improve water related hazard (flood/ drought) monitoring and information to inform warning and adaptation.	X	X	X	X	MNRE- WRD/ MET/ DMO
		2.2.4 Strengthen water resource quality monitoring	X	X	X	X	SWA, IWS, EPC
		2.2.5 Data analysis and reporting on surface and ground water information (Hydrometric map, surface flow, groundwater profiling etc.)	X	X	X	X	SWA, IWS, EPC, MET, WRD
		2.2.6 Develop Water Environmental Guidelines			X	X	MNRE-WRD/DEC/PUMA/LEGAL , MOH, SROS

		2.2.7 Address capacity building needs for water resources in policy, hydrology and watershed management (Twinning arrangement, Training needs)	X	X	X	X	MNRE- WRD/WSCU/LEGAL PSC,MFAT
2.3	Strengthened legal and policy frameworks for water resources management	2.3.1 Implement and enforce the National Water Resources Policy, Water Resource Management Act, regulations and village bylaws.	X	X	X	X	MNRE - (WRD, Legal /PUMA, WSCU) MWCSD, SWA, IWSA, EPC, OAG
		2.3.2 Review and implement the National Water Resources Master Plan	X	X	X	X	
		2.3.3 Ongoing administration of the Water Abstraction Licensing Scheme	X	X	X	X	
		2.3.4 Provide secretariat functions to the Water Resources Technical Committee and Water Resources Management Board;	X	X	X	X	
		2.3.5 Ongoing monitoring and evaluation of policies and plans	X		X		
2.4	Robust and sustainable Stakeholders Partnership	2.4.1 Develop new partnerships with NGOs/CSOs (MoU)	X	X	X	X	MNRE–WRD

2.5	Community skills and confidence built	2.5.1 Develop a pilot for Payments for Ecosystem Services in relevant watershed areas		X		X	MNRE-LMD (SMSMCL Project)
		2.5.2 Conduct effective awareness and educational programmes	X	X	X	X	MNRE- WRD
		2.5.3 Promote and strengthen community driven watershed conservation and rehabilitation	X	X	X	X	MNRE- WRD

WFL ESPO 3: INCREASED ACCESS AND IMPROVED PROVISION OF RELIABLE, CLEAN AND AFFORDABLE WATER SUPPLY							
Action Plan			Timeframe				
Ref	**INTERMEDIATE OUTCOMES**	**Actions**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**Responsible Agency**
3.1	Water supply coverage increased	3.1.1 Construct SE Upolu Regional WS	X	X	X	X	SWA
		3.1.2. Construct Manono WS		X	X	X	SWA
		3.1.3. Construct piped networks for Vailele and Aleisa service areas	X	X	X	X	SWA
		3.1.4. Construct treatment facilities and new piped networks for untreated systems on Apia outskirts	X	X	X	X	SWA
		3.1.5. Alternative source works for drought protection	X	X	X	X	SWA
		3.1.6. Construct Moamoa 2nd sub-division WS	X	X			SWA
		3.1.7. Construct Faleasiu Uta WS to developing area	X	X			SWA
		3.1.8. Extension of Mulifanua piped network	X	X			SWA
		3.1.9 Upgrade of 10 Independent Water Schemes	X	X	X	X	IWSA
3.2	Non Revenue Water reduced	3.2.1 Comprehensive pipe network improvements and pipe replacement program to reduce NRW	X	X	X	X	SWA
		3.2.2. Meter installation, replacement and relocation program including additional submains	X	X	X	X	SWA
		3.2.3. Further NRW reduction programs for Savaii, Rural and Urban Schemes with major emphasis placed on leak detection and pressure management	X	X	X	X	SWA
		3.2.4. Maintain up to date and accurate customer database with digitised customer location on GIS	X	X	X	X	SWA
		3.2.5. Implementation of 'smart' water network technologies (SCADA, smart meters)	X	X	X	X	SWA

3.3	Drinking Water Quality Improved	3.3.1 Improvement of chlorination facilities at Rural and Urban rapid sand WTPs	X	X	X	X	SWA
		3.3.2. Phased establishment of chlorination facilities at all remaining SWA borehole sources	X	X	X	X	SWA
		3.3.3. Rehabilitate roughing and slow sand filters at all WTPs	X	X	X	X	SWA
		3.3.4. Rehabilitate Malololelei, Alaoa, Fuluasou and Faleata WTPs including replacement of valves/fittings/fencing/building	X	X	X	X	SWA
		3.3.5. Prepare 11 SWA drinking water safety plans & 24 IWS water safety plans	2 SWA 4 IWS	3 SWA 4 IWS	2 SWA 4 IWS	4 SWA 4 IWS	SWA, IWSA, MWCSD, MOH, MNRE
		3.3.6 Measure progress of IWS towards achieving NDWQS through the use of the tiered water quality scale	X	X	X	X	IWSA, MOH
3.4	Financial Sustainability enhanced	3.4.1. Review and implementation of WS tariff structure and levels, fees and charges	X			X	SWA, MOF
		3.4.2. Update of Asset Register and re-evaluation of all system and non-system assets	X	X	X	X	SWA
		3.4.3. Improve billing systems and reduce level of non-payment/outstanding debtors	X	X	X	X	SWA
		3.4.4 Increase number of IWS collecting fees for maintenance on a regular basis	X	X	X	X	IWSA, MWCSD
		3.4.5 Establishment of the Asset Management Registry for IWS		X	X	X	IWSA, MWCSD
3.5	Customer / Community satisfaction and knowledge increased	3.5.1. Improve Call Centre data collection, communication and reporting	X	X	X	X	SWA
		3.5.2 Increase awareness of issues and concerns through media coverage	X	X	X	X	SWA
		3.5.3. Implement awareness programs and activities at priority schools.	X	X	X	X	SWA
		3.5.4. Establish closer relationship with village committees in collaboration with MWCSD to provide forum for awareness raising, consultation and understanding of community needs	X	X	X	X	ISWA, MWCSD
		3.5.5 Enforce Water Schemes Act 2015	X	X	X	X	IWSA, MWCSD

		3.5.6 Increase communities capacity on Climate Resilience methods on climate proofing their water schemes.	X	X	X	X	IWSA
3.6	Organisational capacity enhanced with staff knowledge and skills built and improved office facilities	3.6.1 Rehabilitation of Vaitele Compound and office facilities with the establishment of new SWA headquarters		X			SWA
		3.6.2 Implement capacity building and twinning arrangements to enhance SWA/ IWSA Operational performance	X	X	X	X	SWA, IWSA/ MWCSD
		3.6.3. Procure operational equipment for increased performance	X	X	X	X	SWA, IWSA/ MWCSD
3.7	Rainwater harvesting promoted and implemented for the most vulnerable households	3.7.1 Rainwater harvesting promoted as a climate change adaptation method for most vulnerable areas.	X	X	X	X	SRC, MWCSD, MOH, MESC,
		3.7.2 Identify and assess households that are reliant on rainwater harvesting as their primary source of water	X	X	X	X	SRC, MWCSD, MOH, WSCU ,
		3.7.3 Conduct Monitoring & Evaluation of households targeted under the rainwater harvesting initiative	X	X	X	X	SRC, SWA, IWSA, MWCSD, MNRE-WSCU,
		3.7.4 Conduct annual training programs for improved hygiene linked to health	X	X	X	X	SRC, MWCSD, MNRE-WSCU, CSSP
3.8	Quality of Plumbing Services improved	3.8.1 Enforce the PAS Regulation 2016 by registration of all active plumbers	X	X	X	X	PAS
		3.8.2 Qualified service providers certified and licensed in line with approved plumbing standards/guidelines	X	X	X	X	PAS, SWA, IWSA, MWTI, Industries
		3.8.3 Implement plumbing standards	X	X	X	X	PAS
		3.8.4 Improve quality of plumbing services	X	X	X	X	PAS, NUS, GoS

WFL ESPO 4: SURVEILLANCE OF DRINKING WATER QUALITY AND WATER-BORNE DISEASES IMPROVED							
Action Plan			Timeframe				
Ref	Intermediate Outcomes	Actions	2016/17	2017/18	2018/19	2019/20	Responsible Agency
4.1	Improved drinking water quality surveillance	4.1.1 Review and update the National Drinking Water Standards 2008	X				MOH-NSIHRD
		4.1.2 Finalise and implement Guidelines for Updated Drinking Water Quality Standards.	X	X	X	X	MOH-NSIHRD
		4.1.3 Monitor implementation of water safety plans	X	X	X	X	M0H-NSIHRD, SWA, IWS, MNRE-WRD
		4.1.4 Ongoing Monitoring of water service providers	X	X	X	X	MOH-NSIHRD, SROS
		4.1.5 Conduct bi-annual audits of the water safety planning process		X		X	MOH-NSIHRD
		4.1.6 International accreditation of drinking water quality tests every 2 years		X		X	MOH-NSIHRD
		4.1.7 Formalise certification process for compliant bottled water companies.	X	X	X	X	MOH-NSIHRD
		4.1.8 Procure and install water treatment system for all health centres (urban and rural)	X	X	X	X	MOH-NSIHRD

4.2	Improved monitoring and reporting of prevalence of water -borne diseases	4.2.1 Regular collections and reporting of syndromic surveillance data on water borne diseases	X	X	X	X	MOH-NSIHRD
		4.2.2 Circulate monthly surveillance bulletins on water borne diseases to sector stakeholders	X	X	X	X	MOH-NSIHRD
		4.2.3 Circulate Alert Reports to relevant Authorities when diarrhoea and typhoid exceed threshold level	X	X	X	X	MOH-NSIHRD
		4.2.4 Map out prevalence of all water related diseases.	X	X	X	X	MOH - NSIHRD, MNRE-TS
		4.2.5 Procure the Water and Sanitation Mobile Truck for monitoring and testing.				X	MOH-NSIHRD, MNRE-WSCU, MOF
4.3	Strengthened legal and policy frameworks for drinking water quality	4.3.1 Enforce all provisions of the updated National Drinking Water Standards		X	X	X	MOH-NSIHRD
		4.3.2 Enforce provisions of the Food Act 2015		X	X	X	MOH-NSIHRD
4.4	Enhanced the Organisational Capacity of MOH to improve monitoring of drinking water quality and health surveillance of water-borne diseases	4.4.1 Upgrade the Water Quality Laboratory			X		MOH-NSIHRD
		4.4.2 Recruit qualified staff for drinking water monitoring and health surveillance		X	X		MOH-NSIHRD
		4.4.3 Upgrade knowledge and skills of staff on auditing water safety plans through trainings and professional development.		X			MOH-NSIHRD

		4.4.4 Upgrade public health officials knowledge and competencies on epidemiology		X			MOH-NSIHRD
		4.4.5 Capacity building of staff on Health Climate Early Warning System (H-CLEWS) to detect water related outbreaks.		X	X	X	MOH-NSIHRD, DMO, MET
4.5	Increased public awareness on water quality issues	4.5.1 Design and implement targeted awareness and educational programs on drinking water quality issues through media and other IEC materials	X	X	X	X	MOH-NSIHRD
		4.5.2 Conduct effective awareness programmes on the updated NDWS and Food Act 2015	X	X	X	X	MOH-NSIHRD
4.6	Strengthened Stakeholder partnerships	4.6.1 Strengthen coordination and information sharing between MOH, IWS, MNRE and MOH as per MOU	X	X	X	X	MOH-NSIHRD
		4.6.2 Engage SWA, IWSA and MNRE continually through subsector committee bi-monthly meetings	X	X	X	X	MOH-NSHIRD SWA, IWSA, MWCSD, MNRE-WSCU/WRD

WFL ESPO 5: Increased access to improved basic sanitation, hygiene practices and wastewater management systems							
Action Plan			Timeframe				
Ref	Intermediate Outcomes	Actions	2016/17	2017/18	2018/19	2019/20	Responsible Agency
5.1	Improved access to basic sanitation	5.1.1. Provide subsidized support targeting the improvement of septic tank for low income households living within/nearby critical environment in reticulated water supply areas			X	X	MNRE-PUMA, MOH-NSIHRD, MWTI-AMB
		5.1.2.Provide subsidized support targeting the improvement of septic tank for low income and vulnerable households reliant on open privies and in rain water harvesting locations			X	X	SRC, MNRE-PUMA, MOH-NSIHRD, MWTI-AMB, IWS, SRCS
		5.1.3. Improve on current onsite wastewater technologies such as biogas system designs and available waterless technologies	X	X	X	X	MNRE-PUMA/ RENEWABLE ENERGY/ DEC
		5.1.4. Identify alternative cost-effective onsite wastewater systems for community and hotel use	X	X	X	X	MNRE- PUMA/ RED/DEC, STA, MWTI-AMB

5.2	Effective implementation of nationwide education and awareness campaigns on sanitation and wastewater management	5.2.1. Plan, Coordinate and Implement awareness programmes for targeted groups/communities on good hygiene practises, improved sanitation facilities/wastewater systems, national building code i.e. video documentaries, brochure, consultations etc	X	X	X	X	MNRE-PUMA/RED/DEC, MOH-NSIHRD, MWTI-AMB, MWCSD – DFIA/DFW, IWSA, SRC, PAS, STA, SWA- WWD
		5.2.2. Strengthen collaboration with local service providers through the PPP Initiative to increase understanding on existing sanitation related policies, legislations, regulations and standards	X	X	X	X	MNRE-PUMA/RED/DEC, MOH-NSIHRD, MWTI-AMB, MWCSD – DFIA/DFW, IWSA, SRC, PAS, STA, SWA- WWD
		5.2.3. Target the ANM programme to increase public awareness on sustainable sanitation and waster systems, standard plans and utilize as a tool for data collection nationwide	X	X	X	X	MNRE-PUMA/RED/DEC, MOH-NSIHRD, MWTI-AMB, MWCSD – DFIA/DFW, IWSA, SRC, PAS, STA, SWA- WWD
		5.2.4. Strengthen political advocacy related issues through the SPAGL as a mechanism to promote public health and safe environment	X	X	X	X	MOH-NSIHRD
		5.2.5. Annual Commemoration of the World Sanitation Day	X	X	X	X	MNRE-PUMA/DEC,/RED/WSCU, MOH-NSIHRD, MWTI-AMB, MWCSD – DFIA/DFW, IWSA, SRC, PAS, STA, SWA-

							WWD
5.3	Strengthened legal, regulatory, policy framework and compliance	5.3.1. Implement Sanitation MOU to guide programme implementation, coordination monitoring of critical sanitation and wastewater issues that may arise	X	X	X	X	MNRE-PUMA, MOH-NSIHRD, MWTI-AMB
		5.3.2. Enforce and update the approved Code of Environmental Practise for Odour control	X	X	X	X	MNRE-PUMA, SWA-WWD
		5.3.3. Develop and Implement the National Effluent Standard and Annual Monitoring Programme	Standard Developed	X	X	X	MNRE- PUMA
		5.3.4. Develop a system to share and manage all sanitation and wastewater information/data		X	X	X	MNRE-PUMA
		5.3.5. Enforce and monitor (via annual reviews) the National Sanitation Guidelines for school sanitary facilities and public toilets	X	X	X	X	MOH-NSIHRD, MWTI-AMB, MNRE-PUMA/DEC
		5.3.6. Review the National Sanitation Policy		X	X	X	MNRE-PUMA
		5.3.7. Develop a Regulation on collection, transportation, use, disposal and treatment of wastewater sludge		X	X	X	MNRE-DEC/ LEGAL

		5.3.8. Develop and Implement Standard/Guideline for Sanitation & Wastewater Systems Design applicable to various environmental settings	X	X	X	X	MNRE-PUMA/DEC,/RED, MOH-NSIHRD, MWTI-AMB, MWCSD – DFIA/DFW, IWSA, SRC, PAS, STA, SWA-WWD
5.4	Improved knowledge and capacity of the Sanitation Subsector IAs	5.4.1. Conduct annual Apia Urban Sanitation Surveys to assess level of compliance with 2010-2016 urban sanitation surveys as baseline	X	X	X	X	MNRE-PUMA
		5.4.2. Conduct assessments to determine level of contamination from sanitation and wastewater systems at selected locations	X	X			MNRE-PUMA
		5.4.3. Establish Twinning Arrangement with recognised Institutions to address human resources development where relevant	X				MNRE-PUMA/DEC/RED, MOH-NSIHRD, MWTI- AMB, SWA-WWD, PAS, STA
5.5	Sustainable wastewater and sanitation infrastructures developed and maintained	5.5.1. Construct new public toilets where feasible and upgrade existing public toilets facilities at the Flea Market in Savalalo and Malaefatu ground	X	X	X	X	MNRE-DEC
		5.5.2. Identify suitable locations for two additional sludge disposal facilities and continue to monitor and maintain sludge facilities at Tafaigata and Vaiaata			X	X	MNRE-DEC

		5.5.3. Conduct regular health and environmental monitoring of sludge treatment facilities and public toilets maintenance and operations	X	X	X	X	MNRE-DEC
		5.5.4. Update and Maintain the existing sewage network model	X	X			SWA-WWD
		5.5.5. Connect remaining commercial properties within the existing service areas to the WWTP	X	X	X	X	SWA-WWD
		5.5.6. Reduce ingress of storm water to sewer network		X	X	X	SWA-WWD
		5.5.7. Upgrade wastewater facilities	X	X	X	X	SWA-WWD
		5.5.8. Construct 12 Garden Toilets at selected locations	X	X	X	X	MNRE- WSCU, STA

WFL ESPO 6: Strengthened flood mitigation measures to reduce incidence and magnitude of flooding in the CBD.							
Action Plan			Timeframe				
Ref	Strategy	Actions	2016/17	2017/18	2018/19	2019/20	Responsible Agency
6.1	Strengthened enabling environment for flood mitigation intiatives through effective policy and legal frameworks	6.1.1 Finalise and endorse MoU		X			MWTI-LTD, LTA-PPD, MNRE-WRD/PUMA, Drains Committee
		6.1.2 Develop Flood Mitigation Policy		X			MWTI-LTD, MNRE-PUMA
		6.1.3 Review Ministry of Works Act 2002 and Public Drains Regulations 2007		X			MWTI-LTD
		6.1.4 Develop a Drainage Design Manual			X		LTA
		6.1.5 Review and Update the (Road) and Drainage Standards		X			MWTI-LTD, LTA
		6.1.6 Develop discharge / run-off standards for the drainage system to prevent drainage problems like blockages as a result of debris and oil (from restaurants)		X			MNRE-PUMA, MWTI-LTD
		6.1.7 Develop a Drainage Masterplan		X	X	X	MWTI-LTD, MNRE-PUMA, LTA
6.2	Flooding incidences within the CBD mitigated	6.2.1 Undertake routine maintenance of the drainage network within specified zones – Drainage network within CBD	X	X	X	X	LTA-PPD / Drains Committee
		6.2.2 Expand the perimeter for routine maintenance of the drainage network to other suburban outskirts of the CBD		X	X	X	LTA-PPD / Drains Committee
		6.2.3 Prepare detailed designs for drainage upgrade within the CBD	X				LTA-PPD
		6.2.4 Construct drainage upgrades	X	X	X		LTA-PPD
		6.2.5 Update the Asset Management System/Database for all existing and newly constructed drainage infrastructure	X	X	X	X	LTA-PPD
		6.2.6 Update existing Drainage Network Mapping	X	X	X	X	LTA-PPD

6.3	Enhanced capacity of the Flood Mitigation Subsector Ias	6.3.1 Recruit qualified staff		X			MWTI-LTD, LTA-PPD
		6.3.2 Encourage the facilitation of Stakeholder Trainings and Workshop Meetings on how to better monitor and upgrade public drains within the vicinity of the AUA	X	X	X	X	MWTI-LTD, LTA-PPD
6.4	Increased public awareness targeting communities with direct impact on the Drainage Network	6.4.1 Implement community drains programme for priority communities		X	X	X	MWTI-LTD, LTA-PPD, MNRE-WRD/PUMA/DEC, Drains Committee, MWCSD
		6.4.2 Design and implement a TV Campaign to encourage a 'no pollution' and 'no rubbish' policy in targeted river and drainage systems	X	X	X	X	MWTI-LTD, LTA-PPD, MNRE-WRD/PUMA/DEC, Drains Committee, MWCSD
		6.4.3 Erect signage to warn people not to dump solids and liquids in targeted river and drainage systems	X	X	X	X	MWTI-LTD, LTA-PPD, MNRE-WRD/PUMA/DEC, Drains Committee, MWCSD
		6.4.4 Produce TV Spots to further inform the public of the existing Regulations covering offences and illegal activities affecting public drains.	X	X	X	X	MWTI-LTD, LTA-PPD, MNRE-WRD/PUMA/DEC, Drains Committee, MWCSD
6.5	Strengthened Stakeholder Partnerships and Collaboration	6.5.1 Carry out regular Subsector Meetings to document drainage upgrading works by key service providers and resolve drainage issues put forward by members	X	X	X	X	MWTI-LTD, LTA-PPD, MNRE-WRD/PUMA/DEC, Drains Committee, MWCSD
		6.5.2 Regulating bodies to strengthen enforcement of existing legislations to impose penalties on Offences and illegal practises affecting public drains	X	X	X	X	MWTI-LTD, MNRE-PUMA
		6.5.3 Subsector and Komiti o Alavai to carry out regular monitoring inspections of all public drains included in the CBD drainage network	X	X	X	X	MWTI-LTD, Drains Committee
		6.5.4 All subsector members to effectively monitor natural/public drains that are part of their jurisdictions to avoid drainage blockage and poor maintenance	X	X	X	X	MWTI-LTD, LTA-PPD, MNRE-WRD/PUMA/DEC, Drains Committee, MWCSD

WATER AND SANITATION SECTOR AND SUBSECTOR LOGICAL FRAMEWORKS 2016-2020

SECTOR	**WATER AND SANITATION SECTOR**					
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.**					
SUBSECTORS						
SECTOR GOVERNANCE AND ORIENTATION	**WATER RESOURCES MANAGEMENT**	**WATER SUPPLY**	**DRINKING WATER QUALITY**	**SANITATION**	**FLOOD MITIGATION-DRAINAGE**
END OF SECTOR PLAN OUTCOMES					
1. Sector Governance and Orientation Strengthened	***2. Enhanced water resources resilience from Ridge to Reef***	***3. Access to reliable, safe and sustainable water supply increased***	***4.Surveillance of drinking water quality and water-borne disease improved***	***5. Increased access to improved basic sanitation and hygiene practices, improved wastewater management systems***	***6. Strengthened flood mitigation measures to reduce incidence and magnitude of flooding in the CBD***
INTERMEDIATE OUTCOMES					
1.1 Strengthened Sector Governance and Orientation through enhanced sector policy, strategy and planning frameworks	2.1 Strengthened watershed conservation and management	3.1: Water supply coverage increased	4.1 Improved drinking water quality surveillance	5.1 Improved access to basic sanitation	6.1 Strengthened enabling environment for flood mitigation intiatives through effective policy and legal frameworks
1.2 Enhanced and sustainable financial mechanisms for sector investments	2.2 Improved knowledge and understanding of water resources	3.2 Non Revenue Water reduced	4.2 Improved monitoring and reporting of prevalence of water -borne diseases	5.2 Effective implementation of nationwide education and awareness campaigns on sanitation an wastewater management	6.2 Flooding incidences within the CBD mitigated
1.3 Effective sector coordination mechanisms maintained	2.3 Strengthened legal and policy frameworks for water resources management	3.3 Drinking Water Quality Improved	4.3 Strengthened legal and policy frameworks for drinking water quality	5.3 Strengthened legal, regulatory, policy framework and compliance	6.3 Enhanced capacity of the Flood Mitigation Subsector IAs
1.4 Effective and robust performance monitoring systems operationalised and maintained	2.4 Robust and sustainable Stakeholders Partnership	3.4 Financial Sustainability enhanced	4.4 Enhanced organisational capacity of MOH toimprove monitoring of water quality and surveillance of water borne diseases.	5.4 Improved knowledge and capacity of the Sanitation Subsector Ias	6.4 Increased public awareness targeting communities with direct impact on the Drainage Network
1.5 Improved sector communication	2.5 Community skills and confidence built	3.5 Customer / Community satisfaction and knowledge increased	4.5 Increased public awareness on water quality issues	5.5 Sustainable wastewater and sanitation infrastructures developed and maintained	6.5 Strengthened Stakeholder Partnerships and Collaborations
1.6 Improved sector disaster preparedness and management		3.6 Organisational capacity enhanced with staff knowledge and skills built and improved office facilities	4.6 Strengthened Stakeholder partnerships		
		3.7 Rainwater harvesting promoted and implemented for the most vulnerable households			
		3.8 Quality of Plumbing Services improved			

Subsector	Sector Governance and Orientation				
Long Term Outcome	Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.				
End of Sector Plan Outcome (ESPO) 1:	Sector Governance and Orientation Strengthened				
Intermediate Outcomes					
1.1 Strengthened Sector Governance and Orientation through enhanced sector policy, strategy and planning frameworks	***1.2 Enhanced and sustainable financial mechanisms for sector investments***	***1.3 Effective sector coordination mechanisms maintained***	***1.4 Effective and robust performance monitoring systems operationalised and maintained***	***1.5 Improved sector communication***	***1.6 Improved sector disaster preparedness and management***
Actions					
1.1.1 Review and implement a practical and coherent Sector framework for action 2016-2020	1.2.1 Annual review and update sector MTEF	1.3.1 Coordinate meetings of the high level Ministerial Coordination Committee (MCC) as required from time to time	1.4.1 Collect performance data on a quarterly basis from IAs	1.5.1 Coordinate implementation of a Sector Communication Strategy	1.6.1 Strengthen collaboration with the Disaster Management Division
1.1.2 Review and implement of the National Water Services Policy	1.2.2 Mid-term review of the approved annual budget	1.3.2 Coordinate quarterly Joint Water Sector Steering Committee (JWSSC) meetings	1.4.2 Issue quarterly reports on sector's progress towards achieving performance indicators to the JWSSC and MCC	1.5.2 Upgrade and improve quality of sector webpage in the MNRE website	1.6.2 Review and implement the sector preparedness and response plans and operations manual
1.1.3 Review and Implement the MOU between SWA and IWSA	1.2.3 Review and update long term investment plan for the sector	1.3.3 Undertake monthly Technical Steering Committee (TSC) meetings to monitor subsector progress and developments	1.4.3 Undertake Joint Water and Sanitation Sector Annual Reviews	1.5.3 Prepare and disseminate quarterly sector newsletters to all stakeholders including local communities	1.6.3 Conduct Disaster Risk Management Trainings for IAs based on the Sector Preparedness and Response Plans and Operations Manual
1.1.4 Review and Implement the Sector Capacity Building Action Plan 2017-2020	1.2.4 Consolidate and submit the Disbursment Request Report to EU	1.3.4 Ensure regular sub-sector committee meetings (bi-monthy/monthly) are held to coordinate programme implementation	1.4.4 Conduct Bi-annual Reviews of implementation progress of the WfL Sector Plan	1.5.4 Set up an information resource centre for key reports/documents in soft and hard copies	1.6.4 Conduct bi-annual drills to prepare and familiarise Ias with expected coordination roles during an actual natural disaster
1.1.5 Follow up National Water, Sanitation and Hygiene Survey	1.2.5 Strengthen engagement with Development Partners		1.4.5 Implement evidence-based research to inform sector policy planning and to gauge external feedback on sector developments		
1.1.6 Facilitate integration of National Water and Sanitation Survey into the National Census undertaken every 5 years			1.4.6 Publish Water & Sanitation Research /National Water Forum		

Subsector	**Water Resources Management**			
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.**			
End of Sector Plan Outcome (ESPO) 2:	**Enhanced Water Resources Resilience from Ridge to Reef**			
Intermediate Outcomes				
2.1 Strengthened watershed conservation and management	***2.2 Improved knowledge and understanding of water resources***	***2.3 Strengthened legal and policy frameworks for water resources management***	***2.4 Robust and sustainable Stakeholders Partnership***	***2.5 Community skills and confidence built***
Actions				
2.1.1 Formulate, implement and enforce watershed mar	2.2.1 Expand and Maintain the National Hydrometric Network (Surface and groundwater)	2.3.1 Implement and enforce the National Water Resources Policy, Water Resource Management Act, regulations and village bylaws.	2.4.1 Develop new partnerships with NGOs/CSOs (MoU)	2.5.1 Develop a pilot for Payments for Ecosystem Services in relevant watershed areas
2.1.2 Develop P3D models as a tool for implementation of Watershed Management Plans	2.2.2 Upgrade National Hydrometric network and communication capability and information management systems (Telemetry)	2.3.2 Review and implement the National Water Resources Master Plan		2.5.2 Conduct effective awareness and educational programmes
2.1.3 Establish critical watershed areas as reserves (community reserves, compensated land, demarcation etc.)	2.2.3 Improve water related hazard (flood/ drought) monitoring and information to inform warning and adaptation.	2.3.3 Ongoing administration of the Water Abstraction Licensing Scheme		2.5.3 Promote and strengthen community driven watershed conservation and rehabilitation
2.1.4 Rehabilitate riparian areas using both hard (river walls, fencing) and soft (replanting, bio-log filter) solutions	2.2.4 Strengthen water resource quality monitoring	2.3.4 Provide secretariat functions to the Water Resources Technical Committee and Water Resources Management Board;		
2.1.5 Improve and expand parameters (biological, chem	2.2.5 Data analysis and reporting on surface and ground water information (Hydrometric map, surface flow, groundwater profiling etc.)	2.3.5 Ongoing monitoring and evaluation of policies and plans		
	2.2.6 Develop Water Environmental Guidelines			
	2.2.7 Address capacity building needs for water resources in policy, hydrology and watershed management (Twinning arrangement, Training needs)			

Subsector	WATER SUPPLY						
Long Term Outcome	Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.						
End of Sector Plan Outcome (ESPO) 3:	Access to reliable, safe and sustainable water supply increased						
INTERMEDIATE OUTCOMES							
3.1: Water supply coverage increased	***3.2 Non Revenue Water reduced***	***3.3 Drinking Water Quality Improved***	***3.4 Financial Sustainability enhanced***	***3.5 Customer / Community satisfaction and knowledge increased***	***3.6 Organisational capacity enhanced with staff knowledge and skills built and improved office facilities***	***3.7 Rainwater harvesting promoted and implemented for the most vulnerable households***	***3.8 Quality of Plumbing Services improved***
ACTIONS							
3.1.1 Construct SE Upolu Regional WS	3.2.1 Comprehensive pipe network improvements and pipe replacement program to reduce NRW	3.3.1 Improvement of chlorination facilities at Rural and Urban rapid sand WTPs	3.4.1. Review and implementation of WS tariff structure and levels, fees and charges	3.5.1. Improve Call Centre data collection, communication and reporting	3.6.1 Rehabilitation of Vaitele Compound and office facilities with the establishment of new SWA headquarters	3.7.1 Rainwater harvesting promoted as a climate change adaptation method for most vulnerable areas.	3.8.1 Enforce the PAS Regulation 2016 by registration of all active plumbers
3.1.2. Construct Manono WS	3.2.2. Meter installation, replacement and relocation program including additional submains	3.3.2. Phased establishment of chlorination facilities at all remaining SWA borehole sources	3.4.2. Update of Asset Register and re-evaluation of all system and non-system assets	3.5.2 Increase awareness of issues and concerns through media coverage	3.6.2 Implement capacity building and twinning arrangements to enhance SWA/ IWSA Operational performance	3.7.2 Identify and assess households that are reliant on rainwater harvesting as their primary source of water	3.8.2 Qualified service providers certified and licensed in line with approved plumbing standards/guidelines
3.1.3. Construct piped networks for Vailele and Aleisa service areas	3.2.3. Further NRW reduction programs for Savaii, Rural and Urban Schemes with major emphasis placed on leak detection and pressure management	3.3.3. Rehabilitate roughing and slow sand filters at all WTPs	3.4.3. Improve billing systems and reduce level of non-payment/outstanding debtors	3.5.3. Implement awareness programs and activities at priority schools.	3.6.3. Procure operational equipment for increased performance	3.7.3 Conduct Monitoring & Evaluation of households targeted under the rainwater harvesting initiative	3.8.3 Implement plumbing standards
3.1.4. Construct treatment facilities and new piped networks for untreated systems on Apia outskirts	3.2.4. Maintain up to date and accurate customer database with digitised customer location on GIS	3.3.4. Rehabilitate Malololelei, Alaoa, Fuluasou and Faleata WTPs including replacement of valves/fittings/fencing/building	3.4.4 Increase number of IWS collecting fees for maintenance on a regular basis	3.5.4. Establish closer relationship with village committees in collaboration with MWCSD to provide forum for awareness raising, consultation and understanding of community needs		3.7.4 Conduct annual training programs for improved hygiene linked to health	3.8.4 Improve quality of plumbing services
3.1.5. Alternative source works for drought protection	3.2.5. Implementation of 'smart' water network technologies (SCADA, smart meters)	3.3.5. Prepare 11 SWA drinking water safety plans & 16 IWS water safety plans	3.4.5 Establishment of the Asset Management Registry for IWS	3.5.5 Enforce Water Schemes Act 2015			
3.1.6. Construct Moamoa 2nd sub-division WS		3.3.6 Measure progress of IWS towards achieving NDWQS through the use of the tiered water quality scale		3.5.6 Increase communities capacity on Climate Resilience methods on climate proofing their water schemes.			
3.1.7. Construct Faleasiu Uta WS to developing area							
3.1.8. Extension of Mulifanua piped network							
3.1.9 Upgrade of 10 Independent Water Schemes							

Subsector	Drinking Water Quality Subsector				
Long Term Outcome	Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.				
End of Sector Plan Outcome (ESPO) 4:	Surveillance of drinking water quality and water-borne disease improved				
Intermediate Outcomes					
4.1 Improved drinking water quality surveillance	***4.2 Improved monitoring and reporting of prevalence of water -borne diseases***	***4.3 Strengthened legal and policy frameworks for drinking water quality***	***4.4 Enhanced organisational capacity of MOH toimprove monitoring of water quality and surveillance of water borne diseases.***	***4.5 Increased public awareness on water quality issues***	***4.6 Strengthened Stakeholder partnerships***
Actions					
4.1.1 Review and update the National Drinking Water Standards 2008	4.2.1 Regular collections and reporting of syndromic surveillance data on water borne diseases	4.3.1 Enforce all provisions of the updated National Drinking Water Standards	4.4.1 Upgrade the Water Quality Laboratory	4.5.1 Design and implement targeted awareness and educational programs on drinking water quality issues through media and other IEC materials	4.6.1 Strengthen coordination and information sharing between MOH, IWS, MNRE and MOH as per MOU
4.1.2 Finalise and implement Guidelines for Updated Drinking Water Quality Standards.	4.2.2 Circulate monthly surveillance bulletins on water borne diseases to sector stakeholders	4.3.2 Enforce provisions of the Food Act 2015	4.4.2 Recruit qualified staff for drinking water monitoring and health surveillance	4.5.2 Conduct effective awareness programmes on the updated NDWS and Food Act 2015	4.6.2 Engage SWA, IWSA and MNRE continually through subsector committee bi-monthly meetings
4.1.3 Monitor implementation of water safety plans	4.2.3 Circulate Alert Reports to relevant Authorities when diarrhoea and typhoid exceed threshold level		4.4.3 Upgrade knowledge and skills of staff on auditing water safety plans through trainings and professional development.		
4.1.4 Ongoing Monitoring of water service providers	4.2.4 Map out prevalence of all water related diseases.		4.4.4 Upgrade public health officials knowledge and competencies on epidemiology		
4.1.5 Conduct bi-annual audits of the water safety planning process	4.2.5 Procure the Water and Sanitation Mobile Truck for monitoring and testing.		4.4.5 Capacity building of staff on Health Climate Early Warning System (H-CLEWS) to detect water related outbreaks.		
4.1.6 International accreditation of drinking water quality tests every 2 years					
4.1.7 Formalise certification process for compliant bottled water companies.					
4.1.8 Procure and install water treatment system for all health centres (urban and rural)					

Subsector	Sanitation			
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and alleviating poverty.**			
End of Sector Plan Outcome (ESPO) 5:	**Increased access to improved basic sanitation and hygiene practices, improved wastewater management systems**			
Intermediate Outcomes				
5.1 Improved access to basic sanitation	***5.2 Effective implementation of nationwide education and awareness campaigns on sanitation an wastewater management***	***5.3 Strengthened legal, regulatory, policy framework and compliance***	***5.4 Improved knowledge and capacity of the Sanitation Subsector las***	***5.5 Sustainable wastewater and sanitation infrastructures developed and maintained***
Actions				
5.1.1. Provide subsidized support targeting the improvement of septic tank for low income households living within/nearby critical environment in reticulated water supply areas	5.2.1. Plan, Coordinate and Implement awareness programmes for targeted groups/communities on good hygiene practises, improved sanitation facilities/wastewater systems, national building code i.e. video documentaries, brochure, consultations etc	5.3.1. Implement Sanitation MOU to guide programme implementation, coordination monitoring of critical sanitation and wastewater issues that may arise	5.4.1. Conduct annual Apia Urban Sanitation Surveys to assess level of compliance with 2010-2016 urban sanitation surveys as baseline	5.5.1. Construct new public toilets where feasible and upgrade existing public toilets facilities at the Flea Market in Savalalo and Malaefatu ground
5.1.2.Provide subsidized support targeting the improvement of septic tank for low income and vulnerable households reliant on open privies and in rain water harvesting locations	5.2.2. Strengthen collaboration with local service providers through the PPP Initiative to increase understanding on existing sanitation related policies, legislations, regulations and standards	5.3.2. Enforce and update the approved Code of Environmental Practise for Odour control	5.4.2. Conduct assessments to determine level of contamination from sanitation and wastewater systems at selected locations	5.5.2. Identify suitable locations for two additional sludge disposal facilities and continue to monitor and maintain sludge facilities at Tafaigata and Vaiaata
5.1.3. Improve on current onsite wastewater technologies such as biogas system designs and available waterless technologies	5.2.3. Target the ANM programme to increase public awareness on sustainable sanitation and waster systems, standard plans and utilize as a tool for data collection nationwide	5.3.3. Develop and Implement the National Effluent Standard and Annual Monitoring Programme	5.4.3. Establish Twinning Arrangement with recognised Institutions to address human resources development where relevant	5.5.3. Conduct regular health and environmental monitoring of sludge treatment facilities and public toilets maintenance and operations
5.1.4. Identify alternative cost-effective onsite wastewater systems for community and hotel use	5.2.4. Strengthen political advocacy related issues through the SPAGL as a mechanism to promote public health and safe environment	5.3.4. Develop a system to share and manage all sanitation and wastewater information/data		5.5.4. Update and Maintain the existing sewage network model
	5.2.5. Annual Commemoration of the World Sanitation Day	5.3.5. Enforce and monitor (via annual reviews) the National Sanitation Guidelines for school sanitary facilities and public toilets		5.5.5. Connect remaining commercial properties within the existing service areas to the WWTP
		5.3.6. Review the National Sanitation Policy		5.5.6. Reduce ingress of storm water to sewer network
		5.3.7. Develop a Regulation on collection, transportation, use, disposal and treatment of wastewater sludge		5.5.7. Upgrade wastewater facilities
		5.3.8. Develop and Implement Standard/Guideline for Sanitation & Wastewater Systems Design applicable to various environmental settings		5.5.8. Construct 12 Garden Toilets at selected locations

Subsector	Flood Mitigation- Drainage			
Long Term Outcome	**Reliable, clean, affordable water and improved sanitation within the Framework of Integrated Water Resources Management, for a resilient Samoa, sustaining health and**			
End of Sector Plan Outcome (ESPO) 6:	**Strengthened flood mitigation measures to reduce incidence and magnitude of flooding in the CBD**			
Intermediate Outcomes				
6.1 Strengthened enabling environment for flood mitigation intiatives through effective policy and legal frameworks	***6.2 Flooding incidences within the CBD mitigated***	***6.3 Enhanced capacity of the Flood Mitigation Subsector IAs***	***6.4 Increased public awareness targeting communities with direct impact on the Drainage Network***	***6.5 Strengthened Stakeholder Partnerships and Collaborations***
Actions				
6.1.1 Finalise and endorse MoU	6.2.1 Undertake routine maintenance of the drainage network within specified zones – Drainage network within CBD	6.3.1 Recruit qualified staff	6.4.1 Implement community drains programme for priority communities	6.5.1 Carry out regular Subsector Meetings to document drainage upgrading works by key service providers and resolve drainage issues put forward by members
6.1.2 Develop Flood Mitigation Policy	6.2.2 Expand the perimeter for routine maintenance of the drainage network to other suburban outskirts of the CBD	6.3.2 Encourage the facilitation of Stakeholder Trainings and Workshop Meetings on how to better monitor and upgrade public drains within the vicinity of the AUA	6.4.2 Design and implement a TV Campaign to encourage a 'no pollution' and 'no rubbish' policy in targeted river and drainage systems	6.5.2 Regulating bodies to strengthen enforcement of existing legislations to impose penalties on Offences and illegal practises affecting public drains
6.1.3 Review Ministry of Works Act 2002 and Public Drains Regulations 2007	6.2.3 Prepare detailed designs for drainage upgrade within the CBD		6.4.3 Erect signage to warn people not to dump solids and liquids in targeted river and drainage systems	6.5.3 Subsector and Komiti o Alavai to carry out regular monitoring inspections of all public drains included in the CBD drainage network
6.1.4 Develop a Drainage Design Manual	6.2.4 Construct drainage upgrades		6.4.4 Produce TV Spots to further inform the public of the existing Regulations covering offences and illegal activities affecting public drains.	6.5.4 All subsector members to effectively monitor natural/public drains that are part of their jurisdictions to avoid drainage blockage and poor maintenance
6.1.5 Review and Update the (Road) and Drainage Standards	6.2.5 Update the Asset Management System/Database for all existing and newly constructed drainage infrastructure			
6.1.6 Develop discharge / run-off standards for the drainage system to prevent drainage problems like blockages as a result of debris and oil (from restaurants)	6.2.6 Update existing Drainage Network Mapping			
6.1.7 Develop a Drainage Masterplan				