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Review of the Status of the Water and Sewerage Authority (WASA)

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Abbreviations

Desalcott – The Desalination Company of Trinidad and Tobago

FSE – Full Service Equivalent

NRW – Non-Revenue Water

m³ – cubic metre

RIC - Regulated Industries Commission

WASA – Water and Sewerage Authority

UFW – Unaccounted For Water

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1. Introduction

1.1 Background

The Regulated Industries Commission (RIC) Act, No. 26 of 1998, established the RIC as a statutory body. Section 6 of the Act empowers the RIC, among other things to:

- establish the principles and methodologies by which service providers determine rates for services;
- carry out periodic reviews of the rating regime of service providers; and
- carry out studies of efficiency and economy of operation and performance by service providers and publish the results thereof.

These obligations encompass core aspects of the organisation's operations.

Additionally, the Act specifically requires the RIC to consult with service providers, representatives of consumer interests groups and other stakeholders. It is in keeping with these objectives and responsibilities that this document, "Review of the state of the Water and Sewerage Authority (WASA)", is being made available to the public.

1.2 Objective

In this Information Document, the RIC reviews the operational and financial state of the Water and Sewerage Authority of Trinidad and Tobago (WASA) and compares its performance with other utilities.

It is widely accepted that a well-run utility will provide efficient service to all customers, at prices which are affordable but which will allow the utility to recover efficient costs and finance new investment. There are five broad characteristics of such a utility: efficient operations and maintenance, financial sustainability, efficient and effective capital investment, responsiveness to customers, and accountability to owners.

In order to assess the operational and financial performance of WASA this review utilises internationally recognized performance indicators¹ that measure the performance of the Authority *vis a vis* the appropriate benchmarks for well-run water utilities in the two major areas examined.

1.3 Sources of information

The information was sourced primarily from WASA. Additional information was utilised from within the RIC and externally from the World Bank, the Office of Water Services of England and Wales (Ofwat) and regional utility regulators.

¹ A performance indicator is a quantitative measure of a particular aspect of the undertaking's performance or standard of service. It assists in the monitoring and evaluation of the efficiency and effectiveness of the utility, thus simplifying an otherwise complex evaluation.

1.4 Structure of Document

The document is organized into five major sections; first the introduction gives the objective and background of the document, then the institutional structure of the sector is outlined. Next, the operational performance of WASA is examined. This is followed by a discussion of WASA's financial performance as well as the Authority's tariffs, and the conclusion.

2. Water and Wastewater Sector Structure

This section gives an overview of the **structure of the sector**, as well as a brief profile of the Authority's physical assets and organisational structure.

2.1 Structure of the Sector

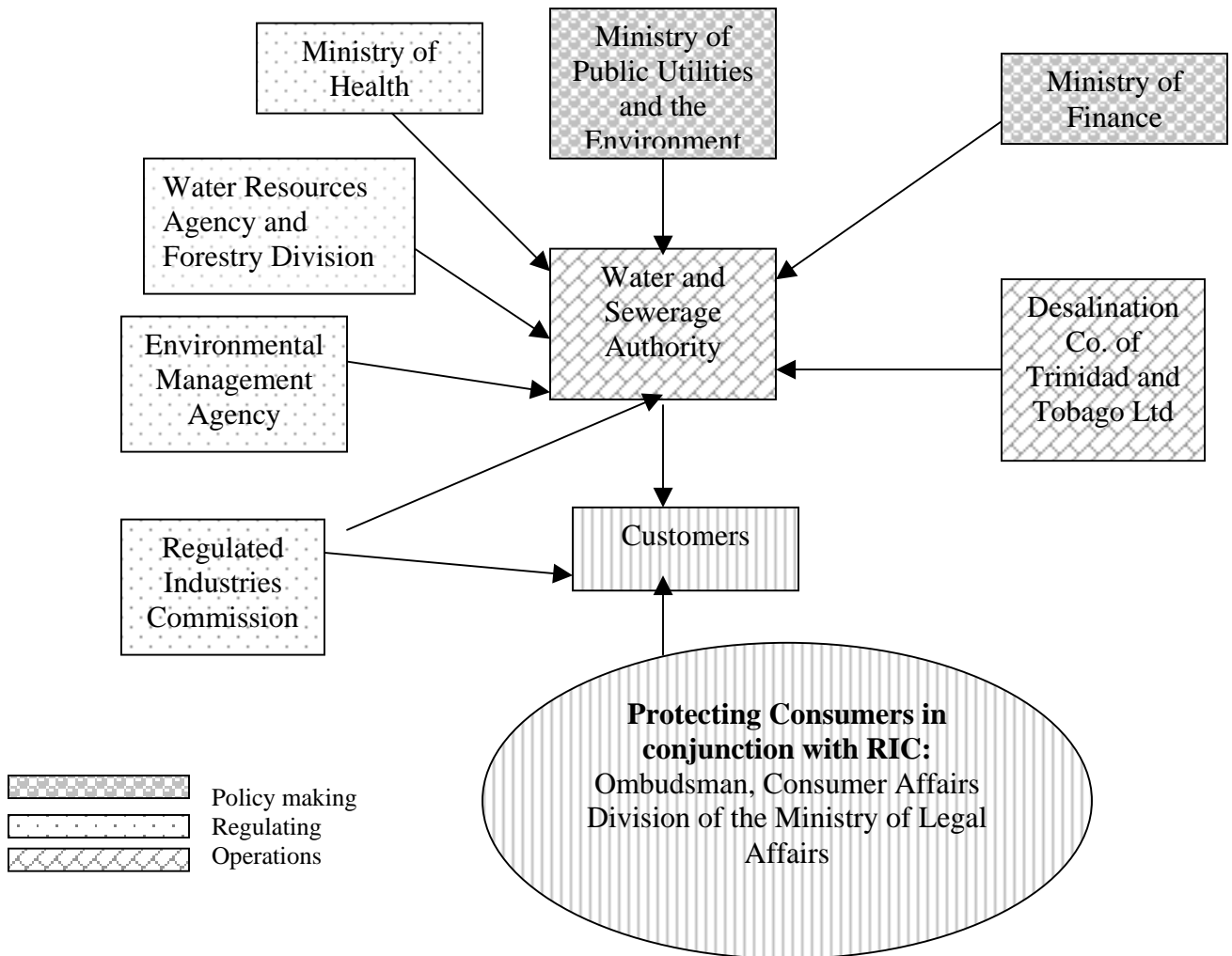
WASA is a vertically integrated, government-owned and operated statutory authority. It operates under the Water and Sewerage Act, Chapter 54:40 of 1965, with amendments. The Authority is solely responsible for the provision of water and wastewater services in Trinidad and Tobago and is therefore a monopoly provider. In order to increase the supply of water available to customers WASA entered into a water sale agreement with the **Desalination Company of Trinidad and Tobago Ltd** (Desalcott) which supplies 22 million gallons of water to WASA per day of which approximately half goes to the Point Lisas Industrial Estate. Other major stakeholders in the sector and their responsibilities are as follows:

- The **Ministry of Public Utilities and the Environment**- this is the Authority's line ministry and consequently it is responsible for policy formulation for the sector. Under the RIC Act, the Minister is also responsible for granting licences to water and wastewater providers. Additionally, the Minister may, on the advice of the RIC, make regulations prescribing:- (i) procedures for licence applications, (ii) the issue, suspension and cancellation of licences, (iii) terms and conditions of licences generally, and (iv) licence fees;
- The **Ministry of Finance**- this Ministry has overall responsibility for all financial matters pertaining to the funding of government and government-owned entities. Since WASA has been unable to finance capital projects from internally generated funds, all large capital expenditure projects to be undertaken by WASA must be approved by the Ministry of Finance, as it either provides direct funding for some of these projects through the annual budget, or government guarantees for loans when funding is sought for capital projects from the commercial banking sector. Additionally, it works in conjunction with the Ministry of Planning and Development and the line Ministry, when it is necessary to secure funding for WASA from international agencies such as the World Bank;
- The **Ministry of Health**- this Ministry is responsible for setting, monitoring and enforcing the standards for the quality of drinking water in Trinidad and Tobago. However, no drinking water standards specific to Trinidad and Tobago have been set and World Health Organisation standards are adhered to instead;

- The **Regulated Industries Commission (RIC)**- the RIC is the economic regulator for the Water and Wastewater Sector in Trinidad and Tobago. The RIC's role as provided in its Act, includes- (i) advising the Minister on the operations of the Act, including the granting of licences, (ii) ensuring that service providers operate under prudent management on terms that will allow sufficient return to finance investment, (iii) prescribing and publishing service standards, (iv) imposing sanctions for non-compliance to service standards, (v) establishing principles and methodologies for rate-setting and monitoring to ensure compliance, investigating complaints, (vi) facilitating competition and (vii) imposing and collecting fees. Additionally, the RIC is responsible for investigating the complaints of consumers who have been unable to obtain redress from service providers;
- The **Environmental Management Authority (EMA)**- the EMA is the statutory body established by the EMA Act 1995, responsible for environmental protection and conservation, including monitoring and enforcing water pollution and trade effluent levels; and
- The two main bodies responsible for addressing consumer concerns in Trinidad and Tobago include the **Office of the Ombudsman** and the **Consumer Affairs Division** of the Ministry of Legal Affairs. These two bodies work in conjunction with the RIC to ensure that the interests of consumers in respect of service providers are protected.
- There are a number of agencies involved in the execution of water resources management functions. However, the primary institution is the **Water Resources Agency (WRA)**. However, while the WRA is currently located as a department within WASA, the Government through its Draft National Water Resources Management Policy has indicated its intention to establish an autonomous authority for the management of the country's water resources. Additionally, the **Forestry Division of the Ministry of Public Utilities and the Environment** plays a critical role in the management of the country's forest cover and thus watershed management. Over the past thirty years forest cover has substantially decreased and this has contributed to widespread flooding.

The institutional structure of the Water Sector in Trinidad and Tobago is illustrated in Figure 1².

Figure 1
Institutional Structure of the Water Sector in Trinidad and Tobago



2.2 Organisational Structure

As stated previously, WASA is a public sector water supply and wastewater statutory authority. It is headed by a Board comprised of eight (8) Commissioners, which is responsible for matters of general policy. WASA's management, which currently consists of a Chief Executive Officer and six (6) General Managers³, is responsible for the day to day running of the Authority. Other top managers include the Corporate

² The Diagram does not capture all the intricacies of the Sector but summarises the main inter-relationships among the key players.

³ As at December 31, 2002, there were seven General Manager positions listed on WASA's Organisational Structure Chart. It included the following positions: GM-Finance, GM-Operations, GM-Business Services, GM-Human Resources and Corporate Communications, GM-Corporate Services, GM-Tobago Services, and GM- Water Resources Agency (WRA). However, the position of GM-Water Resources Agency is not filled currently, but there is a Director WRA who heads the agency.

Secretary and the Head of Internal Audit. The Authority's organizational chart is attached at **Appendix I**.

2.3 Physical Profile

2.3.1 Main Water Supply Systems

WASA has three impounding reservoirs in Trinidad and four major sources of supply in Tobago. A list of the main water systems in the National Water Grid is provided in **Table 1**.

Table 1
Main Water Supply Systems

Source	Capacity	Production Rates (Daily)
	gallons	gallons
Trinidad		
Caroni Arena (surface reservoir)	9.8 billion (53.0 million m ³)	
Navet (surface reservoir)	4.1 billion (17.0 million m ³)	
Hollis (surface reservoir)	1.04 billion (8.4 million m ³)	
Tobago		
Hillsborough (Dam)	225.0 million (1.0 million m ³)	
Courland		2.0 million (9,091 m ³)
Richmond		1.5 million (6,818 m ³)
Hillsborough West (Treatment plant)		1.5 million (6,818 m ³)

Source: WASA

Note: 220gallons=1m³

The under-mentioned facilities also form part of the Grid:

- 142 water production sources;
- 110 water pumping stations (booster stations);
- 48 rural intakes and spring sources;
- 5800 kilometers (km) of transmission and distribution mains (ranging between 100mm-1350mm in diameter);
- 436 water wells; and
- 175 service reservoirs.

With respect to the 5,800 km of pipelines, WASA estimates that:

- Cast iron accounts for 10% (mid 19th century);
- Asbestos accounts for 10% (late 19th century);
- Galvanise accounts for 15%(early 20th century);
- Steel accounts for 5% (1930s);
- Ductile iron accounts for 25% (late 1970s); and
- PVC accounts for 35% (late 1970s).

2.3.2 Desalination Plant

In order to satisfy the growing demand for water at the Point Lisas Industrial Estate, a twenty-three year contract was awarded to the Desalination Company of Trinidad and Tobago (Desalcott - a joint venture between Hafeez Karamath Engineering Services Limited -60%-, and Ionics Incorporated USA -40%-) to build, own and operate a desalination plant at the Point Lisas Industrial Estate.

The plant has a capacity of 136,000 m³ or 29,920,000 gallons per day, and under the terms of the Water Sale Agreement, WASA purchases approximately 22 million gallons per day.

2.3.3 Wastewater system

With respect to wastewater facilities, WASA owns and operates:

- 12 wastewater systems;
- 12 treatment plants;
- 401 km of public sewer mains (ranging in diameter between 80mm – 1800 mm);
and
- 22 lift stations (wastewater).

Four (4) urban centres, Port of Spain, San Fernando, Arima and Scarborough, account for 95% of the wastewater generated within WASA's systems.

Additionally, there are approximately 150 small private wastewater facilities in operation throughout Trinidad and Tobago. The National Housing Authority (NHA) also owns 22 plants. Many of these facilities have been poorly maintained and/or abandoned by their owners, resulting in improperly treated sewage being discharged into the environment. However, these plants are to be adopted in the near future by the Water and Sewerage Authority.

3.0 Operational Performance

3.1 Water Production/Supply

In 2002, WASA produced 346.7 million cubic meters (m³) of potable water. However, despite increasing production, the water supply has been consistently lower than demand. **Tables 2 and 3** and **Figure 2** refer.

Table 2
Total Annual Water Production
1995-2002

Year	Annual Production (million m ³)
1995	249.1
1996	255.1
1997	276.8
1998	280.6
1999	281.8
2000	310.4
2001	304.9
2002	346.7

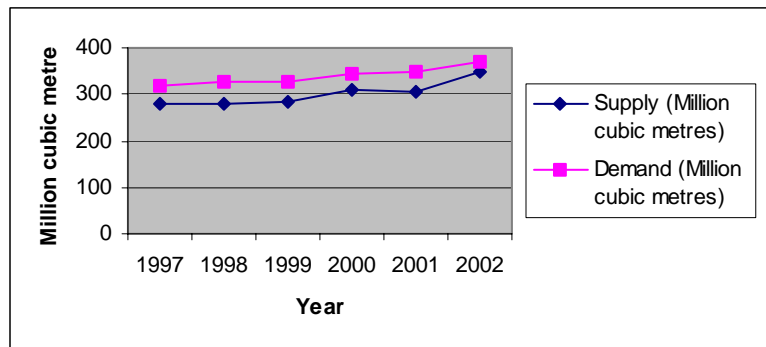
Source: WASA

Table 3
Water Supply/ Demand Balance
1997-2002

	1997	1998	1999	2000	2001	2002
Supply (million m³)	276.8	280.6	282	310.4	304.9	346.7
Demand (million m³)	320	325	329	342	349	368
Deficit/ Surplus (million m³)	(43.2)	(44.4)	(47)	(31.6)	(44.1)	(21.3)

Source: WASA

Figure 2
Water Supply/ Demand Balance
1997-2002



Source: Derived from Table 3

3.2 Service Coverage and Quality of Service

3.2.1 Water Coverage and Continuity of Service

Water Coverage is defined as that percentage of the population, under a utility's nominal responsibility, with easy access to water services either through a direct service connection or residing within 200m of a standpipe. According to WASA, 92% of the country's population has access to a supply. Best practice⁴ in this area is 100%.

Another equally important indicator is Continuity of service, which measures the average hours of service per day for water supply and is indicative of the quality of the service provided by the utility. According to WASA, only 50% of the population served had a 24-hour supply at the end of 2002.⁵ The areas that obtain this supply are listed in **Appendix II. Appendix III** illustrates the classes of supply at the end of May 2002. **Conversely, this suggests that approximately 50% of the population served received a scheduled supply.** Table 4 gives a break down of the hours of service per week received by the population.

Table 4
Availability of Water Supply as at December 2002

Class of Supply	No. of Hours Per Week	% of Population in Receipt of Supply*
Class I	168	50%
Class II	120 to 168	29%
Class III	84 to 120	14%
Class IV	48 to 84	5%
Class V	0 to 48	3%

Source: WASA (*Figures may not add to 100% because of rounding)

⁴ Best Practice is based on the actual performance of the top 25% of utilities surveyed by the World Bank based on data from 246 utilities in 51 developed and developing countries.

⁵ WASA uses what is known as the Full Service Equivalent (FSE) to calculate continuity of supply. FSE is calculated by dividing the number of population service hours for the period of supply by the total number of population hours. This is not the ideal method for calculating this indicator but in the absence of a more rigorous method this was utilized.

3.2.2 Sewerage Coverage

Sewerage Coverage is defined as that percentage of the population, under a utility’s nominal responsibility, with a direct connection to sewerage services. This statistic is computed by dividing the population with sewerage services (direct service connection) by the total population under the utility’s nominal responsibility, expressed as a percentage.

In Trinidad and Tobago, WASA has estimated that approximately 20% of the population is served by its facilities. The National Housing Authority (NHA) and private plants service a further 10% of the population. The remaining 70% utilizes septic tanks and pit latrines.

3.2.3 Unaccounted for Water/Non-Revenue Water

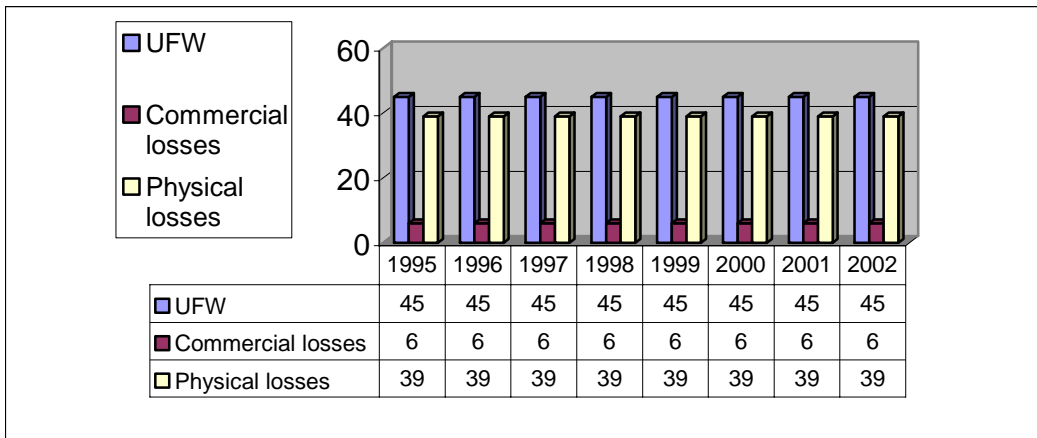
A major concern about the operations of any water utility is the level of Unaccounted For Water (UFW) or Non-Revenue Water (NRW). UFW or NRW reflects the difference between the volume of water delivered to the distribution system and the water sold by the utility. It includes:

- physical or technical losses such as pipe breaks (leaks), and overflows; and
- commercial losses (meter under-registration, illegal use including fraudulent or unregistered connections and legal, but usually unmetered, uses like fire fighting).

It is most commonly defined as the difference between the volume of water supplied to the distribution system and the water sold, expressed as a percentage of net water supplied. WASA estimates that about **45%** of the water distributed annually is lost as UFW or NRW, of this amount, **39%** is due to technical losses (see pipe network performance) and **6%** to illegal usage. **The best practice for this indicator is less than 23 % for most developing countries.** Figure 3 illustrates the percentage of UFW for the 1994-2002.

Figure 3

Unaccounted For Water (Non Revenue Water) 1995-2002 (%)



3.2.4 Pipe Network Performance

Pipe network performance is measured either by the total number of pipe breaks per year expressed per kilometre (km) of water distribution network or total number of pipe breaks per year expressed per number of water connections. In the case of WASA, its pipeline network is, in many areas, over fifty years old and despite efforts to either replace portions of and/or expand the network, pipe network performance remains well below international best practice. Consequently, in 2002 WASA experienced approximately six breaks per km of water distribution network per year, compared to a well maintained utility which has approximately one break per km per year of distribution network. **Table 5** illustrates Pipe Breaks for the period 1998-2002.

Table 5
Pipe Breaks 1998- 2002

North	1998	1999	2000	2001	2002
Supply Pipe Breaks - North	6628	8219	7661	10961	12853
Mains Pipe Breaks - North	123	399	306	2065	3510
South	1998	1999	2000	2001	2002
Supply Pipe Breaks - South	7241	7325	5284	6792	9596
Mains Pipe Breaks - South	470	528	355	2235	5021
Tobago	1998	1999	2000	2001	2002
Supply Pipe Breaks - Tobago	3002	3054	2630	3389	3239
Mains Pipe Breaks - Tobago	27	9	123	479	1066
Total	1998	1999	2000	2001	2002
Supply Pipe Breaks	16871	18598	15575	21142	25688
Mains Pipe Breaks	620	936	784	4779	9597
Total Breaks	17491	19534	16359	25921	35285

Source: WASA

4 Economics of the Sector

This section gives an overview of the financial performance of the sector as well as the customer profile and the tariff structure of the sector.

4.1 Financial Profile

The history of WASA's financial performance has been one of loss-making, high operating costs and low revenues. This is due in part to:

- (i) a tariff structure that is unrealistically low; and
- (ii) poor collection policy.

This sub-section presents an historical overview of the utility's performance as well as its bench-marked performance for the year 2002.

4.1.1 Summary of Operations

A summary of WASA's Income Statements for the period 1996-2002 is presented in **Table 6**. The overall picture is dismal. In 2002 the operating deficit was **TT\$169.8 million**. The overall deficit for the 2002 financial year, including financial and other charges, was **TT\$456.4 million**. Additionally, the accumulated deficit as at the end of the 2002 financial year was **TT\$5.8 billion**.

Table 6
Summary of Income Statements
Financial Years 1996-2002

(TT\$ Million)

	1995/96*	1996/9 7	1997/98	1998/99	1999/00**	2000/01	2001/02
Revenues							
Water rates - general	302.6	225	242.2	307.3	503.8	357.9	360.9
Sewerage rates	42.7	22.2	25.1	27.2	38.9	25.7	27.6
Other income (includes interest)	9.4	22.9	22.9	22.6	30.7	19.1	13.9
Total Revenue	354.7	270.2	290.2	357.1	573.4	402.7	402.4
Expenditure before depreciation	408	434.8	420.3	397.2	602.6	409.1	499.0⁶
Desalination Expenses	-	-	-	-	-	-	73.2
Net operating deficit before depreciation	(53.4)	(164.6)	(130.0)	(40)	(29.2)	(6.4)	(169.8)
Depreciation	(47.8)	(37.9)	(40.4)	(49)	(123.6)	(46.6)	(50.1)
Government of Trinidad & Tobago related expenses	-	(69.8)	(93.4)	-	-	(24.7)	(19.8)
Exceptional items ⁷	(474.6)	-	(75.7)	(1.4)	(52.8)	(19.2)	(30.4)
Finance costs	0	(28.3)	(39)	(94.5)	(201.8)	(152.7)	(186.3)
Overall Deficit	(575.8)	(300.6)	(378.6)	(184.9)	(407.4)	(249.6)	(456.4)

* 15 month period ending 3/4/96

** 18 month period ending 30/9/00

Total Figures may not add because of rounding.

Source: Figures computed from WASA's financial statements

⁶ Does not include Desalination expenses.

⁷ Includes provision for Bad/Doubtful Debt.

4.1.2 Operational Costs

WASA's operational costs fell during the period 1996 to 1999 both in current and real terms. However, if the years 1996 and 2002 are compared, in real terms it rose by 6%. During that time personnel costs increased by about 41% (current terms), expenditure on premises increased by 15% (current terms) and expenditure on supplies and services fell by about 1%. Additionally, expenditure on transport and plant increased by 10% (current terms) and administration expenses fell by 41% (current terms).

A summary of WASA's operational costs for the period 1996/1997 to 2001/2002 is presented in **Table 7**.

Table 7
Expenditure 1997-2002

(TT\$million)							
EXPENDITURE	1996/97	1997/98	1998/99	1999/00*	1999/00**	2000/01	2001/02
Personnel	191.54	198.22	190.26	309.90	206.60	229.32	270.80
Premises	41.76	46.02	40.19	68.57	45.71	50.07	47.91
Supplies and Services	116.60	123.91	112.84	129.19	86.13	86.85	115.48
Transport and plant	19.95	21.82	16.55	26.85	17.90	18.93	22.03
Administration	64.91	30.31	37.32	68.07	45.38	20.66	38.17
Miscellaneous Exps						3.22	4.69
Desalination Exp							73.2
TOTAL OPERATING EXPENDITURE	434.77	420.29	397.17	602.59	401.72	409.06	572.2
Consumer Price Index***	119.1	125.8	130.1	134.7	134.7	142.2	148.1
Expenditure in Real Terms	365.04	334.09	305.28	447.36	298.23	287.66	386.36

*18 month period ending 30/9/00

**18 month period worked on a twelve month basis

*** Consumer Price Index (as calculated by the Central Statistical Office where 1993= 100)

Figures may not add because of rounding

Source: Computed from WASA's financial statements

WASA's Unit Operational Costs (i.e. Total annual operational expenditure/Total annual water produced), inclusive of financial and other expenses are presented in **Table 8 and Figure 4**.

During the period 1996 to 2000 unit operational costs fell in real terms from TT\$1.43 to TT\$0.96, which constitutes a fall of 35% in unit operational costs. However, unit operational costs rose from TT\$1.25 in 2000 to TT\$1.59 in 2002, a rise of about 27%. These movements are directly related to the movements in Personnel Costs.

Table 8
Unit Operational Costs 1997-2002

	1996/97	1997/98	1998/99	1999/00*	1999/00**	2000/01	2001/02
Unit Operational Costs TT\$ per M ³ of water produced in real terms	\$1.43	\$1.21	\$1.09	\$1.44	\$0.96	\$0.94	\$1.11
Total annual operational exp (\$million) in real terms	365.04	334.09	305.28	447.36	298.23	287.66	386.36
Consumer Price Index	119.1	125.8	130.1	134.7	134.7	142.2	148.1
Unit Operational Costs TT\$ per M ³ of water produced	\$1.70	\$1.52	\$1.41	\$1.94	\$1.29	\$1.34	\$1.65
Total annual operational exp (\$million) in current terms	434.77	420.29	397.17	602.59	401.73	409.06	572.2
Total annual water produced (M ³ -million)	255.14	276.79	280.57	310.40	310.40	304.90	346.76

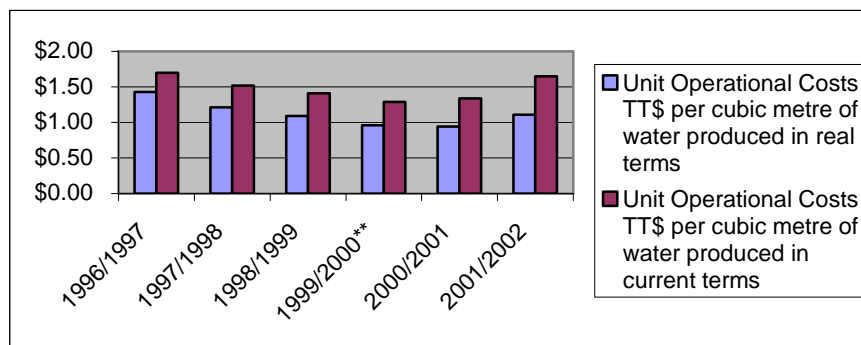
*18 month period ending 30/9/00

**18 month period worked on a twelve month basis

Consumer Price Index (as calculated by the Central Statistical Office where 1993= 100)

Source: Computed from WASA's financial statements

Figure 4
Unit Operational Costs 1997-2002



Derived from Table 8

Table 9 and **Figure 5** provide a breakdown of operating costs (inclusive of desalination expenses) for 2002 as a percentage of total operating costs. Salaries and wages together with supplies and services constitute the largest expenditure items.

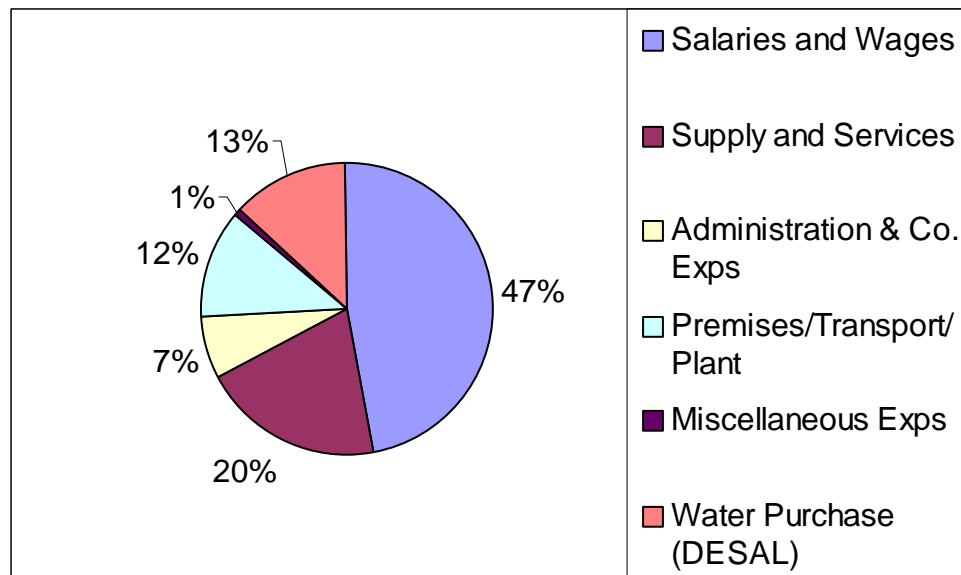
Table 9
Breakdown of Operating Costs for 2002

Components	Total Cost	Percentage of Total Costs
Salaries and Wages	270.8	47
Supplies and Services	115.5	20
Administration and Company Expenses	38.2	7
Premises (includes electricity, telephones, accommodation), and Transport & Plant	69.9	12
Miscellaneous Exp	4.7	1
Water Purchase (DESAL)	73.2	13
Total	572.2	100

(TT\$ million)

Totals may not add because of rounding
Source: WASA

Figure 5
Breakdown of operating costs for 2002

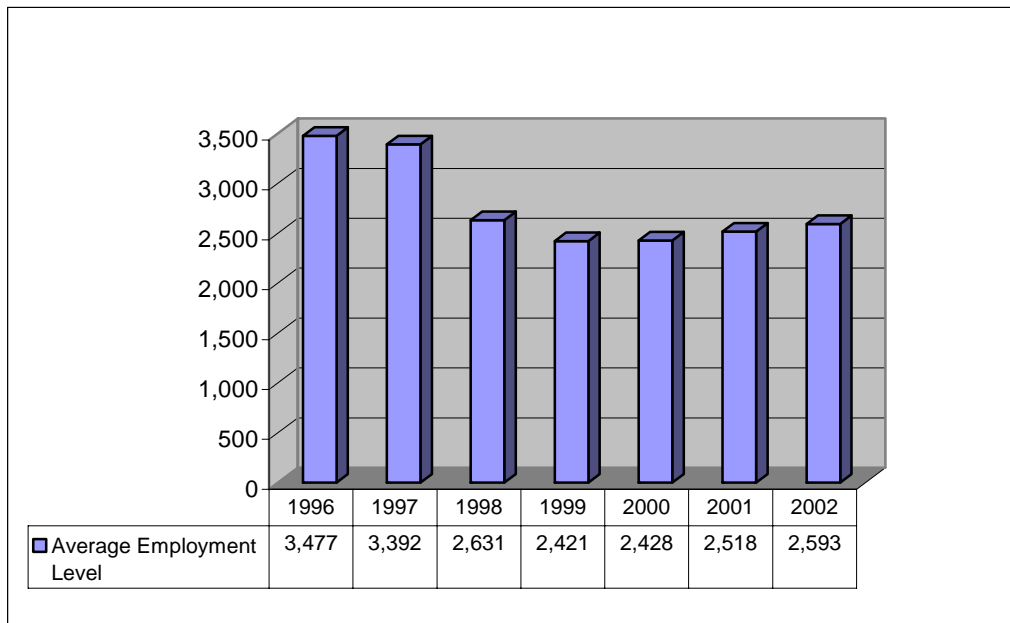


Derived from Table 9

4.1.3 Costs and Staffing

Figure 6 illustrates the average employment levels (monthly and daily paid) for the period 1995 to 2002. During that period average employment levels fell from 3,477 to 2,593 at the end of 2002.

Figure 6
Average Employment Levels (monthly and daily paid) 1996 to 2002



Source: WASA

In order to assess the impact of personnel costs on the operations of a utility the following performance indicators are generally utilized:

- Total number of staff per thousand water connections;
- Total annual labour costs (including benefits) expressed as a percentage of total annual operational costs;
- Staff composition, that is, the category/level of staff as a percentage of the labour force.

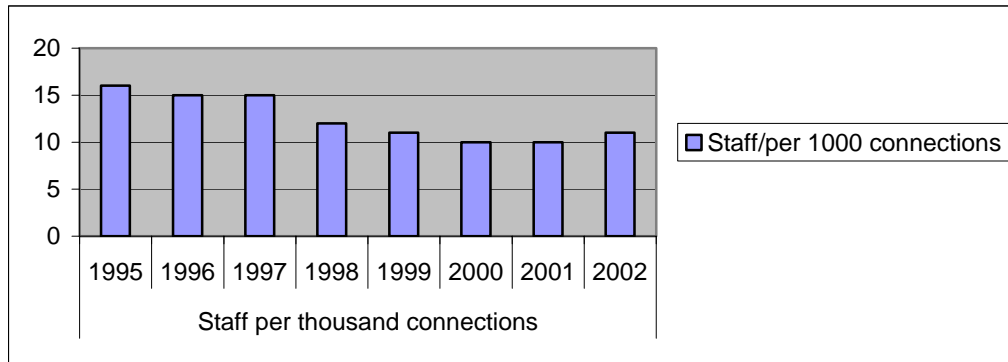
In 2002, WASA's staff per thousand water connections was approximately 11. **The benchmark for developing countries for this indicator is 5, but it can be as low as 2 to 3 in developed countries.** Table 10 and Figure 7 illustrates the staff per thousand connections for the period 1995 to 2002.

Table 10
Staff per Thousand Water Connections 1995-2002

	1995	1996	1997	1998	1999	2000	2001	2002
Total number of employees	3,629	3,477	3,392	2,631	2,421	2,428	2,518	2,593
Total number of connections '000	224	224.82	226.5	228.3	229.2	239.5	242.64	240.6
Staff/per 1000 connections	16	15	15	12	11	10	10	11

Source: WASA

Figure 7
Staff per Thousand Water Connections 1995-2002



Derived from Table 10

Table 11 illustrates total operational and total annual labour costs. Total operating expenditure in 2002 was \$572.2 million with personnel expenditure being \$270.8 million or 47% of operating expenditure. **The best practice in this area is less than 40%.**

Table 11
Total Operational Costs and Total Annual Labour Costs 1997-2002

	(\$million)						
	12 mths to 31/3/97	12 mths to 31/3/98	12 mths to 30/9/99	18 mths to 30/9/00	18 mths to 30/9/00 worked on twelve months basis	12 mths to 30/9/01	12 mths to 30/9/02
Operational Costs	434.7	420.3	365.6	602.6	401.7	409.1	572.2
Annual Labour Costs	191.5	198.2	190.3	309.9	206.6	229.3	270.8
Labour Costs expressed as a percentage of operational costs (%)	44	47.2	52	51.4	51.4	56.0	47.3

Source: WASA

4.2 Revenue Collection

4.2.1 Total Revenue

During the period 1996 to 2002 WASA's total revenue grew in real terms from \$246.9 million to \$271.7 million, an increase of 10%. WASA's total revenue for the period 1996-2002 is presented in **Table 12**.

Table 12
Total Revenue, 1996-2002

(TT\$ million)						
Year	Water	Sewerage	Other	Total Revenue	Consumer Price Index	Total revenue (real)
Mar-96*	302.6	42.7	9.4	354.7	114.9	308.7
Mar-96**	242.1	34.1	7.5	283.8	114.9	246.9
Mar-97	225.0	22.2	22.9	270.2	119.1	226.9
Mar-98	242.2	25.1	22.9	290.3	125.8	230.8
Mar-99	307.3	27.2	22.6	357.1	130.1	274.5
Sep-00***	503.8	38.9	30.7	573.4	134.7	425.7
Sep-00****	335.9	25.9	20.5	382.2	134.7	283.7
Sep-01	357.9	25.7	19.1	402.7	142.2	283.2
Sep-02	360.9	27.6	13.9	402.4	148.1	271.7

* 15 month period ending 3/4/96

**15 month period ending 3/4/96 worked on a twelve month basis (totals may not add because of rounding)

***18 month period ending 30/9/00

****18 month period ending 30/9/00 worked on a twelve month basis (totals may not add because of rounding)

Consumer Price Index (as calculated by the Central Statistical Office where 1993 = 100)

Source: Computed from WASA's financial statements

4.2.2 Revenue by Major Category

In terms of sources of revenue, in 2002 water rates constituted about 90% of total revenue while sewerage accounted for about 7%. **Table 13** and **Figure 8** illustrate the revenue by source.

Table 13
Revenue by Major Category 1996-2002

(TT\$ million)								
REVENUES	1995/96*	1996/97	1997/98	1998/99	1999/00**	1999/00***	2000/01	2001/02
Water Rates	302.62	225.04	242.17	307.31	503.78	335.85	357.88	360.94
Sewerage rates	42.66	22.23	25.14	27.21	38.92	25.95	25.69	27.59
Sundry charges and income	9.39	22.92	22.94	22.58	30.66	20.44	19.08	13.91
TOTAL	354.67	270.20	290.25	357.11	573.37	382.24	402.65	402.44
Consumer Price Index	114.9	119.1	125.8	130.1	134.7	134.7	142.2	271.7
Real Total Revenue	308.68	226.87	230.72	274.49	425.66	283.77	283.16	148.12

* 15 month period

ending 3/4/96

** 18 month period ending 30/9/00

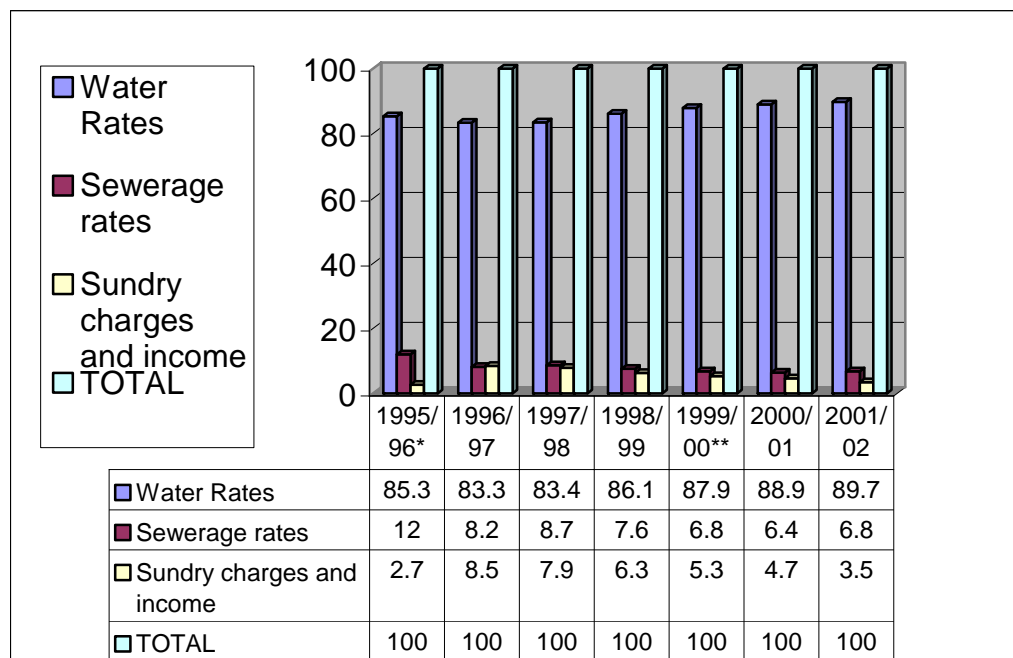
*** 18 month period ending 30/9/00 worked on a twelve month basis

Totals may not add because of rounding

Consumer Price Index (as calculated by the Central Statistical Office where 1993 = 100)

Source: WASA financial statements

Figure 8
Revenue by Major Category as a percentage of Total Revenue
1996-2002



Source: WASA

In **Table 14** it can be seen that in 1999/2000, for the first time industrial customers became the largest single source of revenue for water. In the case of revenue from sewerage, domestic customers continued to be the largest single source of revenue.

Table 14
Breakdown of WASA's Revenue by Category 1996-2002

	(TT\$ million)						
REVENUE	1995/96*	1996/97	1997/98	1998/99	1999/00**	2000/01	2001/02
Water Rates	302.62	225.04	242.17	307.31	503.78	357.88	360.94
- Domestic	119.87	119.45	125.40	132.81	204.80	144.02	146.43
- Commercial	83.02	64.22	48.82	52.74	70.29	45.56	50.94
- Industrial	65.95	38.24	65.12	118.26	223.75	162.81	158.83
- Other	33.78	3.13	2.84	3.50	4.94	5.48	4.73
Sewerage rates	42.66	22.23	25.14	27.21	38.92	25.69	27.59
- Domestic	16.71	11.40	13.54	13.74	20.02	13.90	13.66
- Commercial	22.73	9.88	9.83	11.31	17.24	9.84	11.69
- Industrial	3.31	0.99	1.67	1.88	1.35	1.59	1.88
- Other	(0.10)	(0.05)	0.10	0.28	0.31	0.36	0.35
Sundry charges and income	9.39	22.92	22.94	22.58	30.66	19.08	13.91
- Disposal of faecal matter	0.56	0.69	0.88	0.87	0.62	0.41	0.45
- Income from stores	0.02	0.01	(0.02)	0.23	(0.21)	0.55	0.00
- Interest income	1.43	7.63	6.77	7.79	6.86	7.46	1.10
- Rental income	2.28	2.03	1.60	1.61	2.43	1.67	1.70
- Reconnections and other income	5.08	12.56	13.70	12.08	20.96	8.99	10.66
TOTAL	354.66	270.20	290.25	357.1	573.37	402.65	402.44

* 15 month period ending 3/4/96

** 18 month period ending 30/9/00

Totals may not add because of rounding

Source: WASA

4.2.3 Receivables/ Liquidity Ratios

Receivables are amounts due that arise from the sale of goods or services, or from the granting of loans. In the case of a water utility like WASA, it would be tariffs payable by water and sewerage customers.

At the end of the financial 2002 total receivables were approximately **TT\$528 million** of which Government Ministries and Agencies owed an estimated **TT\$111.0 million**. However, residential customers owe the largest portion of receivables. **Table 15** presents the breakdown of receivables as the end of fiscal 2002.

Table 15
Breakdown of Receivables at September 2002

	(\$million)	
	\$	%
Government Ministries/Agencies	111.07	21
Non-Government	416.88	79
Residential	266.38	50
Business	40.19	8
Industrial	15.96	3
Tobago	14.08	3
Other	80.28	15
	527.95	100

Figures may not add because of rounding
Source: WASA

This level of receivables is extremely high for any utility and has impacted adversely on the operations of the Authority. Consequently, WASA has had to rely on overdraft facilities, which tend to be high cost funds to finance operating expenditure. Two indicators that are useful for measuring the quality⁸ and liquidity⁹ of receivables include:

- the revenue collection ratio - cash collection/revenue expressed as a percentage.
- the collection period (which measures the average period of time that it takes the utility to collect debts) – year end accounts receivable/total operating revenue × 12 months.

Table 16 presents the revenue collection ratio for the period 1990-2002.

Table 16
Revenue Collection Ratio 1996-2002

	1996	1997	1998	1999	2000	2001	2002
Revenue Collection Ratio (%)	55	68	87	79	63	68	68

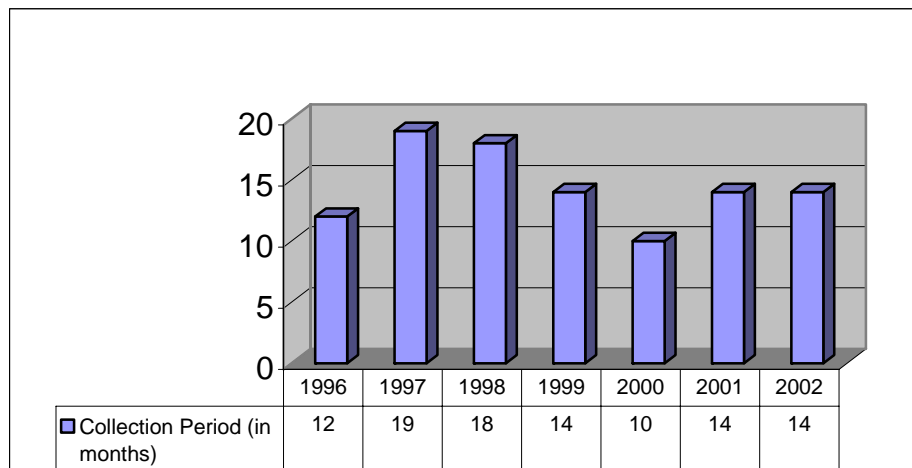
Source: WASA

With respect to the Authority's collection period, in 2002 it was fourteen months, while **best practice in this area is less than three months**. **Figure 9** illustrates the collection period for the period 1996-2002.

⁸ Quality in this context refers to the likelihood of collection without loss.

⁹ Liquidity is used here to refer to the speed of converting receivables to cash.

Figure 9
Collection Period 1996 - 2002



Source: WASA

A company's short-term liquidity risk is affected by the timing of cash inflows and outflows along with its prospects for future performance. Common ratios to measure liquidity include:

- the Current Ratio or Working Capital Ratio – Current Assets/Current Liabilities.
- the Acid Test (Quick) Ratio – (cash + cash equivalents + marketable securities + accounts receivables) /current liabilities.

Table 17 illustrates the current ratio for the period. A current ratio of less than one is an indication that the utility has short-term liquidity problems.

Table 17
Current Ratio 1996 – 2002

	1996	1997	1998	1999	2000	2001	2002
Current Ratio	0.2	0.4	0.4	0.6	0.5	0.1	0.2

Source: WASA

WASA's provision for bad/doubtful debt or un-collectibles was about \$349 million.

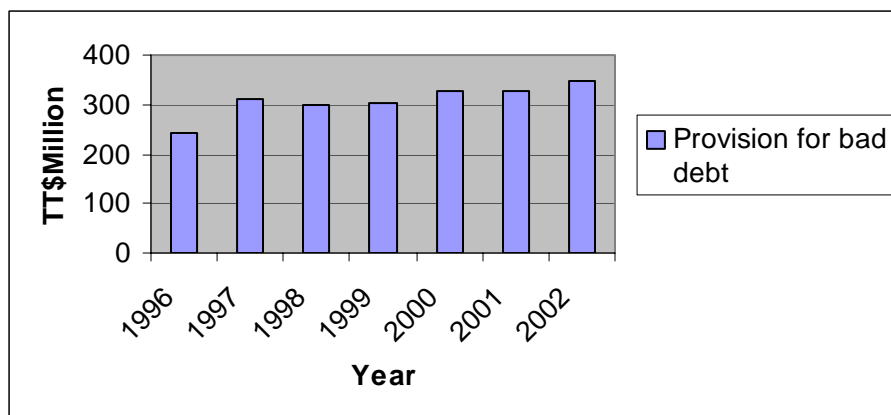
Table 18 and Figure 10 illustrate the provision for bad debt for the period 1996-2002.

Table 18
Provision for Bad Debt 1996 –2002

	TT\$ million						
	1996	1997	1998	1999	2000	2001	2002
Provision for bad debt	244	311	298	305	326	328	349

Source: WASA

Figure 10
Provision for Bad Debt 1996-2002



Derived from Table 18

4.3 Working and Operating Ratios

In order to gauge the financial health of a firm the under-mentioned ratios are generally calculated:

- Working Ratio – The working ratio is the ratio of annual operating costs to annual operating revenues. In this case operating costs exclude depreciation and interest payments.
- Operating Ratio – The operating ratio is the ratio of annual operating costs to annual operating revenues. In this case operating costs include depreciation and interest payments.

If a firm has an operating or working ratio that is greater than one, it is an indication that the firm is in a loss making position. **Best practice with respect to the working and operating ratios is less than 0.7.** WASA's working and operating ratios for 2002 are 1.2 and 2.1 respectively. **Table 19** illustrates the working and operating ratios for the period 1996-2002.

Table 19
Working and Operating Ratios 1996-2002

	1996	1997	1998	1999	2000	2001	2002
Working Ratio	1.0	1.6	1.4	1.0	1.1	1.0	1.2
Operating Ratio	1.3	2.1	2.0	1.5	1.6	1.6	2.1

Source: WASA

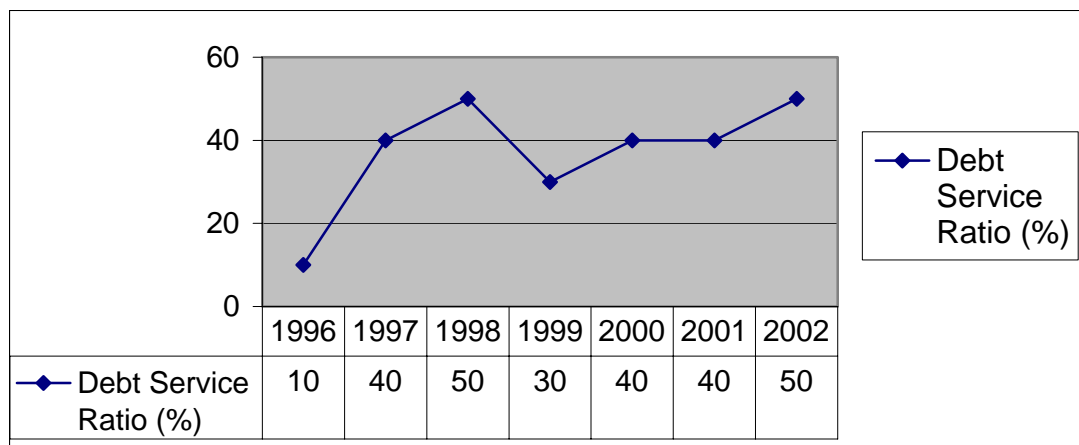
4.4 Debt Financing/ Debt Service Ratio

Given its inability to cover its operating expenses from internally generated revenues, the Authority has become increasingly dependent on government-guaranteed loans and overdraft financing to fund its working capital needs.

As at January 31, 2003, WASA's long-term debt amounted to TT\$2.48 billion (principal) and short-term loans (including overdraft) amounted to TT\$619 million. Total interest payments in respect of its long-term debt are expected to be \$2.47 billion over the life of the loans. The interest that accrued on overdraft facilities for 2002 was \$8.55 million.

Consequently, WASA's Debt Service Ratio for 2002, (total annual debt service expressed as a percentage of total annual operating revenues), was 50%. **Figure 11** illustrates Debt Service Ratio for the period 1996-2002 and **Appendix IV** lists the utility's Debt Stock for 2002.

Figure 11
Debt Service Ratio 1996-2002



Source: WASA

4.5 Capital Investment

WASA's weak financial situation results in its inability to finance any capital investment from internal revenue. Thus the Authority relies either on Government guaranteed loans or direct subventions from Government for Capital projects. During the period 1995/1996 to 2001/2002 WASA spent TT\$1,594.66 million on capital investment. This suggests that on average TT\$228 million were spent annually on capital investment. In contrast, Ofwat, the economic regulator for water in England and Wales, estimates that, on average, based on the price limits set in 1999 the industry will spend £8 million per day on capital investment. In Singapore, the Public Utilities Board, which is the provider for water and wastewater services, spent US\$502 million on capital expenditure in 2002. Of that amount government funded US\$387 million and US\$115 million came from internal

funds¹⁰. **Table 20** lists of major capital projects financed by Government Guaranteed Loans and **Appendix V** gives Total Capital Expenditure for 1995/1996 to 2001/2002.

Table 20
List of Major Capital Projects Financed by
Government Guaranteed Loans, 1997- 2002

Project	Project Cost (\$million)
South Water Project	\$643
North Water Project (Tranche 1)	\$330
North Water project (Tranche 11)	\$225
Tobago Projects	\$54
Corporate Development Plan (CAP) ¹¹	\$50
Short Term Investment Plan ¹²	\$55
Total:	\$1,357

Source: WASA

WASA estimates that by the year 2020 it will need TT\$26 billion for capital investment to improve its service. Of that amount, it is estimated that TT\$16.5 billion is needed for the water sector and TT\$6.3 billion for the wastewater sector. The remaining \$3.2 billion is needed for institutional strengthening.

4.6 Customer Profile and Tariff Structure

This section examines the current customer and tariff structure of WASA.

4.6.1 Customer Structure

As at December 2002, WASA had 317,095 accounts for water customers and 42,818 accounts for wastewater connections. Additionally, only 9,298 of these accounts are metered. In 2001 the Authority had 309,414 customer accounts for water. **Table 21** presents Water Customer Accounts for the periods 1999/00 and 2000/01.

¹⁰ Financial Statements of the Public Utilities Board of Singapore. 30th, April 2003.

¹¹ It is estimated that that the amount needed to fund the three-year program is \$551mn. However, only \$50mn has been accessed from the North Water Project.

¹² The amount of \$55mn expended on the STIP was reassigned from North Water Project.

Table 21
Potable Water Customer Accounts – 1999/00 and 2000/01
 (as at 30th September of fiscal year)

User Class	Code	Number of	Number of
		Accounts	Accounts
		1999/00	2000/01
Social:			
Standpipe	A1	63,915	61,801
Fire		-	-
Total Social Customers		63,915	61,801
% of Total		20.8	19.8
Residentials:			
Yard/Building Tap	A2	25,062	24,486
Internally plumbed – unmetered	A3	205,564	209,471
Internally plumbed – metered	A4	3,698	3,693
Total Residential customers		234,324	237,650
% of Total		76.2	76.8
Business Customers:			
Industrial – unmetered	B3	137	131
Industrial – metered	B4	288	289
Commercial – unmetered	C3	1,711	2,004
Commercial – metered	C4	4,304	4,310
Total Business customers		6,440	6,734
% of Total		2.1	2.2
Other Customers:			
Charitable Organizations – unmetered	A5	1,362	1,397
Charitable Organizations – metered	A6	8	10
Cottage – unmetered	D3	231	394
Cottage – metered	D4	404	410
Agriculture – unmetered	E3	539	568
Agriculture – metered	E4	449	450
Total Other customers		2,993	3,229
% of Total		0.9	1.0
Grand Total		307,672	309,414
% Growth			0.6
Metered Customers – Total (%)		3.0	3.0

Source: WASA

4.6.2 Tariff Structure¹³

WASA's current tariffs were implemented in December 1993, following PUC Order Number 83. These tariffs increased rates by a weighted average of 22%. It was only the third time in the last sixty years that tariffs were increased, the previous times being 1937 and 1985. However, a special water improvement rate of \$4.00 per cubic metre has been implemented at the Point Lisas Industrial Estate where customers pay \$7.50 per cubic metre. The current tariff structures for water and wastewater services are shown in **Tables 22 and 23**, respectively.

¹³ Most tariffs are a combination of some or all of the following elements:

- A **connection charge**, which is a "one-off" and (normally) "up-front" charge for connecting a customer to the water supply and/or sewage systems. However, many countries distinguish between connection charges (non-recurring) and fixed charges (recurring).
- A **fixed charge** (sometimes known as a standing charge or flat fee) which, is normally either equalized for each customer (e.g. within a given customer class or at a particular geographical location), or linked to some other customer characteristic (e.g. size of supply pipe, property value, number of water using appliances).

If a metering system is in place, the following elements also occur:

- A **volumetric rate**, which when multiplied by the volume of water consumed in a charging period gives rise to the volumetric charge for that period. Economic efficiency and environmental criteria both suggest that this element should ideally recover all costs that vary with average or peak demands made on the system (in both the short and the long-run).
- A **block charge**, defined by lower and (except for the highest block) upper volumes of consumption per charging level. Different volumetric rates are frequently attached to different blocks. If rates rise or fall consistently as more water is consumed, the schedules are referred to as increasing or decreasing-block tariffs, respectively.
- A **minimum charge**, usually imposed to protect the utility's finances, which specifies that a certain minimum volume of service will be paid for in each period whether or not that amount has, in fact, been consumed.

Table 22
WASA's Current Tariff for Water Services

Customer class	Category	Metered charges		Unmetered
		TT \$m ³ /qtr	Min. charge	
DOMESTIC				
Standpipe	A ₁			\$33.75/qtr
Externally serviced	A ₂			\$67.50/qtr
Internally serviced	A ₃			(see below)
Internally serviced (M)	A ₄	\$1.75 first 150m ³ , then \$3.50 per m ³ thereafter	\$30/qtr	
Charitable institutions	A ₅			\$108/qtr
Charitable institutions (M)	A ₆	\$1.75 first 150m ³ , then \$3.50 per m ³ thereafter		\$30/qtr
NON-DOMESTIC				
Industrial	B ₃			\$474/mth
Industrial (M)	B ₄	\$3.50 per m ³	\$35/mth	
Commercial	C ₃			\$474/mth
Commercial (M)	C ₄	\$ 3.50 per m ³	\$35/mth	
Cottage	D ₃			\$300/mth
Cottage (M)	D ₄	\$2.50 first 150m ³ , then \$3.50 per m ³ thereafter	\$25/mth	
				15% of ATV Min. charge: \$105/mth
Agricultural	E ₃			
Agricultural (M)	E ₄	\$2.25 m ³	\$20/mth	
Unserviced premises	F			\$50/mth
OTHER				
Swimming pool				\$160/qtr
Building tap:				
	<i>Domestic</i>	A ₄ charges		or A ₃ charges
	<i>Non-Domestic</i>	B ₄ , C ₄ , charges		or B ₃ or C ₃ charges

Internally Serviced (A3) tariffs		
ATV (TT\$)	% ATV	Minimum TT\$/qtr
0 - 500	95	108
501 - 1,000	81	118
1,001 - 2,000	54	203
over 2,000	47	270
Maximum charge \$304/qtr		

Table 23
Current Tariff Structure for Wastewater Services

Customer class	Category	Water metered	Water unmetered
DOMESTIC			
Internally serviced	A ₃		Water bill < \$202.50/qtr, \$75.50/qtr Water bill > \$202.50/qtr, \$93.50/qtr
Internally serviced (M)	A ₄	50% of water bill	
Charitable institutions	A ₅		\$75.50/qtr
Charitable institutions (M)	A ₆	50% of water bill	
NON-DOMESTIC			
Industrial	B ₃		\$237/mth
Industrial (M)	B ₄	50% of water bill	
Commercial	C ₃		\$237/mth
Commercial (M)	C ₄	50% of water bill	
Cottage	D ₃		\$100/mth
Cottage (M)	D ₄	50% of water bill	
Agricultural	E ₃		
Agricultural (M)	E ₄	50% of water bill	

Source: PUC Order Number 83

In reviewing the Tariff structure for both water and wastewater services the following general observations can be made:

- customer classes are defined in terms of activity (e.g. agriculture) or by type of premises (e.g. school) rather than costs imposed on WASA;
- the tariff structure includes two major customer categories, that is domestic and non-domestic;
- some of the separate billing categories are identical, e.g. A₄ for internally serviced domestic customers is the same as A₆ for charitable institutions and places of worship, B₄ industrial is the same as C₄ commercial;
- unmetered customers are typically charged a fixed amount per month or quarter, but customers in categories A₃ and E₃ are charged on the basis of their annual property tax value (ATV), subject to a minimum quarterly or monthly charge;
- tariffs for metered customers are either a single rate per cubic meter per month, subject to a minimum monthly bill (B₄, C₄, E₄), or a rising two-block tariff with a minimum bill per month e.g. D₄ or per quarter e.g. A₄ and A₆; and
- with the exception of agricultural customers in category E₄, all metered customers face the common rate of \$3.50 per cubic metre for at least part of their consumption.

More importantly however, the existing tariff structure has the following characteristics:

- It does not meet the criteria of economic efficiency – the existing tariffs for water and sewerage do not promote an efficient allocation of resources. In years when the demand for water has exceeded the supply prices have not been increased as a rationing device (as required for allocative efficiency).
- Rates are below the levels required to enable WASA to be financially viable.¹⁴ As indicated previously WASA’s overall deficit in 2002 was \$456.4 million and its accumulated deficit as at the end of the 2002 financial year was \$5.8 billion.
- In an effort to ensure that water tariffs are “fair” and to enable customers to meet their basic water needs, WASA implemented certain measures it could ill afford. For example, metered customers are on a two-block tariff, with an initial block of 150 cubic meters per quarter. This block could be thought of as a life-line block¹⁵. However, the size of this block is much too large when considered in terms of the water needed to meet a household’s basic needs for water (drinking, cooking and hygiene-related needs). The initial block of 150m³ per month could be compared to La Paz, Bolivia, where the Lifeline threshold for water is thirty (30) cubic meters per month¹⁶.
- Low tariffs can be considered an *across the board* subsidy which places a heavy burden on both the Authority and on the public purse. **This approach, which is known as the ‘public service delivery model’, has done little to benefit poor and low-income families in terms of actual provision of the service to these groups. In effect it has translated into low prices but no service or inadequate service for these groups.** Low tariffs or the social tariff, as it is sometimes known, has left WASA without the financial resources to properly maintain the distribution system much less expand or upgrade coverage. This situation worsened when Government reduced subventions to WASA. Consequently, low-income groups are sometimes forced to purchase water or collect water from distant sources. **This outcome reflects the “hydraulic law of subsidies” (Alfaro et al, 1997) that is, those who get no services get no subsidy, and when there is rationing, it is the poor who are “at the end of the line”.** The social tariff has also contributed to wasteful consumption practices among some consumers.
- The tariff structure is too complex and has too many charging categories. Some categories are identical e.g. B and C, and no useful purpose appears to be served by maintaining their separation.
- The metered volumetric rate for commercial/industrial customers (\$3.50 per cubic meter) is twice the metered volumetric rate for domestic customers (\$1.75 per cubic meter). This suggests that there may be cross-subsidisation between the two categories of customers.

¹⁴ It is generally accepted that rates should allow the utility to recover efficient costs. In this case given the huge deficit faced by WASA one can easily infer that some ‘efficient costs’ are not being covered by the existing rates.

¹⁵ Under this approach a low rate is charged for an initial block of consumption, which is sometimes referred to as the Life-line Block, and progressively higher rates are then charged for successive blocks.

¹⁶ Estache, Antonio et al (2002) *Accounting for Poverty in Infrastructure Reform* World Bank Institute.

4.6.3 Average Billing

The average billing per customer for WASA is shown in **Table 24**.

Table 24
Average Billing for Customer Classes for the period January to December 2001

Customer Class	Average Monthly Billing (TT\$)	Average Quarterly Billing (TT\$)	Average Annual Billing per Customer (TT\$)
Domestic			
A1	-	\$ 21	\$86.00
A2	-	\$ 44	\$175.00
A3	-	\$142	\$566.00
A4	-	\$931	\$3,723.00
A5	-	\$ 74	\$298.00
A6	-	\$ 85	\$341.00
Sub Total	-	\$118	\$473.00
Industrial			
B3	\$ 297	-	\$3,559.00
B4	\$ 24,855	-	\$298,260.00
B6	\$ 73,206	-	\$878,474.00
Sub Total	\$ 27,132	-	\$325,585.00
Commercial			
C3	\$ 531	-	\$6,376.00
C4	\$ 955	-	\$11,455.00
Sub Total	\$ 820	-	\$9,841.00
Cottage			
D3	\$374	-	\$4,485.00
D4	\$148	-	\$1,774.00
Sub Total	\$259	-	\$3,106.00
Agricultural			
E3	\$103	-	\$1,240.00
E4	\$231	-	\$2,774.00
Sub Total	\$160	-	\$1,919.00
Grand Total	\$ 2,238	\$118	\$1,208.00

Source: WASA

4.6.4 Comparison of Tariff Structure

It has been noted that the tariff structure¹⁷ is often a combination of some or all of the following elements:

- A connection charge (one-off charge)
- A fixed charge

If metering is in place the following elements also occur:

- A volumetric rate
- A block charge
- A minimum charge

¹⁷ See Footnote 14 for definitions of each element of the Tariff Structure.

In order to compare cross country tariffs¹⁸ one of the most common indicators is the average tariff which is the total annual operating revenues (water and sewerage) divided by annual amount of water sold. **Table 25** compares the Average Tariff (water and sewerage) of selected UK firms with Trinidad and Tobago. It illustrates that the average tariff in Trinidad and Tobago is substantially lower than in the UK, where the tariff structure more closely reflects the economic cost of production.

Tables 26 and **27** compare the volumetric rates and fixed charges for water among selected countries which are also useful indicators. They show that WASA's domestic rate is lower than those in the UK and Barbados. However, while Jamaica's volumetric rate for its first block of consumption is lower than the volumetric rate in Trinidad and Tobago, domestic customers in Jamaica are required to pay standing charges and their bill is adjusted for changes in the exchange rate, electricity rate and inflation rate. With respect to industrial customers, the volumetric rate in the UK is in general higher than the volumetric rate in Trinidad. When compared to Barbados the rate is the same, and in the case of Jamaica it is higher. However, in Jamaica industrial customers like their domestic counterparts, are required to pay standing charges and the their bill is adjusted as mentioned previously.

Detailed information on the tariff structures of the United Kingdom, Jamaica and Barbados are presented in **Appendix VI**.

Table 25
Average Tariff (Water and Sewerage)

Country	Average Tariff (U\$/m ³ /yr)
Trinidad and Tobago	\$0.19
United Kingdom *(England and Wales)	
Severn Trent	\$2.51
South West	\$3.19
Yorkshire Water	\$2.67

* Based on 2000 figures taken from the World Bank

¹⁸ In general, it is difficult to compare prices across countries. First, tariff schemes may vary greatly across countries. Second, the cost of providing the service may vary between countries. Finally, the services are often subsidized, making comparisons even more difficult.

Table 26
Cross Country Comparison of Tariffs for Metered Domestic Customers

Country/Utility	Domestic		
	Standing Charges (per year)	USm ³	other charges
Trinidad and Tobago	Nil	\$0.28 (up to 150m3)	Nil
United Kingdom (England and Wales)			
Severn Trent	\$27.77	\$1.30	Nil
South West	\$27.58	\$1.40	Nil
Yorkshire:			
Yorkshire	\$32.37	\$1.31	
York	\$32.37	\$0.53	Nil
Barbados:			
Consumption of 0-34m ³ per month	Nil	\$0.76	Nil
Consumption of Over 34m ³	Nil	\$1.07	Nil
Jamaica	All customers pay a fixed monthly service charge based on the size of their connection which varies from 5/8 to 6 inches. 5/8 inch 15mm-\$2.03, 3/4 inch or 20mm - \$4.17, 1 inch or 25 mm - \$5.46, 1 1/4 inch or 30mm - \$10.27, 6 inch or 150mm - \$65.06	For up to 14,000 litres \$0.21/1000 litres, for next 13,000, \$0.45/1000litres, for next 14,000 litres, for next 14,000, \$0.62/1,000 litres, for next 36,000 litres, \$0.77/1000 litres, over 91,000 litres, \$0.99/1000/litres.	A Price Adjustment Mechanism is applied monthly by the Water company to compensate for changes in the base rate due to: (a) Fluctuations in the Foreign Exchange Rate; (b) Changes in the Electricity Rate and (c) Movements in the Consumer Price Inflation Index.

Exchange rate:

1\$TT=US\$0.16

1Pound Sterling=US\$1.62

1\$J=US\$0.017

Note: UK prices for 2002/2003. Jamaica and Barbados prices as at end of 2003

Table 27
Cross Country Comparison of Tariffs for Metered Industrial Customers

Country/Utility			Industrial			
	Threshold point (Ml)	Standing Charges	USm³ (up to threshold point)	USm³ (over threshold point)	Other charges (\$US)	
Trinidad and Tobago	Nil	Nil	\$0.57		Industrial customers at the Point Lisas Industrial Estate pay a water improvement rate of \$0.65 per m ³	
United Kingdom (England and Wales)		<p>With a few exceptions (Anglian Water, United Utilities and Northumbrian) companies in the UK tend to base their standing charges (both water and sewerage) on meter size.</p> <p>Some of the fixed charges that apply are as follows: 1/2 inch- \$27.77 per year; 2 inches - \$107.40 per year; 8 inches- \$813.39 per year.</p>			<p>The following fixed charges also apply in addition to the normal standing charge based on meter size:</p>	
Severn Trent: Eco 20(May- Sept) (Oct- Apr)	10		\$1.30	\$1.43 \$0.92		\$1,621.74
Eco 20(May- Sept) (Oct- Apr)	20		\$1.30	\$1.59 \$0.81		\$1,621.74
Eco 50(May- Sept) (Oct- Apr)	50		\$1.30	\$1.23 \$0.61		\$14,978.20
Eco 250(May- Sept) (Oct- Apr)	250		\$1.30	\$1.05 \$0.52		\$31,141.60
Eco 250 plus(May- Sept) (Oct- Apr)	250		\$1.30	\$0.95 \$0.48		\$31,141.60
South West		Some of the fixed charges that apply are as follows: 1/2 inch \$27.58; 2 inches \$76.13; 5 to 20 inches - \$98.08 per year				
HW1	50		\$1.40	\$1.17		
HW2	100		\$1.40	\$0.98		
HW3	150		\$1.40	\$0.83		

Country/Utility			Industrial		
	Threshold point (Ml)	Standing Charges	USm³ (up to threshold point)	USm³ (over threshold point)	Other charges (\$US)
		Some of the fixed charges that apply in the Yorkshire area are as follows: 1/2inch - \$32.37; 2 inches - \$76.13; 4 inches - \$87.01; 6-20 inches - \$98.08. Some of the charges in York are as follows: 1/2 inch \$32.37; 2 inches - \$93.87; 6-20inches - \$424.04			
Yorkshire:					
Yorkshire -Band 1	50		\$1.31	\$0.81	
Band 2	250		\$1.31	\$0.69	
Interruptible band 1	0		\$1.31	\$1.26	
Interruptible band 2	50		\$1.31	\$0.76	
Interruptible band 3	250		\$1.31	\$0.64	
York					
Band 1	50		\$0.86	\$0.72	
Interruptible band 1	0		\$0.86	\$0.81	
Interruptible band 2	50		\$0.86	\$0.68	
Barbados	Nil		0.57 (US\$)		
					A Price Adjustment Mechanism is applied monthly by the Water company to compensate for changes in the base rate due to: (a) Fluctuations in the Foreign Exchange Rate; (b) Changes in the Electricity Rate and (c) Movements in the Consumer Price Index Inflation
Jamaica	Nil	Customers pay a fixed monthly service charge based on the size of their connection	0.41 (US\$)		

Exchange rate:

1\$TT=US\$0.16

1\$British Pound=US\$1.62

1\$J=US\$0.017

Note: Prices as at 2003

When the average tariff of US\$0.19 per cubic meter (water and sewerage) or the average tariff of US\$0.18 per cubic meter (water) in Trinidad and Tobago is compared to the countries illustrated in **Table 28** we see that the local tariff is the lowest.

Table 28
Water Pricing in Selected Countries

Country	US\$/M³
Germany	\$1.91
Denmark	\$1.64
Belgium	\$1.54
Netherlands	\$1.25
France	\$1.23
United Kingdom of Great Britain and Northern Ireland	\$1.18
Italy	\$0.76
Finland	\$0.69
Ireland	\$0.63
Sweden	\$0.58
Spain	\$0.57
USA	\$0.51
Australia	\$0.50
South Africa	\$0.47
Canada	\$0.40
Trinidad and Tobago*	\$0.18

Notes:

Source: Executive Summary of the World Water Development Report 2003 by the United Nations.

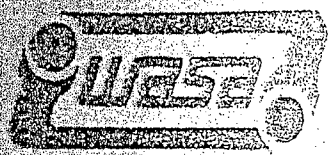
Figure for Trinidad and Tobago computed by RIC.

5.0 Conclusion

It is clear from the information presented that WASA's operational and financial performance is well below the internationally accepted level for a well performing water utility. Indeed, radical changes are needed if the Authority is to improve its performance.

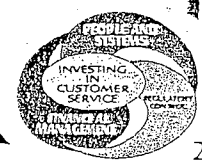
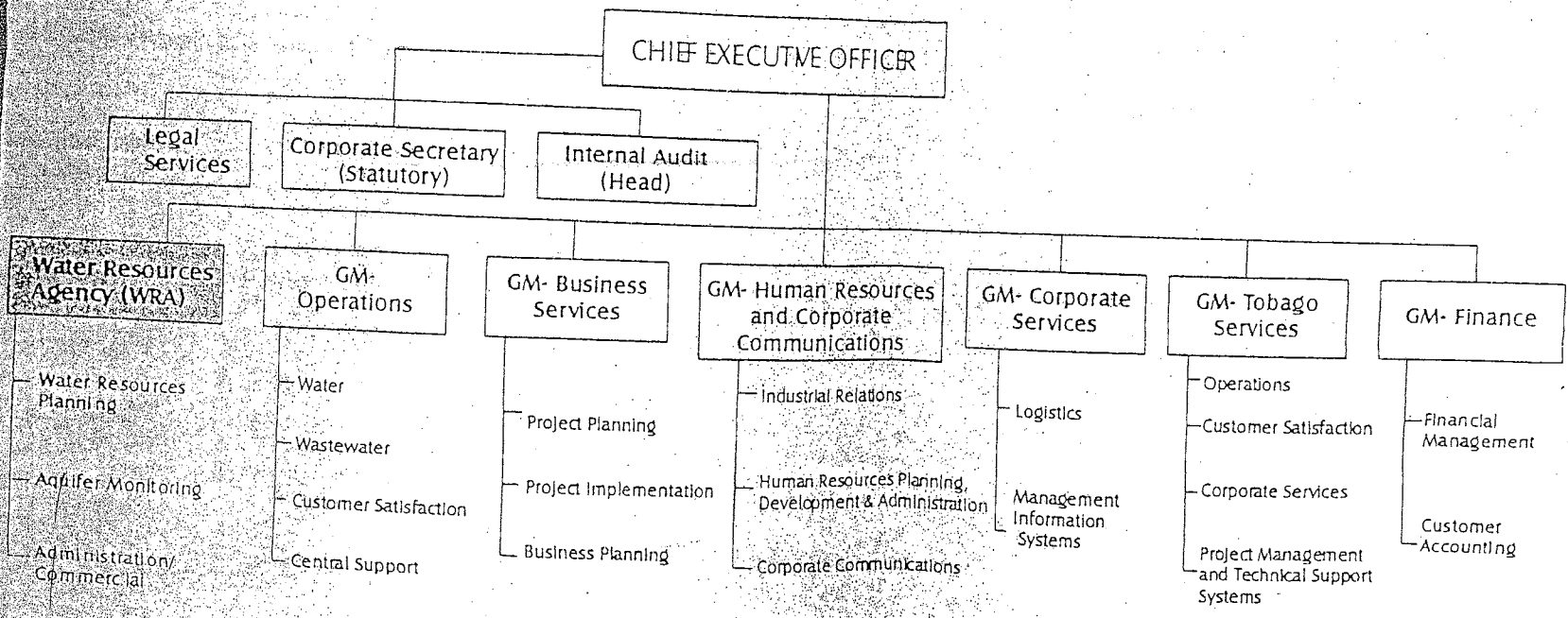
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- 5) Tynan N and B Kingdom (2002) *Effective Water Service Provision: Performance Targets for a well run utility*. World Bank, Washington D.C.
- 6) Water Regulation: Facts and Figures: April 2003. Office of Water Services.
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IMPLEMENTATION TEAM

NEW TOP MANAGEMENT STRUCTURE



A list of Areas in Receipt of a 24-hour Water Supply

Appendix 2

Town / Villa	Projected Population
	33
ANGLAIS Total	7659
ARANGUEZ Total	6042
ARIMA Total	1463
ARIMA BOROUGH Total	406
ARIPO HEIGHTS Total	6743
AROUCA Total	562
BAGATELLE Total	0
BALANDRA Total	940
BAMBOO GROVE NO.1 Total	1315
BAMBOO GROVE NO.3 Total	1637
BAMBOO SETTLEMENT NO.2 Total	10712
BARATARIA Total	5082
BEETHAM ESTATE Total	0
BEJUCAL Total	150
BELLE VUE Total	0
BELMONT Total	1303
BLANCHISSEUSE VILLAGE Total	130
BLONDELL ALLEY Total	77
BLUE RANGE Total	1018
BOISSIERE Total	1799
BON AIR GARDENS Total	751
BOURG MULATRESS Total	1597
BOURNES ROAD Total	0
BRASSO SECO VILLAGE Total	1127
CALEDONIA Total	4132
CANTARO Total	0
CAPARO Total	464
CARIB HOMES Total	98
CASABLANCA Total	21
CASCADE Total	63
CAURA Total	165
CENTENO Total	2062
CHAMP FLEURS Total	0
CHAMPS ELYSEES Total	0
CHINA TOWN Total	1389
CHINAPOO VILLAGE Total	794
CHRISTINA GARDENS Total	422
CLIFTON HILL Total	3353
COCONUT DRIVE Total	2058
COCORITE Total	556
CUMANA Total	237
CUMANA VILLAGE Total	1455
CUREPE Total	614
D'ADABIE Total	7768
DIAMOND VALE Total	997
DIBE ROAD Total	1121
DIEGO MARTIN Total	251
DUNDER HILL Total	7
DUNDONALD HILL Total	2987
EAST DRY RIVER Total	878
EASTERN QUARRY Total	

A list of Areas in Receipt of a 24-hour Water Supply

Town / Villa	Projected Population
EL DORADO Total	900
EL DORADO/MACOYA Total	1349
EL SOCORRO Total	13717
EL SOCORRO EXTENSION Total	3262
ELLERSLIE PARK/BOISSIERE Total	361
EMERALD GARDENS Total	54
FEBEAU VILLAGE Total	6485
FEDERATION PARK Total	357
FORT GEORGE Total	177
FOUR ROADS Total	226
GARDEN VILLAGE Total	955
GOLDEN GROVE Total	0
GRAN CURACAYE Total	2888
INDUSTRIAL ESTATE PANORAMA GAR Total	713
JOHN JOHN Total	1165
L'ANSE NOIR Total	442
LA CANOA Total	2240
LA MANGO VILLAGE Total	0
LA PASTORA Total	3097
LADY CHANCELLOR Total	0
LAS CUEVAS Total	403
LAS VEGAS Total	750
LAVENTILLE Total	4222
LAWRENCE PARK Total	734
LONG CIRCULAR Total	221
LOPINOT Total	787
MACOYA Total	2869
MAHOE Total	61
MAITAGUAL Total	837
MALABAR Total	3809
MALICK Total	2630
MALONEY Total	760
MAPPLAND Total	1690
MARACAS Total	215
MARACAS BAY Total	14
MARIE ROAD Total	290
MATELOT Total	587
MATURA Total	900
MATURITA Total	0
MAUSICA Total	480
MISSION Total	404
MON REPOS Total	456
MONTE GRANDE Total	1051
MONTE VIDEO Total	164
MORANG VILLAGE Total	535
MORVANT Total	7086
MT. DOR Total	2923
MT. HOPE Total	2065
MT. LAMBERT Total	2179
MT. PLEASANT Total	19
NEAL AND MASSY INDUSTRIAL Total	1313

A list of Areas in Receipt of a 24-hour Water Supply

Town / Villa	Projected Population
NETTOVILLE Total	642
NEVER DIRTY Total	555
NEWTOWN Total	1235
NHA Total	4652
OLTON ROAD Total	1806
OMEARA ROAD Total	397
OROPUNA VILLAGE Total	891
PARADISE GARDENS Total	9
PARADISE HEIGHTS Total	1688
PASEA EXTENSION Total	2957
PETIT BOURG Total	3556
PETIT CURACAYE Total	1550
PETIT VALLEY Total	1023
PICTON Total	766
PINTO Total	907
PINTO ROAD Total	575
PIPOL ROAD Total	975
POLICE BARRACKS Total	25
PORT OF SPAIN Total	4803
RAMPANALGAS VILLAGE Total	294
RED HILL Total	3422
RICH PLAIN Total	0
ROMAIN LANDS Total	108
SALYBIA Total	870
SAMAROO VILLAGE Total	1781
SAN BOUCAUD Total	1659
SAN JUAN Total	10461
SAN SOUCI Total	465
SANTA CRUZ Total	1310
SANTA CRUZ OLD ROAD Total	1356
SANTA MARGARITA Total	944
SANTA MONICA Total	331
SANTA ROSA Total	139
SAWMILL Total	749
SEALOTS Total	1663
SHERWOOD PARK Total	484
SILVER MILL Total	563
SOSCONUSCO Total	847
SOUTH VALSAYN Total	750
SPRING VILLAGE Total	3751
ST. AUGUSTINE Total	468
ST. AUGUSTINE SOUTH Total	894
ST. BARBS Total	884
ST. CLAIR Total	590
ST. HELENA VILLAGE Total	334
ST. JAMES Total	5125
ST. JOSEPH Total	4154
ST. LUCIEN ROAD Total	457
STREATHAM LODGE Total	1200
SUCCESS VILLAGE Total	2628
SUNSHINE AVENUE Total	749

A list of Areas in Receipt of a 24-hour Water Supply

Town / Villa	Projected Population
TOCO Total	1144
TOMPIRE Total	105
TRINCITY Total	637
TROUMACAQUE Total	4435
TUMPUNA ROAD Total	287
TUNAPUNA Total	2527
UPPER BOURNES ROAD Total	887
UPPER BUSHE STREET Total	905
UPPER SEVENTH AVENUE Total	6260
UPPER SHENDE STREET Total	751
UPPER SIXTH AVENUE Total	941
UPPER ST. FRANCOIS VALLEY ROAD Total	334
VALENCIA Total	47
VALLEY ROAD Total	0
VALSAYN NORTH Total	1356
WALLER FIELD Total	39
WATERHOLE Total	2168
WOODBROOK Total	5586

List of Areas in Receipt of 24-hour Water Supply

Town / Villa	Projected Poplation
AGOSTINI VILLAGE Total	2577
ARIPERO VILLAGE Total	1760
AVOCAT VILLAGE Total	1676
AVOCAT VILLAGE/MASSAHOOD Total	517
BACHYIA Total	114
BALMAIN Total	3559
BAMBOO VILLAGE Total	761
BASTER HALL Total	1154
BATCHYIA VILLAGE Total	1539
BEJUCAL Total	1339
BOIS BOURG Total	494
BORDE NERVE Total	205
BRASSO EMMANUEL JUNCTION Total	206
BRECHIN CASTLE Total	493
BRICKFIELD Total	320
BRICKFIELD NAVET Total	95
BROADWAY Total	1540
BROTHER'S ROAD Total	296
BROTHER'S SETTLEMENT/ST. JUL Total	221
BUCARRO Total	1926
BUEN INTENTO Total	602
BUTLER VILLAGE Total	1154
CALCUTTA ROAD NO.2 Total	1383
CALCUTTA SETTLEMENT NO.2 Total	90
CALIFORNIA Total	3456
CAPARO Total	1415
CARAPICHAIMA Total	4799
CARLSEN FIELD Total	1236
CEDAR HILL Total	851
CHAGUANAS Total	0
CHANDENAGORE Total	1467
CHARLIEVILLE Total	7160
CHARLO VILLAGE Total	69
CHASE VILLAGE Total	308
CHICKLAND Total	1070
CLARKE ROAD BARRACKPORE Total	5
CLAXTON BAY Total	2663
COCOYEA Total	4305
COCOYEA VILLAGE Total	4954
COFFEE STREET Total	684
CONGO HILL Total	0
COORA ROAD Total	554
CORINTH VILLAGE Total	774
COROMANDEL VILLAGE Total	223
COUVA CENTRAL Total	3939
CUMUTO Total	268
CUMUTO STRANGE VILLAGE Total	158
CUMUTO VILLAGE Total	62
CUNUPIA Total	1933
CUNUPIA VILLAGE Total	2645
DADES TRACE Total	185

List of Areas in Receipt of 24-hour Water Supply

Town / Villa	Projected Population
DEBE Total	2093
DELHI ROAD Total	105
DIAMOND Total	1082
DIGITY Total	153
DIGITY/MOHESS Total	0
DOW VILLAGE Total	6374
DUNCAN VILLAGE Total	1490
DUNCAN VILLAGE/PHILLIPINES Total	697
DYERS VILLAGE Total	283
ECCLESVILLE Total	88
EDINBURGH 500 Total	2265
EDINBURGH GARDENS Total	0
EDINBURGH VILLAGE Total	155
EMBACADRE Total	1205
ENDEAVOUR VILLAGE Total	1936
ENTERPRISE Total	11942
ESMERALDA Total	1720
ESPERANCE Total	307
ESPERANCE VILLAGE Total	1586
ESPERANZA Total	424
FAIRVIEW PARK Total	328
FELICITY Total	5587
FONROSE VILLAGE Total	290
FREEPORT Total	4665
FRIENDSHIP Total	294
FRIENDSHIP VILLAGE Total	1038
FYZABAD Total	1663
FYZABAD/LUMTAC HILL Total	596
GARTH ROAD/CORYAL VILLAGE Total	0
GEORGE VILLAGE Total	109
GOLCONDA VILLAGE Total	1340
GOODING VILLAGE Total	937
GRAN COUVA Total	594
GREEN ACRES Total	0
GULF VIEW Total	734
HARRIS VILLAGE Total	1306
HERMITAGE VILLAGE Total	414
HICKLING VILLAGE Total	387
HINDUSTAN SIXTH COMPANY Total	782
HOMELANDS GARDEN Total	1019
HOPE ROAD Total	159
INDIAN TRAIL Total	254
JERNINGHAM Total	2593
JERNINGHAM JUNCTION Total	754
KELLY VILLAGE Total	4254
KONJAL ROAD Total	221
LA BREA Total	762
LA BREA/CHINESE VILLAGE Total	512
LA FORTUNE Total	1973
LA GLORIA Total	245
LA ROMAIN Total	7195

List of Areas in Receipt of 24-hour Water Supply

Town / Villa	Projected Poplation
LANGE PARK Total	2466
LENDORE VILLAGE Total	2110
LES EFFORTS EAST Total	2590
LES EFFORTS WEST Total	1065
LONGDENVILLE Total	11037
LOS IROS Total	0
MACAULAY VILLAGE Total	396
MADRAS Total	88
MAMORAL Total	5
MAMORAL NO.2 Total	22
MARABELLA Total	60
MARAJ LANDS Total	22
MAYO Total	132
MC BEAN Total	1968
MC BEAN VILLAGE Total	2034
MOHESS ROAD Total	853
MOHESS VILLAGE Total	405
MON PLAISIR Total	2014
MON REPOS Total	8447
MONDESIR ROAD Total	888
MONROE SETTLEMENT Total	941
MONTROSE Total	2547
MONTROSE VILLAGE Total	2109
MUNROE SETTLEMENT Total	799
NANCOO VILLAGE Total	0
NAPARIMA HILL Total	1406
NAVET VILLAGE Total	984
NEW GRANT Total	1098
NORTH ROAD Total	451
OPLAY VILLAGE Total	605
ORANGE FIELD Total	1495
ORANGE VALLEY BAY Total	200
OROPUNA VILLAGE Total	0
PALMISTE Total	3474
PARADISE Total	4800
PASCALLE ROAD Total	102
PASCARR ROAD Total	108
PASEA EXTENSION Total	0
PENAL Total	861
PEPPER VILLAGE Total	110
PHILLIPINES Total	402
PHOENIX PARK Total	1036
PICTON Total	9
PLAISANCE Total	1119
PLAISANCE PARK Total	1318
PLATINITE VILLAGE Total	19
PLEASANTVILLE Total	12123
PLUCK ROAD Total	813
POINT COCO Total	25
POINT D'OR Total	205
POINT LISAS Total	5775

List of Areas in Receipt of 24-hour Water Supply

Town / Villa	Projected Population
POND TRACE Total	1190
POOLE Total	423
PREYSAL Total	3793
PRINCES TOWN Total	0
QUARTERS Total	690
RAGOONANAN ROAD Total	1807
RAMBERT VILLAGE Total	1649
RAMDHANIE VILLAGE Total	501
RAMI TRACE Total	351
RIVERS DALE GUARACARA Total	4
ROBERT HILL Total	277
ROBERT VILLAGE Total	43
ROCHARD ROAD Total	593
ROCK ROAD Total	85
ROUSILLAC Total	905
ROUSILLAC/GRANT Total	0
SAN FERNANDO Total	3127
SAN FRANCIQUE Total	334
SAN FRANCIQUE VILLAGE Total	1173
SAN FRANCIQUE/PLUCK ROAD Total	420
SAN PEDRO Total	0
SANCHO Total	1415
SANKARLAL LANDS Total	36
SIEWDASS ROAD Total	643
SIGN VILLAGE Total	13
SIPARIA Total	297
SISTER'S ROAD' Total	0
SIXTH COMPANY Total	180
SOBO VILLAGE Total	411
SOLEDAD VILLAGE Total	197
SOMAI TRACE Total	713
SOOKOO Total	317
SOUTH OROPOUCHE Total	1843
SPRING VILLAGE Total	1137
SPRINGVALE Total	935
ST. ANDREW VILLAGE Total	2325
ST. CHARLES Total	1
ST. CHARLES VILLAGE Total	987
ST. CLEMENT Total	65
ST. HELENA VILLAGE Total	2745
ST. JOHN VILLAGE Total	1359
ST. JULIEN Total	245
ST. MARGARET VILLAGE Total	814
ST. MARY'S VILLAGE Total	2478
ST. MARY'S, FREEPORT Total	1155
STONE ROAD MORICHAL Total	0
SUCHIT ROAD Total	1518
SYFOO Total	191
SYFOO/COROMANDEL Total	159
SYNE VILLAGE Total	179
TABAQUITE Total	2894

List of Areas in Receipt of 24-hour Water Supply

Town / Villa	Projected Poplation
TESERO Total	50
THICK VILLAGE Total	796
TIMITAL Total	565
TODD'S ROAD Total	449
TOROUBA Total	858
TORRIB TRACE Total	777
TULSA VILLAGE Total	652
UNION VILLAGE Total	925
UNION/ST. MARGARET VILLAGE Total	696
UPPER SISTER'S ROAD Total	990
UPPER/LOWER HILLSIDE Total	586
VICTORIA VILLAGE Total	1339
VISTABELLA Total	15161
WARREN VILLAGE Total	2586
WATERLOO Total	1346
WATTS TRACE Total	41
WELCOME Total	753
WELL ROAD Total	465
WELLINTON Total	556
WHITELAND Total	283
WOOD LAND Total	538

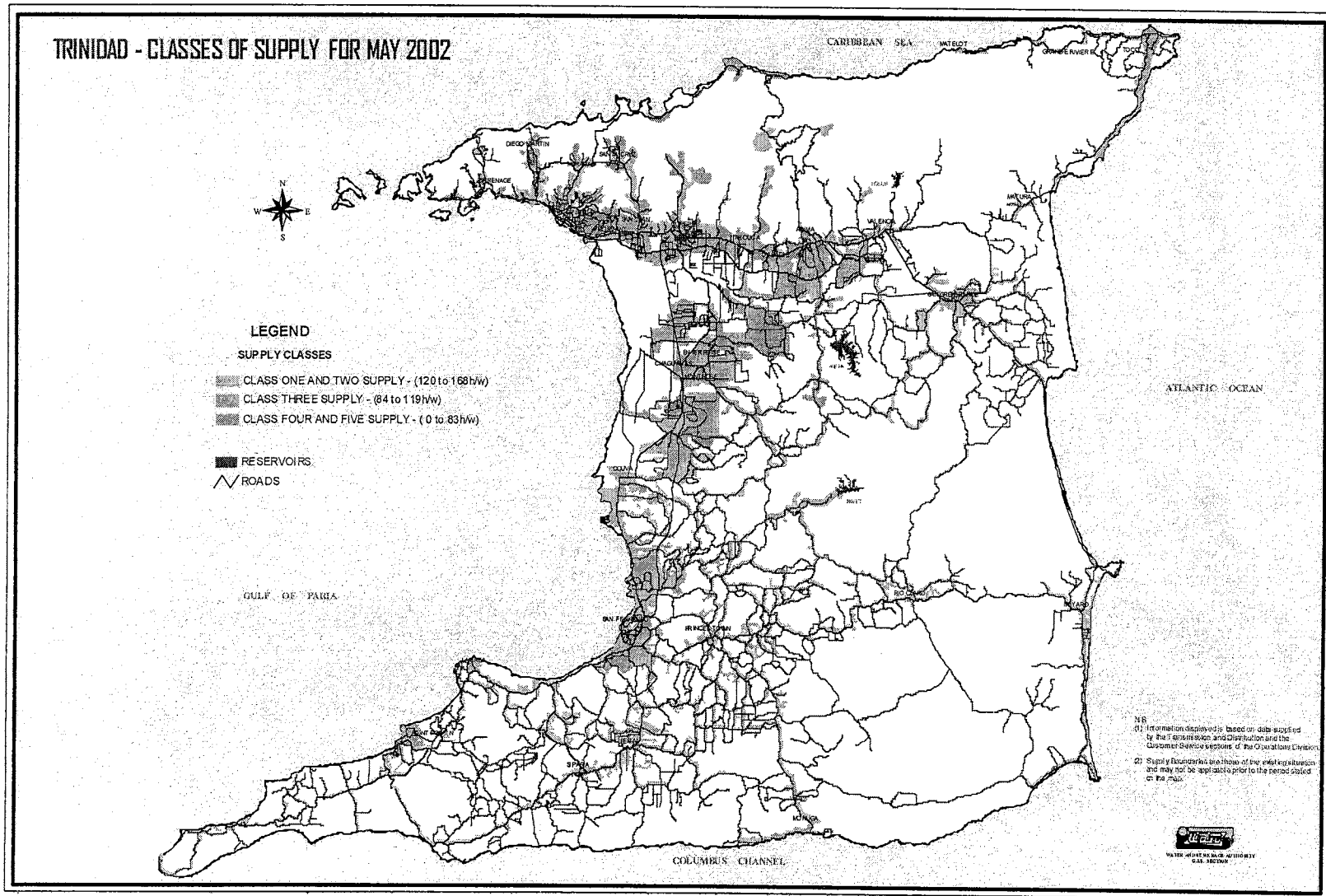


TABLE I

WATER AND SEWERAGE AUTHORITY
ANALYSIS OF OUTSTANDING LONG-TERM DEBT
AT 2003 JANUARY 31

Appendix IV

	Particulars	Lender	Year of Borrowing	Type of Loan	Principal		Interest			Tenor (Yrs.)	Refinanced		
					Original	Current	Fixed	Floating				Variable	
							Rate	Base	Rate			Rate	Period (Yrs.)
VASA-SERVICED DEBT:													
1	IOA Zero-coupon	Citibank	1996	Bond	\$341,912,200	\$456,419,000				13.1% 11.75%	1 - 1.5 1.5 - 20	20	Yes
2	VESP	RMB ¹	1998	Bond	92,415,769	99,327,195	11.75%					25	Yes
3	South Water Loan - I		1998	Bond	300,000,000	354,782,658	11.50%					20	In Negotiation
4	South Water Loan - II	FINCOR TTUTC ²	1999	Bond	343,000,000	403,364,940	11.45%					20	In Negotiation
5	North Water Loan - I		2000	Bond	330,000,000	411,867,787	11.40%					20	No
6	North Water Loan - II		2000	Bond	\$330,000,000	\$377,412,659	11.50%					20	No
Total WASA-Serviced Loans					\$1,737,327,969	\$2,103,174,239	\$1,646,755,239	\$0		\$456,419,000			
GORTT-SERVICED DEBT:													
1	Water Sector Institutional Strengthening: Concessionary Loan Counterpart Funds	IADB ³ GORTT	1989	Bond	\$118,944,853 <u>58,057,726</u> <u>177,002,579</u>	\$118,944,853 <u>58,057,726</u> <u>177,002,579</u>	8.76%					20	No
2	T'ngo. L'ward/Rural Project: Concessionary Loan Counterpart Funds	CDB ⁴ GORTT	1990	Bond	16,350,436 <u>18,149,558</u> <u>34,499,994</u>	16,350,436 <u>18,149,558</u> <u>34,499,994</u>	9.30%					20	No
3	Work. Cap. Finance Series A	FCB	1990	Bond	11,450,000	10,608,342		Prime	>1.5%			20	No
4	Work. Cap. Finance Series B	FCB	1990	Bond	43,550,000	40,346,228		Prime	>1.0%			20	No
5	Work. Cap. Financing	FINCOR	1991	Bond	50,000,000	50,000,000		RBR ⁵	>1.5%			20	No
6	VESP Financing (pre-IOA)	FINCOR	1993	Bond	78,600,000	63,694,093		Avg. Prim	>3.5%			20	No
Total GORTT-Serviced Loans					\$395,102,573	\$376,151,236	\$211,502,573	164,648,663		\$0			
Total WASA Long-Term Debt					\$2,132,430,542	\$2,479,325,475	\$1,858,257,812	\$164,648,663		\$456,419,000			

¹ Royal Merchant Bank Ltd. ² Trinidad and Tobago Unit Trust Corporation ³ Inter-American Development Bank
⁴ Republic Bank Base Rate ⁵ Amt. drawn down at 2003 January 31

⁴ Caribbean Development Bank

TABLE II

WATER AND SEWERAGE AUTHORITY
ANALYSIS OF OUTSTANDING SHORT-TERM DEBT

AT 2003 JANUARY 31

SHORT-TERM DEBT:					Principal		Interest Rates						
		Particulars	Lender	Year of Borrowing	Curr.	Loan Limit	Amount Drawn ⁶	Fixed Rate	Floating			Variable	
									Base	Rate		Rate	(Yrs.)
1	Desalinated Water Facility	Republic	2002	TT\$	\$189,000,000	\$100,457,097	11%	Prime	>0.5%			Convertible to long-term	
2	Commercial Paper	Republic	2002	TT\$	200,000,000	200,000,000						To be rolled over.	
	Republic Overdraft	Republic	1999	TT\$	200,000,000	220,343,202						To be paid off.	
4	Citibank Overdraft	Citibank	1998	TT\$	30,000,000	30,231,975						To be paid off.	
Total Short-term Loans					\$619,000,000	\$551,032,274	\$200,000,000	100,457,097					

Note:

1. Desalinated Water Facility is a US\$ loan valued at \$30,000,000.

WATER AND SEWERAGE AUTHORITY
TOTAL CAPITAL EXPENDITURE
FOR THE PERIOD 1995 - 2002

DETAILS OF FUNDING	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002	TOTAL
<i>Expenditure funded through Gov't DP/PSIP/THA</i>			40,533,086	42,535,539	83,259,745	13,386,959	5,318,265	185,033,595
<i>Capital Expenditure funded through Loans:</i>								
<i>World Bank - (WSSRP; STSP; WSIS)-Note 1</i>	80,086,036		6,453,336	24,042,291	8,363,190			118,944,853
<i>Caribbean Development Bank (CDB) Note 1</i>			21,873,402	5,301,497	7,325,095			34,499,994
<i>South Water Project (SWP)</i>				31,005,656	596,513,542	23,024,263	1,318,363	651,861,824
<i>North Water Project 1 (NWP 1)</i>					57,040,204	194,921,733	63,447,343	315,409,281
<i>North Water Project 2 (NWP 2)</i>						5,012,046	135,101,984	140,114,031
	80,086,036		28,326,738	60,349,444	669,242,031	222,958,042	199,867,691	1,260,829,982
<i>Other Capital Expenditure Externally funded:</i>								
<i>Rechargeable</i>			4,285,402	3,365,115	77,318		18,593,882	26,321,716
<i>Capital Expenditure Internally funded</i>	7,263,629	10,095,259	23,855,749	35,816,873	12,461,917	18,217,986	14,768,310	122,479,724
Total Capital Expenditure	87,349,665	10,095,259	97,000,975	142,066,971	765,041,011	254,562,987	238,548,147	1,594,665,017

NOTES:

1. These represent funds on lent to the Authority as the executing agency, by the Central Government who signed the principal loan agreement with the external funding agency. However, no formal loan agreement was concluded between GORTT and the Authority.
2. Rechargeable Funds are amounts received from third parties (eg. Ministries) as a Contribution towards specific projects.

Appendix VI

Tariff Structure in other Countries

In this Appendix we look at the structure in the United Kingdom, Jamaica and Barbados were examined. The UK provides an example of a developed country scenario, where the tariff structure more closely reflects the economic cost of production. Jamaica and Barbados provide examples of other Caribbean territories with similar problems in respect of their own water sectors.

a. United Kingdom

In the United Kingdom, the Office of Water Services (Ofwat) is responsible for regulating the prices charged for water and sewerage services by companies in England and Wales. This is done by setting a limit (known as the k factor) on the average increase in charges that a company can impose in any year. There are currently twenty-three water and sewerage companies in England and Wales. Ofwat set the last price limits in 1999 for the period 2000-05. The actual formula for applying price limits is $RPI + K + U$. RPI measures inflation and is the percentage increase in the Retail Price Index in the year to the November before the charging year that begins on 1 April. K is the price limit Ofwat sets for each company, for each year. U is any amount of K not taken up in the previous years¹.

Ofwat (May 2003) has indicated that the Industry Average household bill for water for 2002-2003 is £111, and the Industry Average household bill for sewerage is £125. Customers are billed on a monthly basis.

b. Jamaica²

The National Water Commission (NWC), the Urban Development Corporation and Parish Councils are the key providers of potable water in Jamaica, with the NWC supplying the major portion. The NWC is the major provider of sewerage services. The rates and charges for water and sewerage are computed on the following basis:

- Water Rates are fixed in accordance with the use of the property i.e. Domestic, Commercial/industrial, and Condominium;
- Sewerage Rates are 100% of the water charges for all customers served by the NWC;
- All customers pay a fixed monthly service charge based on the size of their connection, which varies from 5/8 inch to 6 inches, e.g. 5/8 inch or 15 mm - J\$101.65, 3/4 inch or 20mm - \$J 208.65, 1 inch or 25mm – J\$272.86, 1 1/4 inch or 30mm j\$513.61, 6 inch or 150mm - J\$3,252.86 (highest amount);
- The Volumetric rates are as follows:

¹ Ofwat, **Tariff structure and charges, 2002-03 report**, May 2002

² As at the end of 2003.

Domestic (imperial metered):

For up to 3,000 gallons	J\$57.96/1,000 gallons
For the next 3,000 gallons	J\$102.18/1,000 gallons
For the next 3,000 gallons	J\$110.32/1000 gallons
For the next 3,000 gallons	J\$140.81/1000 gallons
For the next 8,000 gallons	J\$175.37/1000 gallons
Over 20,000 gallons	J\$225.73/1,000 gallons

Domestic (metric metered):

For up to 14,000 litres	J\$12.75/1,000 litres
For the next 13,000 litres	J\$22.48/1,000 litres
For the next 14,000 litres	J\$ 24.27/1,000 litres
For the next 14,000 litres	J\$30.97/1000 litres
For the next 36,000 litres	J\$38.58/1000 litres
Over 91,000 litres	J\$49.65/1000 litres

Consumers (unmetered)

Rates in accordance with Special Contract

Commercial and Industrial:

Imperial metered J\$217.33 per 1,000 gallons

Metric metered J\$47.81 per 1,000 litres

Condominiums:

Imperial metered J\$107.81 per 1,000 gallons

Metric metered J\$23.71 per 1,000 gallons

- A Price Adjustment Mechanism is applied monthly by the NWC to compensate for changes in the base rate due to:
 - Fluctuations in the Foreign Exchange Rate;
 - Changes in the Electricity Rate; and
 - Movements in the Consumer Price Index (inflation rate).

c. **Barbados**³

In Barbados, the management of water resources and the pumping and distribution of water is undertaken by the Barbados Water Authority (BWA). The BWA is also responsible for water abstraction licensing, water resources aspects of new planning applications and water resources. It is a statutory organization and operates as a monopoly. There are three Customer Classes, which include

³ As at the end of 2003.

Domestic (metered and unmetered), General non Domestic and Ships. The rates are as follows:

Un-metered Domestic Customers:
Annual Rateable Value of Property

Metered Domestic Service

0-34 m ³ per month	B\$1.50/m ³
Over 34 m ³	B\$2.12/m ³

General Non-Domestic

All volumes	B\$1.12/m ³
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Ships

All volumes	B\$3.50/m ³
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