

Environment Statistics

Water Accounts for Samoa, 2014 -15

Executive Summary

Samoa Water Account presents information on the physical supply and use of water in Samoa's economy. This second version of the account is compiled based on similar methodologies applied to the first version with some improvements on few areas of the account. For instance, an industry classification of water use from the 'aggregate' customer information of the major supplier, the Samoa Water Authority, was incorporated into the 2014-15 account. This enabled, for example, improved estimates for agricultural water use.

The account is compiled in accordance with the System of Environmental Economic Accounting (SEEA Framework). In **2014-15**, an estimated **115.01** million m³ of water was abstracted from the environment to support Samoa's economy (Figure 1). Of this amount, **79.58** million m³ (70.0%) was abstracted for own use and **35.43** million m³ (30.0%) for distribution to households and industries mainly by the two main water suppliers, namely Samoa Water Authority (SWA) and Independent Water Scheme (IWS). Electricity abstracted **75.25** million m³ of water mainly for hydro-electricity generation, a non-consumptive use.

Figure 1 shows a summary of the 2014-15 water account highlighting the flow of water from the environment to the economy, movement between the economic units and the water returns back to the environment. It is a simplified representation of the flows recorded in Physical Supply and Use Tables (PSUT) for 2014-15.

Total water consumption for 2014-15 was **23.04** million m³ of water, an increase of about **4.45** million m³ (20.0%) from 2013-14. Increases in water consumption by households, other industries, and agriculture contributed to the overall increase in water consumption for 2014-15. The majority of water consumption was consumed by households which accounted for **16.83** million m³ (73.0%) and the remaining **6.21** million m³ (27.0%) by all industries. **Table 1** summarizes the water consumption for the last five financial years 2011-12 to 2014-15.

Table 1: Summary of Samoa Water Consumption for 2011-12 to 2014-15

	Industries (by ISIC categories)							Households	Total
	Agriculture ¹	Manufacturing	Electricity	Water supply	Sewerage	Other industries	Total industry		
2011-12	2.10	0.85	0.09	0.72	0.18	1.53	5.47	13.66	19.13
2012-13	2.04	0.85	0.12	0.00	0.18	1.44	4.63	12.45	17.08
2013-14	2.00	0.85	0.09	-0.03	0.18	1.88	4.97	13.60	18.59
2014-15	3.11	0.71	0.01	0.00	0.19	2.19	6.21	16.83	23.04

¹Agriculture water consumption is for livestock only for 2011-12 to 2013-14 except for 2014-15. In 2014-15 water used in nurseries was added (this water was previously in "Other industries"). Important distinction if data used for comparison purposes.

Main Findings 2014-15

Physical Water Supply and Use

- Total water consumption by households in 2014-15 was 16.83 million m³, an increase of 3.23 million m³ (19.0%) from 13.60 million m³ in 2013-14.
- An estimated total volume of 115.01 million m³ was abstracted from the environment to support Samoa's economy. The bulk of water abstracted was mainly used by Hydropower generation for electricity production which accounted for 75.25 million m³ (65.4%) of total abstraction, a non-consumptive use. Water Suppliers abstracted 35.43 million m³ (30.8%) and the remaining 4.33 million m³ (3.8%) was abstracted directly by the users.
- Total water consumption decreased by 2.05 million m³ between 2011-12 and 2012-13 and increased by 5.96 million m³ from 2012-13 to 2014-15. The overall increase of water consumption was driven mainly by rises in household water consumption.

Partial Monetary Supply and Use Table

- Coverage of financial information was limited to the water supplied by two major water suppliers, the Samoa Water Authority (SWA) and the Independent Water Scheme (IWS). In 2014-15, the implicit price paid for water varied between water suppliers and sectors from \$SAT0.13/m³ for unmetered water supplied by IWS to \$SAT1.97/m³ for industries supplied by SWA.
- The bulk of estimated revenue generated was from household metered water supplied by Samoa Water Authority. In 2014-15 this was \$SAT9.4 million or 63% of total estimated revenue.
- There was an increase in the price per cubic meter across all supplied water from 2013-14 to 2014-15, however IWS unmetered remained the cheapest and SWA metered water supplied to industries the highest.

Table 2: Partial Monetary Supply and Use Table for 2013-14 to 2014-15

	Water Supplied (m ³)	Revenue (\$SAT)	Implicit Price (\$SAT/m ³)
2014-2015			
SWA metered industry	2,170,000	4,283,902.00	1.97
SWA metered households	7,310,000	9,433,148.00	1.29
SWA unmetered households ¹	1,400,000	761,404.00	0.54
IWS unmetered	3,504,403	439,200.00	0.13
Total	14,384,403	14,917,654.00	
2013-2014			
SWA metered industry	2,090,000	3,504,114.00	1.68
SWA metered households	6,290,000	7,457,882.00	1.19
SWA unmetered households ¹	1,890,000	673,087.00	0.36
IWS unmetered	6,880,000	283,000.00	0.04
Total	17,150,000	11,918,083.00	

¹All unmetered water assumed to be households

Changes in the Issue

This edition of the Water Account, Samoa 2014-15 features changes to some areas of the physical supply and use tables.

The improved information provided by SWA and abstraction licensing information from the Ministry of Natural Resources and Environment (MNRE) enabled further breakdown of industries. Manufacturing Industry was split into Food & Beverages and Other Manufacturing. All other industries were also split into Construction and Others.

The Independent Water Scheme household water use was estimated to be half the rate published in the previous account. According to the expert advice from IWS, the rate was four times the household average water use by SWA but it reduced down to two times due to improved system upgrade and strong awareness programme to counter wasteful practices of households.

Previously, Agriculture water use only accounted for the water use by livestock. For 2014-15, agricultural nursery sites and other agricultural water users were able to be identified through SWA 'aggregate' customer information.

The Red Cross also abstracted and purified an estimated 1,094 cubic meters of water after Cyclone Evan in 2012-13 (Dec '12 & Jan '13). Most of the water was supplied to households.¹ This water was not separately identified in the account for that year as, firstly, it was not clear if this water was included in previous estimates of unmetered water use by households and secondly, even if it was not, it was an unusual event and hence probably not reflective of overall trends.

Rainwater harvesting was also calculated using the information on water tanks and tanks capacities from Red Cross. These water tanks were mainly distributed to the areas where supplies of water (piped water) by the major suppliers are not available.

Wastewater from industries and government properties connected to the sewerage system was calculated and provided by SWA. The customer information from SWA for use of the services from the wastewater treatment plant was not able to estimate the industry split, but in the future this information should be available, and hence the accounts improved.

An expert advice from SWA mentioned that around 10% of wastewater is discharged back to the environment through evaporation, while the remaining 90% of water is in the sewerage sludge which is transported to landfill after treatment.

It is important to note these improvements in some of the estimates presented in the 2014-15 edition of the account. However, because of these improved estimates care must be taken in the interpretation of changes over time.

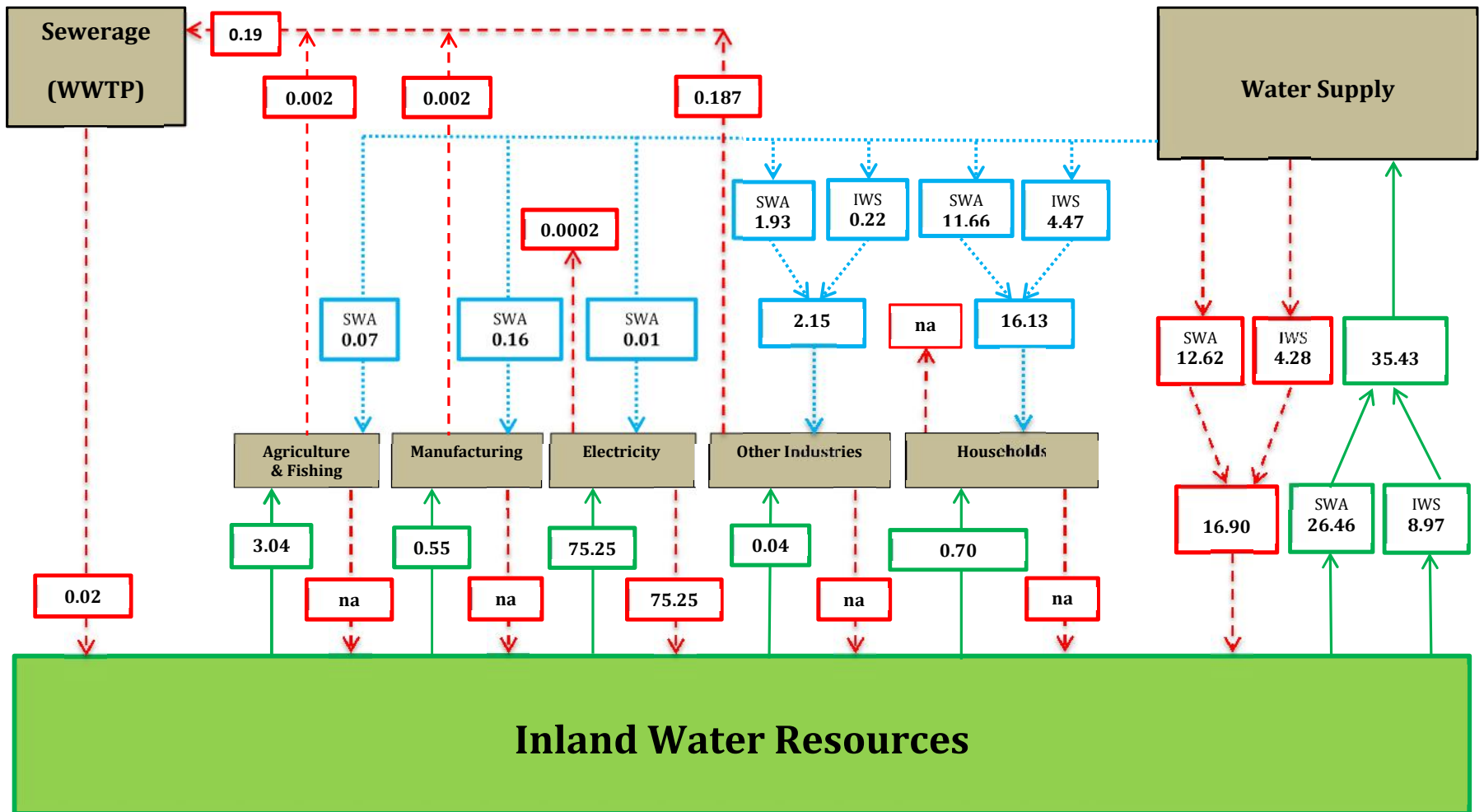
¹ Red Cross (Samoa Red Cross Society), MDG Project Reports 2012-13, 2013-2014 & 2014-15, Samoa Red Cross Society

Fig. 1: Major Water Flows in Samoa 2014-15 (millions m³)

Key: → Abstraction from the Environment

⋯→ Water from other economic unit

- - - → Wastewater



Note: Definition of Wastewater as frequently used throughout this document “is discarded water that is no longer required by the owner or user”.

1. Introduction

The initial Water Account published for the first time for Samoa, 2011-12 to 2014-15 was the first step towards the compilation of environmental accounts on a continuous basis. It also provided the opportunity to improve on the data collection for improved compilation of water accounts.

There are changes and improvements from the last version as described earlier but more improvements are possible and depend mainly on the availability of information from stakeholders.

2. Accounts Produced

Water Account 2014-15 was produced following the initial accounts produced for financial years 2011-12 to 2013-2014 (Table 4, Table 5 and Table 6). The 2014-15 PSUT (Table 3) has incorporated some improved information compare to the earlier financial periods.

Figure.1 shows the major water flows for 2014-15 and is a simplified representation of the flows recorded in the experimental physical supply and use table for 2014-15 (Table 3). Figures for the additional years are shown in the annex (Figs A1, A2 and A3).

2.1 Data Quality

The estimates presented in this report are based on a range of data sources and methods. There were several improvements in the data used in the compilation of the 2014-15 Account. These include:

- 'aggregate' customer use data by industries provided by SWA slightly based on Samoa Bureau of Statistics business registered provided to the authority;
- water use by hydroelectric power generation directly provided by Electric Power Corporation (EPC) instead of estimates calculated through certain methods in the previous accounts;
- new livestock numbers from the 2015 Agriculture Survey by SBS and water use information for livestock farm and nursery from SWA 'aggregate' customer use data;
- Red Cross data on water tanks distributed was used to estimate rainwater harvested; and
- updated water abstraction licensing information from MNRE used to estimate the abstraction by manufacturing and other industries.

More details on data sources and methods are presented in the following section (Section 3: Data sources and methods). The quality of the estimates varies between years and between industries (e.g. agriculture and water supply) and sectors (i.e. corporate, households and government).

Overall the quality of the accounts is medium. In this, the account shows general trends over time and the relativities between industries and sectors within years. **The information should be interpreted with care and with other available information and expert advice.**

With the new information made available for compilation of 2014-15 account, it is likely that the quality of the Water Account will be improved over time. All stakeholder and any other organization or person wishing to contribute to the improvement of methodologies and the account are encouraged to do so by contacting the Bureau.

Table 3: Physical Supply and Use Table for Samoa, 2014-15 (million m³)

Industries (ISIC)	Supply				Use					Consumption ¹
	Water to Other Eco. Activities	Total Returns		Total Supply	Abstraction		Total Abstraction	Water from Other Eco. Activities	Total Use	
		To Surface Water /Groundwater	To Other Sources		For Own Use	For Distribution				
Agriculture and Fishing	--	--	--	--	3.04	--	3.04	0.07	3.11	3.11
Manufacturing	--	--	--	--	0.55	--	0.55	0.16	0.71	0.71
- Food & Beverages	--	--	--	--	0.55	--	0.55	0.14	0.69	0.69
- Other Manufacturing	--	--	--	--	--	--	--	0.02	0.02	0.02
Electricity	--	75.25	--	75.25	75.25	--	75.25	0.01	75.26	0.01
Water Supply	18.53	16.90	--	35.43	--	35.43	35.43	--	35.43	0.00
Sewerage	--	--	--	--	--	--	--	0.19	0.19	0.19
Other Industries	--	--	--	--	0.04	--	0.04	2.15	2.19	2.19
- Construction	--	--	--	--	0.04	--	0.04	0.02	0.06	0.06
- Rest of Other Industries	--	--	--	--	--	--	--	2.13	2.13	2.13
Total All Industries ²	18.53	92.15	0.00	110.68	78.88	35.43	114.31	2.58	116.89	6.21
Final Consumption by Households	--	--	--	--	0.70	--	0.70	16.13	16.83	16.83
Total Supply and Use ³	18.53	92.15	0.00	110.68	79.58	35.43	115.01	18.71	133.72	23.04

Note: ¹ Consumption = Total Use – Total Supply;

² Total Industries = Agriculture + Manufacturing + Electricity + Water Supply + Sewerage + Other Industries (all industries by ISIC);

³ Total Supply and Use = Total Industries + Final Consumption by Households

Table 4: Physical Supply and Use Table for Samoa, 2013-14 (million m³)

Industries (ISIC)	Supply				Use					Consumption
	Water to Other Eco. Activities	Total Returns		Total Supply	Abstraction		Total Abstraction	Water from Other Eco. Activities	Total Use	
		To Surface Water /Groundwater	To Other Sources		For Own Use	For Distribution				
Agriculture and Fishing	--	--	--	--	2.00	--	2.00	--	2.00	2.00
Manufacturing	--	--	--	--	0.38	--	0.38	0.47	0.85	0.85
Electricity	--	71.70	--	71.70	71.70	--	71.70	0.09	75.26	0.09
Water Supply	15.55	31.37	--	46.92	--	46.89	46.89	--	46.89	-0.03
Sewerage	--	--	--	--	--	--	--	0.18	0.18	0.18
Other Industries	--	--	--	--	0.03	--	0.03	1.85	1.88	1.88
Total Industries	15.55	103.07	0.00	118.62	74.11	46.89	121.00	2.59	123.59	4.97
Final Consumption by Households	--	--	--	--	0.48	--	0.48	13.14	13.62	13.62
Total Supply and Use	15.55	103.07	0.00	118.62	74.59	46.89	121.48	15.73	137.21	18.59

Table 5: Physical Supply and Use Table for Samoa, 2012-13 (million m³)

Industries (ISIC)	Supply				Use					Consumption
	Water to Other Eco. Activities	Total Returns		Total Supply	Abstraction		Total Abstraction	Water from Other Eco. Activities	Total Use	
		To Surface Water / Groundwater	To Other Sources		For Own Use	For Distribution				
Agriculture and Fishing	--	--	--	--	2.04	--	2.00	--	2.04	2.04
Manufacturing	--	--	--	--	0.38	--	0.38	0.47	0.85	0.85
Electricity	--	85.46	--	85.46	85.46	--	85.46	0.12	85.58	0.12
Water Supply	14.00	34.64	--	48.64	--	48.64	48.64	--	46.64	0.00
Sewerage	--	--	--	--	--	--	--	0.18	0.18	0.18
Other Industries	--	--	--	--	0.03	--	0.03	1.41	1.44	1.84
Total Industries	14.00	120.10	0.00	134.10	87.91	48.64	136.55	2.18	138.73	4.63
Final Consumption by Households	--	--	--	--	0.45	--	0.45	12.00	12.45	12.45
Total Supply and Use	14.00	120.10	0.00	134.10	88.36	48.64	137.00	14.18	151.18	17.08

Table 6: Physical Supply and Use Table for Samoa, 2011-12 (million m³)

Industries (ISIC)	Supply				Use					Consumption
	Water to Other Eco. Activities	Total Returns		Total Supply	Abstraction		Total Abstraction	Water from Other Eco. Activities	Total Use	
		To Surface Water / Groundwater	To Other Sources		For Own Use	For Distribution				
Agriculture and Fishing	--	--	--	--	2.10	--	2.10	--	2.10	2.10
Manufacturing	--	--	--	--	0.38	--	0.38	0.47	0.85	0.85
Electricity	--	71.70	--	71.70	71.70	--	71.70	0.09	71.79	0.09
Water Supply	15.20	25.52	--	40.72	--	41.44	41.44	--	41.44	0.72
Sewerage	--	--	--	--	--	--	--	0.18	0.18	0.18
Other Industries	--	--	--	--	0.03	--	0.03	1.50	1.53	1.53
Total Industries	15.20	97.22	0.00	112.42	74.21	41.11	115.65	2.24	118.14	5.47
Final Consumption by Households	--	--	--	--	0.52	--	0.52	13.14	13.66	13.66
Total Supply and Use	15.20	97.22	0.00	112.42	74.73	41.44	116.17	15.38	131.18	19.13

3. Data Sources and Methods

A range of data sources and methods were used to produce the accounts. These are described below under the headings of water supply, agriculture, electricity, manufacturing, other industries and households.

Population estimates and average household size (7.1) from the 2011 Population and Housing Census 2011 (PHC, 2011) were used for a range of calculations as tabulated in Table 7.

Table 7: Estimated population and number of households, 2012 to 2015

	2012	2013	2014	2015
Population	189,236	190,652	192,067	19,3483
Estimated no. of households¹	26,653	26,852	27,052	27,251

¹Based on 7.1 people per household (PHC, SBS 2011)

The main sources of water in Samoa are surface and groundwater. There is a small amount of collection of rainwater by water tanks. While some information on water source was available, it was not sufficient to be included in the supply and use tables.

3.1 Water supply

The account calculated the amount of water abstracted from the environment, supplied to industries and households and returned back to the environment. The estimated amounts of these flows were calculated from available data mainly from SWA and IWS using different methods based on the data provided.

Method for Samoa Water Authority (SWA)

Most of the information provided to SBS by SWA also reported in SWA annual reports regarding water production, supplies and other information. Table 8 summarises the information on metered water supplied to households and commercial industries by three major regions.

Table 8: Samoa Water Authority – Metered water supply

	2011-12	2012-13	2013-14	2014-15
Cubic meters (m³)				
Household metered supply				
▪ Upolu urban	2,309,894	1,982,085	2,638,757	2,940,847
▪ Upolu rural	2,063,973	1,933,078	2,323,974	3,027,456
-	1,221,422	1,222,408	1,224,087	1,205,275

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/报告?reportId=5_1325

