

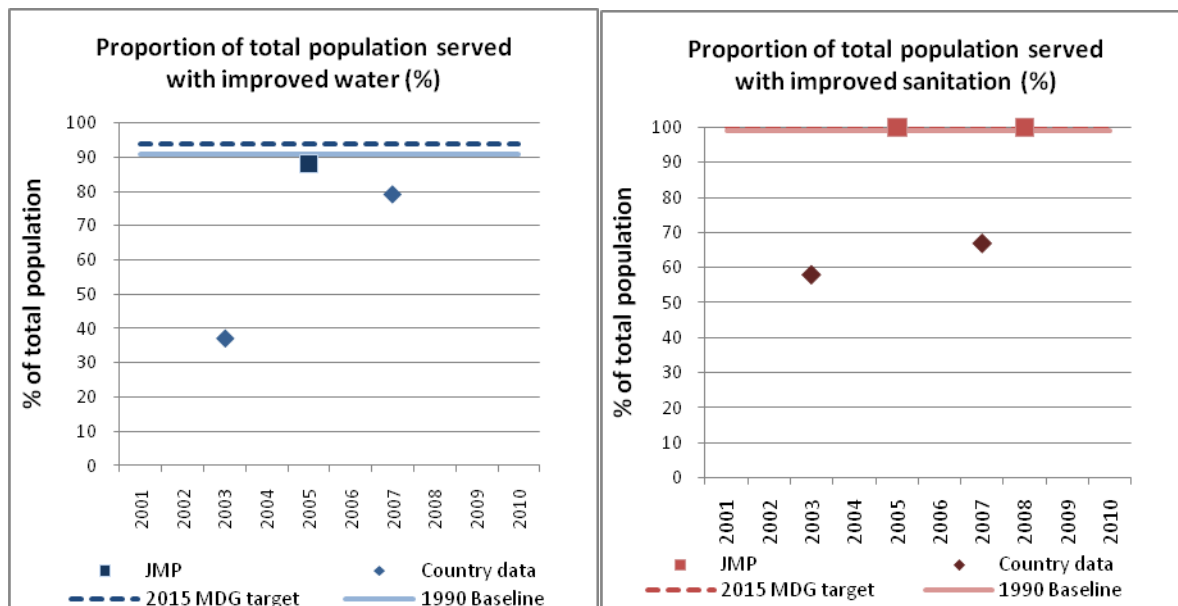
## Headline issues

- The government is prioritising improved water resource management over water supply infrastructure.
- Currently, the sector has a fragmented approach to management and protection of water resources and there is insufficient knowledge and understanding of water resources nationwide.
- The Samoan Water Authority is constrained by low capacity, aging infrastructure and insufficient financing to manage depreciation of aging rural water supply and sanitation infrastructure.
- There is no coherent approach to sanitation.

## Coverage and WASH related health statistics

Under the Millennium Development Goals (MDGs), Samoa’s targets for improved water and sanitation service coverage are 94% and 100% respectively. Based on the WHO-UNICEF Joint Monitoring Program’s (JMP) figures for 2008, Samoa has already met its sanitation target of universal coverage but is not on track to meet its water supply goal. A higher proportion of the population was without an improved water source in 2006 than in 1990 (see Figure 1).<sup>1</sup> There is significant variation between the JMP figures and those stated in the Government of Samoa’s Strategy for Samoa’s Development 2008-2012 in regards to both access to improved sanitation and improved water supply coverage.<sup>2</sup> There is a danger that the JMP’s universal sanitation figures may overstate actual service coverage and consequently discourage further investment in this subsector. In rural areas, ‘septic tanks’ are often used to describe any tank that receives toilet waste, but a 2004 study showed that only 17% of these tanks were true septic facilities, calling into question the accuracy of JMP data.<sup>2,3</sup>

Figure 1: Access to improved water and sanitation



Source: WHO/UNICEF Joint Monitoring Program (JMP) (2010) data for 2008<sup>1</sup> and Government of Samoa (GoS) 2008<sup>2</sup>

The current water treatment process is insufficient to cope with the increased particle loadings during the rainy season caused by high rates of deforestation in mountainous regions<sup>3</sup> and 15% of samples from treated supplies fail quality tests.<sup>2,4</sup> In 1999, work began to equip households in the capital, Apia, with water meters to begin to address major losses through leakage which is now just over 40% and is presumed to be even higher in rural areas.<sup>2,3,4</sup> Bottled water is increasing as a source of improved water for households and there are five companies bottling water in Samoa, four of these located on Upolu.<sup>5</sup>

Sanitation in Samoa is almost completely managed through individual septic systems. Approximately three quarters of households in Apia are connected to septic tanks, but many of these are overflowing and leaking black and grey water into groundwater or surface streams.<sup>5,6</sup> Sludge from Apia is deposited in two unlined pits outside of the town.<sup>5</sup> Outside of Apia, sludge is removed manually and dumped in forested areas.<sup>5</sup> Although the majority of households (73%) are reported to have flush toilets, many are not connected to a continuous piped water supply.<sup>2</sup> Other sanitation practices include pour-flush and pit latrines. Surveys show a deficiency in the quantity and quality of sanitation facilities (toilets and handwashing facilities) in schools and hospitals.<sup>2</sup> Samoa has limited industrial activity and industrial wastewater is self-regulated.<sup>2</sup>

WASH related health statistics indicate under-reporting and the need for progress in certain areas. The Ministry of Health links Samoa’s occasional outbreaks of typhoid with food contamination, in particular seafood collected near-shore, possibly caused by the dispersal of coastal villages’ untreated sewage.<sup>1,3,5</sup> Compared with other Pacific Island Countries, Samoa’s rate of infant mortality and WASH related DALYs (Table 1) are mid-range. However, statistics that record the number of people suffering the effects of waterborne disease are collected on presentation at medical facilities<sup>4,7</sup> and therefore are likely to under report the incidence of WASH related deaths and illness, including infant mortality.

**Table 1: Summary health statistics**

Infant mortality (deaths per 1000 births) <sup>8</sup>	25
WASH-related DALYs (% of all DALYs) <sup>9</sup>	5%
Total WASH related DALYs (Years) <sup>9</sup>	1,621
Total WASH related deaths per year <sup>10</sup>	54
WASH related proportion of deaths (%) <sup>10</sup>	4%

Sources: World Bank and WHO as shown in endnotes

## Finance trends

Financing needs, as identified in the government’s Water Sector Plan and Framework for Action, ‘Water for Life,’ are to initially underwrite infrastructure construction and later shift to rehabilitation.<sup>7</sup> Major investments in rural water supply and sanitation schemes were planned for 2008-2011 by the ADB and EU (see section on donor environment below).

Out of the total financing needs of the sector (which includes Water Resources, Water Use, Wastewater and Sector Orientation) the Water Use subsector has the highest need, the highest recurrent costs and the highest investment needs. The Water Use subsector also has the largest shortfall in recurrent funding (US\$865,000) for 2011/12.<sup>7</sup>

In 2006 the SWA’s income fell short of operating expenditure by 60% (\$US3.3M), with the difference met by government grants and subsidies.<sup>7</sup> It is the intention of the government that the SWA become financially autonomous by increasing water tariffs, improving collection rates from defaulters and independently assessing

asset depreciation, although the financial position of the SWA is declining.<sup>1</sup> The water tariff currently equates to approximately 2% of annual income for the majority of the population who earn less than US\$4,400 per annum.<sup>3,4,7</sup> Many people are unwilling to pay for water and regard it as a public good.<sup>7</sup> As income is insufficient to cover depreciation costs, all capital investment is reliant on external funding.<sup>7</sup>

## Sector governance

The country's key planning document, the *Strategy for the Development of Samoa (2008-2012)*, prioritises a shift towards a sector-wide approach to water use and wastewater.<sup>2</sup> This process was supported by the EU-funded Water Sector Support Programme (WSSP-2, 2005-2010).<sup>2</sup> In addition, SOPAC (Applied Geoscience and Technology Division of the Secretariat of the Pacific Community), launched its Sustainable Integrated Water Resources and Wastewater Management (IWRM) Project in Pacific Island Communities in Samoa. This program was designed to introduce concepts of IWRM into governance structures at the national and local level.<sup>4</sup>

The main government actor in the water services sector is the SWA, which is constrained by low capacity, aging infrastructure and insufficient financing.<sup>7</sup> The SWA is a wholly government owned utility operating under the Ministry of Works, Transport and Infrastructure (MWTI). It is nominally responsible for providing piped water supply and sanitation to all of Samoa and services 88% of the total population in urban and rural areas.<sup>2</sup> SWA also monitors their own water supplies and has a laboratory.<sup>7</sup>

There is no one single agency responsible for the water sector in Samoa. This brings challenges for sector coordination, although there is discussion of forming an apex body.<sup>2,7</sup> The Joint Water Sector Steering Committee (JWSSC) currently acts as an 'informal and interim' mechanism, directing overall sector policy and planning, and has final approval of projects. The JWSSC was responsible for the 'Water for Life' document which acts as the sector's overall plan and framework.<sup>7</sup> Samoa's two major water sector programs, the ADB-funded SSDB-2 and the EU-funded WSSP-2, both have technical steering committees that report directly to the JWSSC.

## Subsector governance

### Urban and rural sanitation

Sanitation is given a low priority in Samoa and there is no national authority or coherent policy that explicitly manages this subsector. Septic tanks in urban and rural areas are emptied by private-public cooperation but there is insufficient enforcement of standards for sludge disposal, posing a threat to water resources and public health.<sup>3</sup> There is no monitoring of effluent water quality and there are no comprehensive effluent water quality standards in place.<sup>2</sup> Since the inception of the ADB-funded SSDP, the SWA has also taken on projects in sanitation, sewerage, wastewater treatment services and sludge disposal facilities with no significant increase in its implementation capacity or institutional reform.<sup>7</sup>

### Urban Water

Apia, with a population of roughly 40,000 in 2010,<sup>11</sup> is dependent on surface water from the catchment area in the centre of Upolu Island and households are served by a combination of in-house and yard connections.<sup>5</sup> Urban households often receive un-treated water or inadequately treated water,<sup>2,7</sup> and it is estimated that 50% of customers of the Samoan Water Authority (SWA) *only* receive untreated water.<sup>4</sup> Households in low pressure zones (normally at the end points of distribution systems) can be without water for up to 12 hours a day.<sup>5</sup> Customers who do not receive a regular supply supplement town supply with unprotected spring water.<sup>2,3</sup>

Increased demand for water in rural areas serviced by piped supplies has reduced available water for Apia,<sup>3</sup> compounding existing supply challenges.

The private sector is involved in the water sector via two primary areas: bottled water production and septic tank sludge removal. Most companies are members of the Samoan Chamber of Commerce and Industry which has a seat on the JWSSC.<sup>7</sup>

### Rural Water

In rural communities where there is no access to piped water, the most common water supply is untreated groundwater and surface water sources where available.<sup>3</sup> Water quality in rural supply systems generally does not meet the (draft) national drinking water standards based on WHO guidelines.<sup>2</sup> Rainwater catchment systems are less common in Samoa than other Pacific Island Countries, and some communities have reportedly refused to use subsidised rainwater tanks citing a dislike for the taste.<sup>5</sup> The SWA has responsibility for providing water services in rural areas though coverage is patchy. SWA's water supply assets in rural areas are poorly maintained and degraded and users are reluctant to pay for the low levels of service they receive.<sup>7</sup> The EU funded WSSP is financing the rehabilitation of some of these schemes.<sup>7</sup>

Outside of these areas water is accessed through village-operated and independent schemes (15%) or small household scale sources.<sup>2,7</sup> The majority of village-operated or independent schemes were developed by the former Public Works Department and are now degraded, but the current operating committees do not collect sufficient income to rehabilitate them.<sup>7</sup> Most village schemes are run by the village water committee with the village mayor as chairperson.<sup>4</sup> The Independent Water Schemes Association was established in 2007 to manage and maintain independent and community water and sanitation schemes outside of SWA areas in conjunction with government and NGO partners.<sup>7</sup> This association has been supported by the EU-WSSP program since 2009, however information about its operation and effectiveness was not readily available for this review.

### Health and Hygiene

No information on hygiene or health promotion activities was accessible in the course of this review.

### Climate change and water resources

There has been a significant shift in government focus towards IWRM and improved water resources management, ensuring that Samoa's water resources are developed and maintained sustainably.<sup>12</sup> In a SOPAC hosted workshop participants identified three 'hot spots' or water resource zones in critical state. The Apia Catchment is suffering severe degradation in water quality and quantity, the Apia Coastal zone is under intense stress from eutrophication (possibly caused by untreated black and grey water and solid waste) and the Tafa'igata Aquifer is demonstrating a significant reduction in stream flow and quality.<sup>12</sup>

Climate change and sea level rise threatens bores with saltwater intrusion, although to date this has been limited to the northern and eastern parts of Savai'i.<sup>4</sup> The EU WSSP-2 has committed funds to investigating new pumping methods to reduce drawdown and saline intrusion and will also support programs in groundwater monitoring to build hydrological management capacity within MNRE's Water Resources Division.

Adaptation and coping strategies for climate change have been outlined in the Pacific Regional Action Plan for Sustainable Water Management.<sup>13</sup> Table 2 summarises climate change vulnerability indicators, which identify Samoa as highly vulnerable and acutely vulnerable in 2010 and 2030 respectively in terms of health impacts, agriculture and food security, weather disasters, habitat loss and economic stress.

**Table 2: Status of water resources and climate vulnerability**

Renewable water (ML/population) <sup>14</sup>	Not available
Overall Climate Vulnerability factor 2010 <sup>15</sup> (on scale of <i>Acute, Severe, High, Moderate, Low</i> )	High
Overall Climate Vulnerability Factor 2030 <sup>15</sup> (on scale of <i>Acute, Severe, High, Moderate, Low</i> )	Acute
Environmental Vulnerability Status <sup>16</sup> (on scale of <i>Extremely vulnerable, Highly vulnerable, Vulnerable, At risk, Resilient</i> )	Highly Vulnerable

## Donor environment

Compared to other Pacific Island Countries, there are few donors and international non-governmental organisations active in Samoa’s water supply and wastewater/sanitation sub sectors.<sup>4</sup> Almost all (97%) of the sector’s financing needs for 2008-12 had been secured largely based on the commitments of three major projects: the ADB funded *Samoa Sanitation and Drainage Program (SSDP-2)* (US\$22.9M), European Union funded *Water Sector Support Programme (WSSP-2)* (US\$35.7M USD) and GEF-funded *IWRM Planning and Programming* (US\$4M for 14 countries).<sup>7</sup>

The ADB is addressing sanitation through the second stage of a major drainage and wastewater management programme in Apia (SSDP-2) including a wastewater treatment works.<sup>17</sup> The first stage of this programme was completed in 2010 (financed by US\$10.8M in loans and US\$4.3M in international development assistance from the EU and ADB) and provided financing of flood mitigation in the capital and sealed septic tanks for 100 households.<sup>6, 17</sup>

Prior to this, the European Commission also played a key role through its Rural Water Supply Programme (RWSP) which was completed in 2003.<sup>3</sup> This US\$31.6M project focused on construction of water supply infrastructure in two of the most heavily populated areas, Upolu and Savai’i.<sup>3</sup>

The Government of Germany has been active in urban water supply, investing US\$1.4M in metering Apia’s water system.<sup>3</sup> AusAID and NZAID jointly funded the Public Sector Improvement Facility for Samoa (2005-08) which focused on water sector orientation.<sup>4</sup>

The Ministry of Finance established the Water Sector Management Unit (WSMU) to coordinate aid and all internal and external funding for the water sector. The WSMU reports to the JWSSC.<sup>7</sup>

## Sector monitoring

Monitoring and reporting has traditionally been done poorly in Samoa, thus progress of WASH programs in recent years takes time to be adequately reflected in readily available documentation.<sup>18</sup> Past monitoring attempts have been hampered by a lack of data and poor methods for data collection.<sup>7</sup> More recently, monitoring has been undertaken in parallel with the country’s two largest water projects (SSDP-2 and WSSP-2), utilising the respective donors’ indicators and reporting methods rather than a government-led system.

The ‘Water for Life’ sector plan identifies agencies responsible for monitoring subsectors but does not describe the indicators they are reporting against.<sup>7</sup> The Ministry of Natural Resources and Environment’s (MNRE’s) Water Resources Division is responsible for monitoring and evaluation of water quantity management and watershed management, and also supports the Ministry of Health in water quality monitoring and water safety management.<sup>7</sup> Similar to other government departments, the Ministry of Health lacks the resources and capacity to undertake this service, meaning that the actual level of water borne disease in the country is unknown.<sup>2</sup>

Monitoring and evaluation of urban and rural water supply and sanitation falls under the Ministry of Finance's State of Environment Monitoring Unit.<sup>4</sup> Access to sanitation is a key performance indicator for the government and is included in the Census. However, data collection methods are insufficient to identify whether sanitation facilities pose threats to public health and the environment and therefore cannot be used to monitor progress.<sup>4</sup>

### Acknowledgements

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<sup>1</sup> WHO / UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation <http://www.wssinfo.org/data-estimates/maps/>

<sup>2</sup> Government of Samoa (GoS) (2008a) Strategy for the Development of Samoa 2008–2012. Ministry of Finance, Economic Policy and Planning Division. Apia. May 2008. Available at: <http://www.sprep.org/att/IRC/eCOPIES/Countries/Samoa/104.pdf>

<sup>3</sup> PARTICIP GmbH (2006) Evaluation of the Water and Sanitation Sector – Final Synthesis Report - Volume 3. Evaluation for the European Commission. July 2006. Available at: <http://www.oecd.org/dataoecd/44/52/37678740.pdf?contentId=37678745>

<sup>4</sup> SOPAC (2007a) National Integrated Water Resource Management Diagnostic Report: Samoa. Draft SOPAC Miscellaneous Report 664. November 2007. Available at [www.pacificwater.org/pages.cfm/country-information/samoa.html](http://www.pacificwater.org/pages.cfm/country-information/samoa.html)

<sup>5</sup> Kingston, P. A. (2004) Surveillance of Drinking Water Quality in the Pacific Islands: Situation Analysis and Needs Assessment. County Reports. Available at: <http://www.wpro.who.int/NR/rdonlyres/EBBFCA6B-BC08-48A0-B4C5-5ECA02B6BD65/0/Samoa.pdf>

<sup>6</sup> Asian Development Bank (ADB) (2010) Asian Development Bank and Samoa: Fact Sheet. 31 December 2010. Available at: <http://www.adb.org/samoa/publications.asp>

<sup>7</sup> GoS (2008b) *Water for Life: Water Sector Plan and Framework for Action 2008/9 – 2011/12*. Final Draft.

<sup>8</sup> The probability per 1,000 that a newborn baby will die before reaching age five (2009). Source: World Bank Open Data from the Inter-agency Group for Child Mortality Estimation.

<sup>9</sup> Disability-adjusted life year (DALY) measures the years of life lost to premature mortality and the years lost to disability. Source: 2004 update of the Table 1 and Annex of the publication 'Safer water, better health', by Prüss-Ustün et al, WHO, Geneva, 2008. Available at [http://www.who.int/quantifying\\_ehimpacts/publications/saferwater/en/index.html](http://www.who.int/quantifying_ehimpacts/publications/saferwater/en/index.html).

<sup>10</sup> Source: 2004 update of the Table 1 and Annex of the publication 'Safer water, better health', by Prüss-Ustün et al., WHO, Geneva, 2008 as above.

<sup>11</sup> Geo Names database. Accessed 26 May 2011. Available at <http://www.geonames.org/search.html?q=apia&country=>

<sup>12</sup> SOPAC (2007b) Samoa Hot Spots Analysis and Demonstration Concept (IWRM) Final Report. March 2007. Available at <http://www.pacificwater.org/pages.cfm/country-information/samoa.html>

<sup>13</sup> Pacific Wash Coalition (2009) Framework for the Pacific WASH Coalition. From Planning meeting of the Pacific Wash Coalition. 16-17 February 2009.

<sup>14</sup> Renewable Freshwater Supply estimates (km<sup>3</sup>/yr) (2006) from Pacific Institute ([www.worldwater.org](http://www.worldwater.org)), converted to ML per head of population using JMP population estimates. Data should be used with caution and treated as 'order of magnitude'. Freshwater estimates (2006 updates) were made at different periods from different sources. 2008 JMP population data used for consistency with other calculations.

<sup>15</sup> Source: Climate Vulnerability Monitor 2010 <http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2010>. Countries are classified according to: ACUTE+, ACUTE, ACUTE-, SEVERE+, SEVERE, SEVERE-, HIGH+, HIGH, HIGH-, MODERATE, LOW. For information on included datasets and methodology for aggregation and categorising, see [http://daraint.org/wp-content/uploads/2010/12/CVM\\_Methodology.pdf](http://daraint.org/wp-content/uploads/2010/12/CVM_Methodology.pdf).

<sup>16</sup> Source: Environmental Vulnerability Index 2004 developed by SOPAC, UNEP and partners <http://www.vulnerabilityindex.net/>. Countries are classified according to: Extremely vulnerable, Highly vulnerable, Vulnerable, At risk, Resilient.

<sup>17</sup> Asian Development Bank (ADB) (2011) Development Effectiveness Brief: Samoa Building a More Resilient Economy. Available at <http://www.adb.org/samoa/publications.asp>

<sup>18</sup> Personal communication, Wrathall, M. Consultant. 24 June 2011.