PRICING FOR THE POOR-
AN EVALUATION OF WATER SUBSIDIES IN TRINIDAD AND TOBAGO

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Table of Contents

List of Tables

Abstract

Increased access to adequate, potable and high quality water and sewerage services, and affordability for the poor must be a cornerstone of any policy to achieve economic development and eradicate poverty. Despite a relatively high percentage of poor households being connected to the water and sewerage network utility in Trinidad and Tobago, the poor suffer from a discontinuous, insufficient supply of water that is often of poor quality. Furthermore, the overall costs of connecting to the network are high relative to what poor customers can afford.

The Government of Trinidad and Tobago has recognized that without subsidies some households would have difficulty connecting to the network and paying their bills and as such has implemented various subsidy schemes. Although it is recognized that utility subsidies may be essential in making water and sewerage services affordable for the poor, there has been a growing consensus, in recent times, that the poor rarely in fact benefit from broadly based subsidy schemes, which often continue long after they are useful. In Trinidad and Tobago, poor, rural households often receive the lowest levels of supply, if any, and therefore must resort to the use of various coping mechanisms to supplement deficiencies in water supply and pressure.

This paper presents an evaluation of water subsidy schemes in terms of their success in reaching the poor in Trinidad and Tobago. Recommendations are also made as to what regulatory strategies are available to ensure that water utility subsidy schemes are "pro-poor".

Introduction

In Trinidad and Tobago, water and wastewater services are provided solely by a monopoly provider that is a vertically integrated, Government-owned and operated statutory Authority. The Water and Sewerage Authority (WASA)[1] is the monopoly provider with private sector involvement limited to contracted services and out-sourcing of certain activities. The Regulated Industries Commission (RIC) is the economic regulator for the Water and Wastewater Sector in Trinidad and Tobago.

The majority (65 percent) of WASA's production comes from surface sources, with the remaining 25 percent and 10 percent produced from groundwater and desalination, respectively. In 2006, 365 million cubic meters (m^3) of potable water were produced. The water supply has been consistently lower than demand, despite increasing production over the last decade[2].

WASA has been unable to fulfill its main mandate of providing a reliable supply of water to its customers, of expanding the service into new areas and of upgrading its existing areas. In fact the level of the cost of service provision has been increasing rapidly without any sign of increase either in the service quality or the organization's productivity, with both of these aspects actually deteriorating during the period.

The utility is poorly operated and managed as shown by malfunctioning of the supply and distribution system, and severe economic and financial constraints. Routine maintenance has been neglected, resulting in the rapid deterioration of existing facilities. There is no programme of systematic rehabilitation of old transmission and distribution pipelines and pipe repair techniques are inadequate, thereby leading to high levels of UFW and

[1] WASA operates under the Water and Sewerage Act, Chapter 54:40 of 1965, with amendments.
[2] To deal with insufficient supply, WASA entered into a water sale agreement with the Desalination Company of Trinidad and Tobago Ltd. (Desalcott) in 1999.

frequent interruptions in the water supply. Furthermore, all these deficiencies have added to high operating and maintenance costs.

Low water and sewerage tariffs are insufficient to offset operating costs, provide funding for routine maintenance and system upgrading and expansion of the service. Additionally, WASA's outdated and inaccurate customer data with poor collection and cost recovery procedures has eroded its revenue-generating capacity, maintenance of capital stock and long-term planning initiatives. The passive disconnection policy has only served to make delinquent customers unwilling to pay and to treat water as a "free" good rather than an economic good.

WASA is saddled with high staffing levels and as a result high operating costs, as indicated by high employees per connection ratios, high ratio of population to staff, high labour cost per employee and a high ratio of labour cost to total costs and contracting costs. The ratio of labour cost to total operating expenses is now approximately 49%, compared with about 30% for well-run utilities. High personnel costs and low productivity are making the improvement of water service in the country an impossible task, as so little of the total operating budget is left to undertake system maintenance. Customer confidence in WASA's ability to provide a better service has been eroded. Major restructuring is seen as a panacea to the water problems faced by customers.

Funding of water subsidies has placed a heavy burden on the government, costing over TT$ 5.5 billion over the last 4 years. Operating deficits recorded annually by WASA are being subsidized by the State. However, such general subsidy is neither sufficient nor timely and provides no incentives to WASA to perform efficiently. Government subventions to WASA make up the largest portion of water subsidies totaling TT$ 5.2 billion from 2005-2008.

According to WASA, 92 percent of the country's population has access to a water supply[3] and approximately 21.3 percent of the population is served by its sewerage facilities[4]. Private plants service a further 10 percent of the population. The remaining population utilizes septic tanks (50.3 percent) and pit latrines (26.8 percent).

The Analysis of the Trinidad and Tobago Survey of Living Conditions (SLC) 2005,[5] published by Kairi Consultants Ltd., shows that 84.3 percent of the population has access to a water supply, using the definition of water coverage provided by WASA. However only 71.2 percent of the poorest households have access to a utility provided water supply compared to 91.5 percent of the richest households. Table 1 shows that the likelihood of public piped water to dwelling increased with housing quintile; 47.8 percent of those in the poorest quintile had water piped by the utility to the dwelling compared to 87.3 percent of those in the richest quintile. As much as 5.9 percent of all households sampled still depended on public standpipes, with 11.5 percent of the poorest quintile relying on this source. 15.7 percent of the poorest households pay for a private water supply with large proportions of the two lowest quintiles relying on unsafe sources of supply, such as springs/rivers or 'other' sources of water supply.

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3 Water Coverage is defined by WASA 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. Best practice in this area is 100% and 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.

[4] Sewerage Coverage is defined by WASA 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.

[5] The SLC involved the selection of a random sample of 3,621 households drawn from the Enumeration Districts in the Municipal Corporations across Trinidad and from Tobago. These households were comprised of 12,919 persons, who, on the basis of population updates, represented one percent of the population. The SLC 2005 calculated a Poverty Line of household monthly income of TT$665. and found that 11% of households in Trinidad and Tobago live below the poverty line with 16.7% of individuals in Trinidad and Tobago living below the poverty line.

Table 1: Distribution of Dwellings by Main Source of Water by Quintiles

Main Source of Water	Household Quintiles[6]					
	Poorest	II	III	IV	Richest	Total
	%	%	%	%	%	%
Public piped into dwelling	47.8	66	71.7	79.8	87.3	70.7
Public piped into yard	11.9	7.8	8.4	6.2	1.6	7.7
Public Standpipe	11.5	6.3	6.1	3.5	2.6	5.9
Private piped into dwelling	4.7	5.8	4.7	3.9	3	4.4
Private Catchment not piped	11	6.6	3.7	3.5	2.1	5.4
Truck borne	3.9	2	0.9	1	1.7	1.9
Spring/River	2	0.9	1.8	0.6	0.1	1.1
Other	7	4.4	2.5	1.5	1.4	3.3
Not Stated	0.2	0.3	0.1		0.1	0.2
Total	100	100	100	100	100	100
Total (n)	834	847	855	854	869	4258

Source: Analysis of the Trinidad and Tobago Survey of Living Conditions 2005. Kairi Consultants Ltd.

The SLC 2005 also shows that 18.3 percent of households were connected to a sewer system. However only 9 percent of the poorest households were connected compared to

[6] Households were ranked by per capita consumption expenditure and then grouped into five groups or quintiles. For the poorest group, monthly household expenditure ranged from TT $127. to TT $884. and for the richest group, monthly household expenditure ranged from TT $2,921. to TT $59,779.

28.9 percent of those in the richest quintile. The poorest households primarily rely on septic tanks/soak aways and pit latrines to satisfy their sanitation needs. Table 2 shows a detailed analysis of the sanitation facilities that are utilized by various households in Trinidad and Tobago.

Table 2: Type of Toilet Facilities used by Households Storing water by Quintile

Type of Toilet Facility	Household Quintiles					
	Poorest	II	III	IV	Richest	Total
	%	%	%	%	%	%
WC Linked to Sewer	9.0	12.5	17	23.5	28.9	18.3
Septic Tank/Soak away	48.1	65.6	67	66.6	65.5	62.6
Pit/Latrine	41.6	21.6	15.5	9.5	4.9	18.4
Other	-	-	0.1	-	-	0
None	1.1	0.3	0.3	0.4	0.7	0.6
Not Stated	0.2	-	-	-	-	0
Total	100	100	100	100	100	100

Source: Analysis of the Trinidad and Tobago Survey of Living Conditions 2005. Kairi Consultants Ltd.

It is clear that there is not full water coverage in Trinidad and Tobago, with lower income groups suffering from poor access more frequently than upper income groups. The problem of access is more acute in rural communities as many in these areas are still, comparatively speaking, underserved with water and sewerage services. It is evident that there is a challenge in the provision of water and sanitation services to poor households in Trinidad and Tobago.

Poor households also suffer from an inadequate supply of water. According to WASA, only 18% of the population served had a 24-hour supply[7] at the end of 2006. Thus, approximately 82% of the population received a scheduled supply. The poor are further disadvantaged by the fact that in the rural areas, where the majority of the poor live, WASA has utilized extensive scheduling in order to provide water. Notably, certain areas have received significantly lower levels of supply than others. WASA's data indicate that some customers living within Siparia, Mayaro/Rio Claro, Penal/Debe, Point Fortin, Princes Town and the Couva/Tabaquite/Talparo Regional Corporations, receive a Class 5 supply (a supply of less than 48 hours per week). These are the so called, "Brown Areas" and are shown in Table 3. It can be clearly seen that a higher percentage of the population in the north of the country receive a much better level of supply than the south, whereby as much as 73% of the City of Port-of-Spain's population receive a 24/7 supply compared with as little as 23% in the Borough of Point Fortin.

[7] 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.

Table 3: Supply by City, Borough and Regional Corporation

City/Borough/ Regional Corporation	Percentage of Population	
	Continuous Supply	Less than twice per week
Siparia	37	21
Mayaro/Rio Claro	32	18
Penal/Debe	44	15
Point Fortin	23	15
Princes Town	39	14
Couva/Tabaquite/Talparo	44	12
Port-of-Spain	73	7
Diego Martin	52	7
San Juan/Laventille	60	4
Arima	62	3
San Fernando	33	2
Tunapuna/Piarco	68	2
Chaguanas	74	1
Sangre Grande	81	1
Totals	55	8

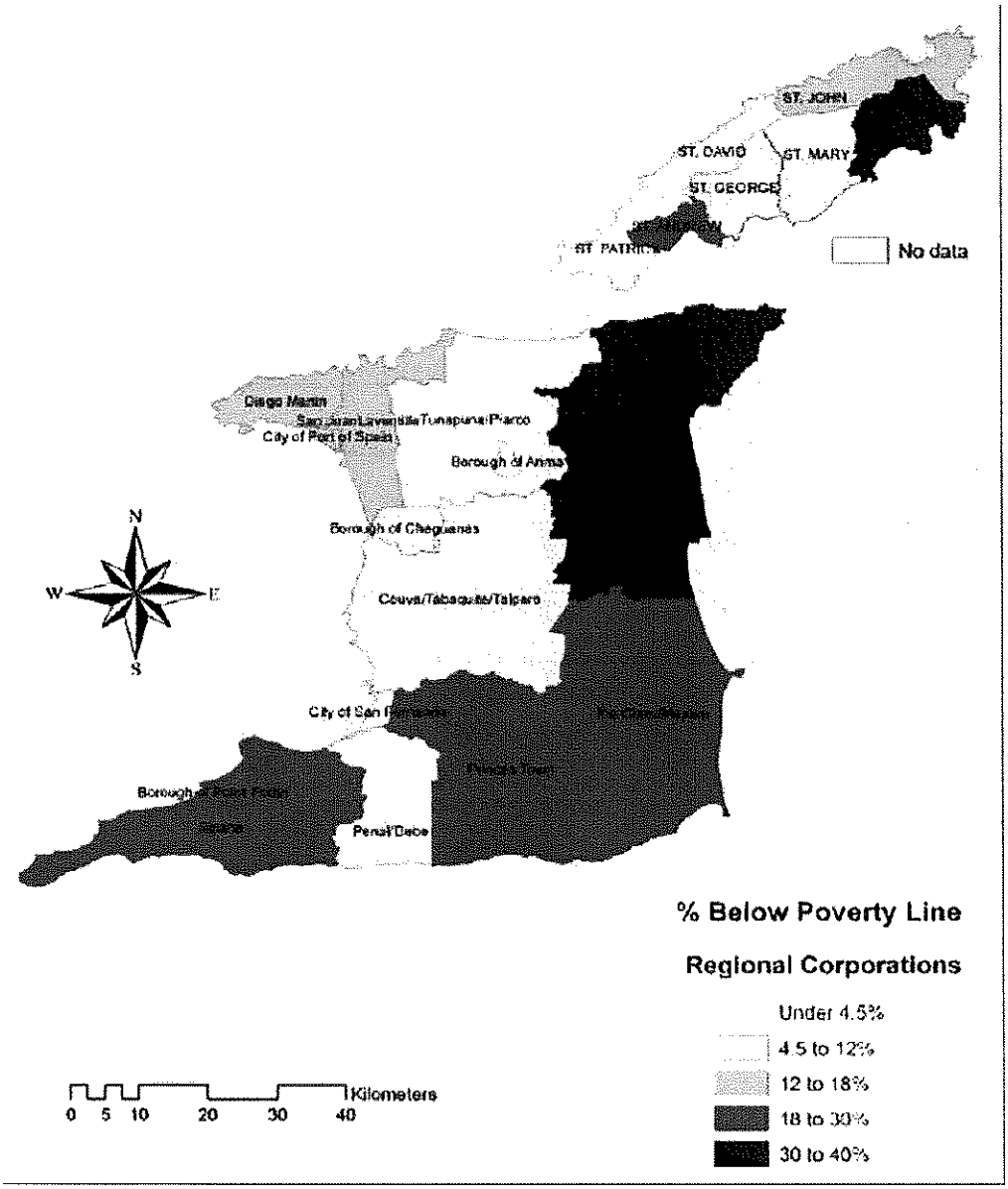
Source: Calculated using 2000 Census Data from the Central Statistical Office

It is interesting to note that in many of these "Brown Areas", high levels of poverty exist. Map 1 shows that the highest level of poverty[8] in the country is found in the Sangre

[8] Number of poor persons per 100 in the population of the regional corporation used to determine the prevalence of poverty in the Survey of Living Conditions, 2005.

Grande Regional Corporation, which embraces the north-east of Trinidad, where 39.1 percent of the population there was deemed to be poor. Princes Town, Mayaro/Rio Claro and Point Fortin also have a high prevalence of poverty and are all "Brown Areas".

Map 1: Geographic Distribution of Poverty in Trinidad and Tobago



Source: Analysis of the Trinidad and Tobago Survey of Living Conditions 2005. Kairi Consultants Ltd.

The SLC 2005 further shows that the poorest households receive the worst supply of water. Table 4 shows that 47.8 percent of the poorest households receive a scheduled supply while only 35.9 percent of the richest households do not have a continuous supply. 9.8 percent of the poorest households receive less than 48 hours of supply compared to 4.1 percent of the richest households.

Table 4: Frequency of Pipe Borne Water Supply by Quintiles

Frequency of Water Supply	Household Quintiles					
	Poorest	II	III	IV	Richest	Total
	%	%	%	%	%	%
Continuous Supply	52.2	53.8	59.1	62.5	64.1	58.4
Three or more Times Weekly	17	20.4	20.6	21.4	21.3	20.1
Twice Weekly	9	9.3	7.6	5.4	5	7.3
Less than Twice a Week	9.8	8.6	7.1	6.5	4.1	7.2
Other	11	6.7	5.3	3.7	4.5	6.2
Not Stated	0.9	1.2	0.3	0.6	0.9	0.8
Total	100	100	100	100	100	100

Source: Analysis of the Trinidad and Tobago Survey of Living Conditions 2005. Kairi Consultants Ltd.

However it is interesting to note that the Willingness to Pay Survey published by the RIC in 2005 produced different results on the reliability of water service in Trinidad and Tobago. Table 5 shows these results. Only 24 percent of low income households receive a 24 hour, 7 day a week supply of water. 50 percent of these households receive a water supply 2 days or less for the week.

Table 5: Service Class by Income Group

Income Group	Class I	Class II	Class III	Class IV	Class V
	168 hours per week	120-168 hours per week	84-120 hours per week	48-84 hours per week	0-48 hours per week
	%	%	%	%	%
Low < TT$1,500. per month	24	6	10	10	50
Middle TT$1,500. to TT$5,500. per month	26	8	13	13	40
Upper > TT$5,500. per month	45	7	14	5	29

Source: The Willingness to Pay for Changes in Water, Wastewater and Electricity Services in Trinidad and Tobago, March 2005, Regulated Industries Commission.

As a result of this scheduling of the water supply, households in T&T have invested in a number of storage facilities at their homes. The type of storage facility used by the quintile is shown in Table 6. It can be seen that richer households tend to invest in water tank storage facilities and rarely rely on barrels for storage. However 40.3 percent of the poorest households use barrels, often along with the use of water tanks. This presents a further financial burden on these poor households who must now put out relatively large sums of money to supplement their inadequate water supply.

Table 6: Type of Water Storage Facility by Quintiles

Frequency of Water Supply		Household Quintiles					
		Poorest	II	III	IV	Richest	Total
		%	%	%	%	%	%
Water Tank	N	524	572	594	624	656	2969
	%	72.6	79.8	82.8	88.6	91.3	83
Barrel	N	290	190	136	91	62	768
	%	40.3	26.5	18.9	12.9	8.6	21.5
Other	N	99	69	71	46	38	324
	%	13.8	9.6	9.9	6.6	5.3	9.1

Source: Analysis of the Trinidad and Tobago Survey of Living Conditions 2005. Kairi Consultants Ltd.

It is important to note that poor households often use unsafe drinking water. In 2000, a cross-sectional study[9] was conducted in four rural communities of northeastern Trinidad to determine the microbial quality of water supply to households and that quality's relationship to source and storage device. The study concluded that that the drinking water in rural communities in Trinidad was grossly unfit for human consumption, due both to contamination of various water sources and during household water storage.

Increased access to adequate, potable and high quality water and sewerage services and affordability of these by the poor must be a cornerstone of any policy to achieve economic development and eradicate poverty. It is clear that the poor in T&T are at a disadvantage as they have lower access rates, receive low levels of supply and utilize water that is of poor quality.

[9] Welch et al. September 2000. Pan American Journal of Public Health

In 2000, the United Nations set out a number of Millennium Development Goals that would free a major portion of humanity from the shackles of extreme poverty, hunger, illiteracy and disease, if achieved. Access to safe water has been recognized as a necessary condition for an acceptable quality of life and for the eradication of extreme poverty and as such has been declared as a "derivative right" by the UN. In achieving its goal to ensure environmental sustainability, the UN set a target that by 2015 we must halve the proportion of the population without sustainable access to safe drinking water and basic sanitation.

The Government of the Republic of Trinidad and Tobago (GORTT) has also recognized the plight of the poor and the importance of investing in sound infrastructure and the environment so as to fight poverty and achieve development. Therefore as part of its Vision 2020 Operational Plan, to achieve development status by the year 2020, it has set a target to increase pipe borne water coverage from its current level of 92 percent to 98 percent in 2014. Furthermore, the GORTT will ensure the efficient development of the water and sewerage sector so that at least 75 percent of the population has centralized sewerage coverage by 2020 and 98% of the population has 24hour continuous supply of water by the year 2014.

In achieving these goals, the GORTT has recognized that low income households and the vulnerable in society may be face challenges to connect to the water and sewerage network and consume an adequate amount of water, as these costs are high relative to what poor customers can afford. As such it has implemented various subsidy schemes to improve access and affordability by the poor.

The RIC Act under Section 6 (3) (a to d) mandates the RIC to have regard to equal access by consumers to service and in respect of consumers similarly placed, to non-discrimination in relation to access, pricing and quality of service. Therefore, the RIC, as the regulator of WASA, must attempt to ensure that there is an improvement in access

rates and service quality for the poor customers. The RIC Act also mandates the RIC to have regard to the ability of consumers to pay rates. Regulators must ensure that the connection charges and tariffs paid by households, in particular, the low income households, are as affordable as possible.

Rationale for Subsidizing Utility Services for the Poor

Universal Access to a Basic Level of Service

Utility subsidy schemes are often implemented to ensure that all households have access to a basic level of service. In the case of water and sewerage services, there is a health benefit attached to the provision of these services that extend beyond the members of the households receiving these services and to the population as a whole, i.e. public benefit of universal access. Better health, averted health care costs and time saved will all result from universal access to basic water and sanitation services. It is generally recognized that due to health, sanitation and environmental considerations, water has to be supplied to individuals who are unable to pay the full cost of the service at a subsidized price.

Promote Affordability

Special pricing and service arrangements for the poor are often developed so as to make water services affordable to them. These arrangements attempt to balance quality, price levels, and payment schemes so that the needs of the poor can be met. If customers were to pay the price that represents the economic cost of providing these services, the poor may face a challenge in doing so. Subsidies allow for utility connection and consumption charges to be set artificially low so that low income households can now access and afford these services. The poor is now able to connect to the utility and consume an adequate level of water without having to sacrifice other essential needs.

A temporary subsidy may be implemented so as to give households time to adjust to the true cost of providing the service and to make the transition to the new higher tariff more politically acceptable. In the RIC's imminent Draft Determination for the Water and Wastewater Sectors 2009-2013 in Trinidad and Tobago, the implementation of a temporary subsidy, that could make the price increases more accepted by the public, was proposed. The existing gap between revenues and cost is so wide (currently revenue

covers only about 40% of average costs) that some form of transition support payment may be required. As the current tariffs are not fully cost-reflective and contain significant cross-subsidization in favour of domestic customers, any rebalancing and/or unwinding cross-subsidies is likely to significantly increase tariffs for lower income groups. If the tariff increase is inevitable, the GORTT may wish to protect the interests of the most vulnerable groups of the society and lower the impact of these changes through the introduction of transparent and targeted subsidies for lower income groups.

Poverty Eradication and Economic Development

In its report on "Making Water a Part of Economic Development", the Stockholm International Water Institute (SIWI)[10] presents a case that investing in water management and services is absolutely essential for the eradication of poverty and is a necessary condition for enabling sustained economic growth. Poor households who are not connected to the utility, waste time and labour to collect water and are not likely to participate in productive activities such as work and education that generate present and future income. The SIWI argues that better access to clean water, sanitation services and water management creates tremendous opportunity for the poor and is a progressive strategy for economic growth. Furthermore, it states that good management of water resources brings more certainty and efficiency in productivity across economic sectors and contributes to the health of the ecosystem.

[10] The World Health Organization and the Norwegian Agency for Development Corporation also contributed to the report.

"Pro-Poor" Regulatory Strategies

Given the high cost of water subsidies and their potential for creating significant damage to utilities and households, there is much interest in evaluating and improving utility subsidies. If it is recognized that water subsidy schemes have been performing poorly, in terms of serving the poor in Trinidad and Tobago, then it is clear that we need to determine what regulatory strategies are available to ensure that the poor are protected and in particular how to design subsidy schemes so as to ensure that they do serve the poor.

This section describes the various subsidy design options and instruments that the economic regulator can employ to ensure that the poor do benefit from water subsidies. It addresses the ways in which the existing regulatory framework can be adjusted so that it is "pro-poor". It is important that the regulator not work in isolation but consult with and seek guidance from policy makers (i.e. governmental agencies), service providers, customer groups and non governmental agencies (NGOs) when adopting "pro-poor" regulatory strategies.

Economic analysis suggests that direct subsidies are more efficient and effective than indirect subsidies in achieving the same (or better) results. Subsidies should be given directly to customers who deserve this financial support. Even though indirect subsidies present an inefficient manner to use limited resources, the choice to use these types of subsidy schemes lies in the hands of policy makers and is often motivated by political reasons.

Regulators must therefore develop targeted, directed subsidies, to customers who are truly in need, which are transparent, explicit and minimize any price distortions and other intended side effects of the subsidy, such as changes in the behaviour of water utilities and customers. However these types of subsidies often have high administrative costs attached to them and designing suitable eligibility criteria is difficult.

Furthermore, these subsidy schemes should have sunset provisions and be administered by an agency separate from the regulatory agency. In developing countries, in particular, it is difficult to terminate subsidy schemes, even when they have been shown to benefit the upper and middle classes rather than the poor, as interest and consumer groups often advocate their continuation. This can be avoided through the implementation of sunset provisions, which may also include a periodic review of the subsidy scheme in question.

If the subsidy scheme is administered by the regulatory agency, the regulator may only focus on providing subsidies on regulated services. This presents a problem if it is that a subsidy on the unregulated services proves to be more suitable for meeting the needs of the poor customers, for e.g., the provision of solar power for generating electricity is not regulated by the RIC in T&T but may be more suitable to meeting the electricity needs of the poor in rural areas, where connecting them to the network is not commercially viable for the service provider. The RIC is also proposing that "Abstraction of Water from Water Courses" be removed from among the regulated miscellaneous services in its imminent Draft Determination of the Water and Wastewater Sectors in Trinidad and Tobago, 2009-2013. However abstraction of water from springs may be more suitable to meeting the supply needs of the rural poor in Trinidad and Tobago.

Connection Subsidies

The subsidy schemes that have been in greatest use here in Trinidad and Tobago focus on lowering the volumetric charge for water rather than the connection/access charges. However the Willingness To Pay Survey that was conducted by the RIC in 2005, concluded that users were willing to pay for improvements in their water supply, once it was proven that WASA would indeed improve service levels and reliability of supply. Furthermore it showed that there was not full water coverage in Trinidad and Tobago, with lower income groups suffering from poor access more frequently than upper income groups. Poor rural households who are not connected to the water utility pay about 10 times more to purchase water from private sources than those who are connected to WASA's piped supply. It is often recognized that in Trinidad and Tobago, the charges

for new water connections are one of the main barriers[11] to poor households obtaining access to utility service. Studies show that in cases such as ours, subsidies to reduce the cost of new water connections will present a more efficient use of resources and a better means of reaching and targeting the poor than those used to lower the consumption charges to existing users. It is important when designing these connection subsidies that the particular group of customers who benefit from them actually deserve the subsidy.

Furthermore a case can also be made for the provision of subsidies for connection to centralized sewerage services. The Willingness to Pay Survey found that households have a low willingness to pay for access to wastewater services, as they deem their current sanitation facilities adequate for their needs. Although it is recognized that significant public health and environmental benefits can be gained through the treated disposal of residential wastewater, only 21.3% of the population is served by WASA's sewerage facilities. Therefore providing subsidies for connection to centralized sewerage systems may prove essential to mitigate against environmental threats from untreated wastewater. However to ensure cost recovery and the financial viability of the wastewater utility, increased environmental awareness is needed to increase the willingness to pay for the consumption of wastewater services.

Designing Eligibility Criteria

In designing the subsidy scheme, attention must be devoted to the proper design of eligibility criteria to identify those who will receive targeted subsidies. Foster et al (2000) propose that in order to determine whether a particular household should benefit from the subsidy, it is necessary to develop eligibility criteria that:

- Show a high degree of correlation with the underlying poverty variable of interest;
- Can be objectively measured and easily observed; and
- Are difficult to falsify or misrepresent.

[11] Connection charges are a barrier to access faced by the poor in Trinidad and Tobago, along with the high costs of extending the network and the costs of investing in the drainage, plumbing and sanitary installations needed to benefit from the connection.

The intended beneficiaries of water subsidies are those who are living under the poverty line, usually determined by a threshold for per-capita income or expenditure. However as it is often difficult to measure income levels directly, proxies are often used to select households such as household eligibility for other government assistance programs, geographical location, type of dwelling or amount of water used.

In the water sector, the amount of water that a household consumes is usually used as the means of identifying those households that should benefit from the subsidies. This mechanism is based on the assumption that poor households will generally be only able to afford to consume lower levels of water. The ability to measure and observe the amount of water used by a household is hampered by the fact that only 1% of domestic customers are metered in Trinidad and Tobago. If customers are metered it should be relatively hard to falsify meter readings. However, in Trinidad and Tobago, it is often the case that poor households use relatively large amounts of water as they tend to have larger families. Increasing block tariffs with lifeline tariffs, that are intended to provide the poor with a lifeline amount of water at this subsidized rate, in fact will benefit all households in T&T, regardless of income levels. A volume-differentiated tariff would be more useful to ensure that only those who use low levels of water will benefit from this lifeline tariff.

The Water Sanitation Programme 2002, in Paper 1 of its series on *Water Tariffs and Subsidies in South Asia: Understanding the Basics,* also suggests that there is the potential to use a self-selection process where the service provider provides two distinct levels of service. A low quality service is offered at a subsidized price and a high quality service at full cost. It is believed that only the truly poor who cannot afford the full cost service will opt for the subsidized service. One method traditionally used to provide this low cost service is to offer narrow diameter connection for poor households. However the capital costs of providing this form of connection is minimally different than the normal connection and poor households will now spend longer times to obtain water

from this narrow diameter connection. This self-selection mechanism may not be desirable in the local context as the RIC Act under Section 6 (3) (a to d) mandates the RIC to have regard to equal access by consumers to service and in respect of consumers similarly placed, to non-discrimination in relation to access, pricing and quality of service. Poor households may also fear embarrassment from choosing this lower cost service.

It may also be possible to select households based on certain characteristics such as income level, household eligibility for other government assistance programs, geographical location or type of dwelling. However there may be high administrative costs attached to using these characteristics to screen customers as they may be required to go through some application process. Using geographical criteria may prove to be the least time consuming and costly. Subsidies are allocated to all households living in zones that are considered to contain a relatively high concentration of poverty. This criteria is easy to measure and observe and relatively hard to falsify. However, it is only useful where there are well defined areas of poverty, such as the areas of Sangre Grande, Princes Town, Siparia, Mayaro/Rio Claro and Point Fortin in Trinidad and St. Paul in Tobago. However, care must be taken as geographical criteria may go out of date, e.g. Mayaro once had the highest prevalence of poverty in the country but has now been replaced by the region of Sangre Grande, although 26.6% of the population in Mayaro is still poor. Furthermore if this criteria is used those poor households who happen to reside outside of the selected zones will not benefit from the subsidy and those who do not meet the poverty criteria but happen to live in the selected zones will benefit from the subsidy even though they do not merit it.

It is possible to base the eligibility for the subsidy on an assessment of individual household circumstances. It would be difficult to obtain reliable estimates of household income and therefore proxies can be used to assess the poverty levels of individual households. Variables such as location of toilet facilities, level of education of the head of the household and connection to the telephone network can be used. However the level of correlation between these variables and poverty must be determined so as to

ensure that the criterion chosen is appropriate. Studies such as those done in Panama by Foster et al show that there will be a higher success rate in reaching the poor but the vast majority of subsidy funds would be allocated to households above the poverty line.

Determining the Size of the Subsidy

The regulatory agency should also be concerned with determining the amount of the subsidy. The value of the subsidy should be determined based on the affordability of current and future charges. Only the difference between the cost of purchasing a subsistence level of consumption/cost of the connection and the household's willingness to pay for the service should be covered by the subsidy. Given current tariffs, the Willingness to Pay Study conducted in 2005, shows that the water and sewerage tariffs are both affordable, except for those households who fall below the poverty level. A more detailed study will be needed to determine the exact magnitude of the subsidy needed for the poorest households, given current tariffs as well as if tariffs were to increase in the future. Furthermore, the size of the subsidy needed to induce poor households to connect to the water and sewerage network, will require the results from a more detailed study.

Subsidies with high targeting efficiencies will have high administrative costs attached to them. The selection process can absorb a significant volume of resources. As the costs of screening are not dependent on the size of the subsidy given to individual households, when the size of the subsidy is small, the administrative costs would absorb a significant portion of the subsidy payment. Therefore it can be argued that for small subsidies to households, the administrative costs are too high to justify the subsidy. Over time, the economic position of a household may have improved to a point where the subsidy is no longer necessary, so it is important to reassess the household's eligibility. However frequent reassessments lead to high administrative costs. One way to reduce high administrative costs for subsidy schemes is through the use of a harmonized system of eligibility criteria for these schemes. All the subsidy schemes will share the cost of the

socio-economic assessment that will be used to determine eligibility for the various schemes.

In determining the size of the subsidy one needs to ensure that there are no perverse incentives created from the subsidy scheme. If the size is based on affordability then the subsidy should never cover 100% of the costs of the service. Therefore the potential for wastage of water will be reduced and payment discipline encouraged. The subsidy can also be based on a pre-determined consumption threshold to avoid excessive consumption of the service. Finally the subsidy must be large enough and its duration long enough, before it is reassessed, so as to allow households time to benefit from the subsidy and improve their economic circumstances. This will help avoid poverty trap problems.

Funding of Subsidies

Traditionally, the cost of subsidies can be covered by utilities themselves, i.e. through decapitalization; through cross-subsidies, where "richer" customers pay tariffs that are above cost; or through the government budget, i.e. through general taxation.

If the utility covers the cost of the subsidies to the poor over a long period of time, it may find itself with a depleted working capital which leads to a weak financial position and eventually a deterioration of the quality of its services. An unreliable water supply, due to this shortage of working capital and lack of maintenance, causes governments and utilities to focus on providing water services to high priority users, such as government offices, health care providers, schools, industrial customers etc. These high priority areas are usually in the urban areas where the incidence of poverty is lower and where there is strong political pressure to maintain service levels and quality. Thus the poorest, unconnected and worst served households must now rely on more expensive, alternative water sources, due to a lack of increased service areas and service quality of the financially weak utility.

Cross-subsidies are often used where the "richer" customers pay higher tariffs so as to provide the "poorer customer" with lower tariffs, that are below costs. These subsidies often create distorted prices that send the wrong signals to consumers as to the amount of water that they should consume and lead to an inefficiently high demand for water by commercial and domestic customers. Furthermore, cross subsidies lead to distorted prices for industrial customers who may attempt to find alternative sources of supply so as to economize on their utility bills. Even if these customers cannot access alternative supplies they may cut back on their consumption leading to decreased revenues that will not cover the cost of the cross subsidy to the poor. Leaving a significant cross-subsidy in place could damage the competitiveness of some businesses. Industrial customers who are unable to find alternative supplies of water will face rising costs that hamper their competitiveness.

Cross-subsidies lead to serious problems for the utility if they are implemented over a long period of time. They put pressure on the system capacity and lead to shortages and deterioration of service quality as a result of inadequate new capacity and under-maintenance of existing capacity. Cross-subsidies also hamper any efforts at water conservation and environmental protection as domestic and commercial customers are not aware of the real cost of the water they consume and may in fact waste these scarce resources as they deem water a "free" good.

Although subsidies funded through the government have been the traditional approach here in Trinidad and Tobago, previous analysis has shown that government subsidies to fund the operating deficits of the utility will cause the tariff level to be lower for all customers rather than just the poor. These "supply-side" subsidies result in inefficiencies in the utility's operations as there is no urgency to control costs.

If it is believed that water subsidies ought to be provided by the government, then it is important that targeted subsidies are employed so as to lower the burden on the population. These "demand-side" subsidies will be given directly to individual customers who are eligible for financial support. The cost of tariff relief/subsidies should also be

recovered in a manner that does not create additional inefficiencies in the sector. For example, raising funds through a general tax system will impose lower costs on the society than creating a sector-specific tax system.

Determining Tariff Levels and Designing the Tariff Structure

Encouraging the utility to improve its efficiency and facilitating this by allowing it to charge full cost tariffs (and removing the subsidy provided by government) will be of greater benefit to the poor than charging them the "lowest possible price". The regulator should therefore formulate recommendations on bringing tariffs to cost-recovery levels, even if he does not have the power to impose these tariff changes.

Increasing block tariffs are often recommended as it is felt that the low cost lifeline tariff will mostly benefit the poor. This is based on the assumption that the poor can only afford to consume small amounts of water. However, in Trinidad and Tobago, it is often the case that poor households use relatively large amounts of water as they tend to have larger families. Increasing block tariffs with lifeline rates, that are intended to provide the poor with a lifeline amount of water at this subsidized rate, in fact will benefit all households in T&T, regardless of income levels[12]. Exclusion risk can also arise where the tariff does not benefit the poor as they are not connected to the utility. Furthermore this tariff structure only benefits the poor if they are metered and in fact use a small amount of water.

A volume-differentiated tariff would be more useful to ensure that only those who use low levels of water will benefit from this lifeline tariff. Here the price that the consumer pays increases as the quantity of water used increases and consumers are charged the unit price for the last block of their consumption. Only those who limit their consumption to the lower blocks would get a subsidy. However, exclusion risk can arise where the tariff does not benefit the poor as they are not connected to the utility. Furthermore this tariff structure only benefits the poor if they are metered and in fact use a small amount of

[12] This is known as the error of inclusion as all households benefit, regardless of income.

water. The error of inclusion may also arise if the first (lifeline) block is very large, as a large number of "rich" customers now also benefit from the subsidy.

Evaluation of the Performance of Water Subsidy Schemes in Trinidad and Tobago

Although it is recognized that subsidies may be essential in making water and sewerage services affordable for the poor, extensive research has shown that the poor rarely in fact benefit from broadly based subsidy schemes, which often continue long after they are useful. Subsidies given to WASA have benefited the middle class and rich, rather than the poor, who often receive their water from sources other than the monopoly water utility, as in Trinidad and Tobago, access rates for poor, rural households have remained low.

Poor households in T&T often receive the lowest levels of supply, if any, and therefore must resort to spending large sums of money on various expensive and/or unsafe coping mechanisms to supplement deficiencies in water supply and pressure. The cost of intermittent water supply for households is high with the average capital cost for installing a pump and tank currently estimated at $5,300 per household. Most of these consumers pay a substantially higher price than if the service provided by WASA were universal and reliable.

It is important that policy makers step back and re-evaluate subsidy schemes on a regular basis to ensure that these schemes remain useful to the poor. In many cases the needs of the poor may change and it is often the non-poor customers that benefit from the subsidy. The effectiveness of a subsidy is best determined by the extent to which it reaches the poor and the amount of purchasing power that it transfers to them (Lovei et al, 2000).

Lovei et al (2000) suggests using seven criteria to evaluate the performance of subsidy mechanisms. These were employed in their assessment of subsidy mechanisms in Central and Eastern Europe and the Former Soviet Union. This paper utilizes these criteria (as presented below, items 2 through 6) to examine water subsidies in Trinidad and Tobago. The first criterion presented below, assessing the genuine need for the

subsidy, is not explicitly stated by Lovei et al but its use is vital in determining the performance of subsidy schemes. The criteria that will be used are as follows:

1. The ***genuine need*** for the subsidy.
   It is important to determine if a subsidy for water and sewerage services is really needed for certain groups of customers. Measures such as determining if an excessive percentage of household income is spent on water or examining what people are able and willing to pay can be used to access this need.

2. The ***coverage*** of the subsidy, i.e. the extent to which the poor are being reached.
   It is important to ensure that the subsidy is indeed reaching the poor, for whom it was designed and that a large proportion of the poor benefit from the subsidy.

3. The ***targeting*** efficiency of the subsidy, i.e. share of the subsidy that goes to the poor.
   A targeting variable is often used to identify households that are eligible to benefit from a particular subsidy. It is important that these variables are well chosen to ensure that funds are not wasted on households who meet the criteria but are not genuinely in need of the subsidy.

4. The ***predictability of the benefit*** for the poor.
   The poor should be able to predict with a high degree of certainty that they will receive the subsidy, so that they can effectively plan their spending activities.

5. The ***extent of price distortions and other unintended side effects*** of the subsidy.
   Subsidy mechanisms can leads to changes in the relationship between cost and prices and distortions in demand. It is important to monitor these and if necessary find ways to remove these distortions so that economic efficiency is achieved.

6. ***Administrative cost and simplicity.***
   High administrative costs are often associated with schemes that have high targeting efficiencies. Although screening customers to determine eligibility is important, it is

also equally important that there be a balance between the targeting efficiency and administrative costs. It is important that the costs imposed by the administration of the subsidy do not place an excessive burden on those funding it.

Targeted interventions on poverty date back to the period when the GORTT was forced to undertake a formal structural adjustment programme under the indirect supervision of the IMF and the World Bank. In addressing poverty in T&T, the GORTT introduced various water subsidy schemes. This paper examines how well the following subsidy schemes in Trinidad and Tobago perform in meeting their objectives:

1. **General Subsidies** in the form of:
   - *Operating Subsidies,* where the operating deficits of WASA, partially due to low tariffs, are funded by government subventions.

   and
   - *Capital Subsidies* in the form of:
     - National Social Development Programme, which is focused on providing and improving the supply of water to low income communities

2. **Cross-subsidies,** whereby the industrial customers cross-subsidise commercial and domestic water customers

3. **Direct Subsidies**
   - *Hardship Relief Programme,* which provides price discount to recipients of Senior Citizen Grant, Public and Disability Assistance.

This evaluation will comprise a brief description of each scheme, a discussion on the performance of the scheme based on the selected criteria and some final remarks.

General Subsidies

Operating Subsidies

The operating deficits recorded annually by the water utility in Trinidad and Tobago are being subsidized by the State. These operating deficits are partially brought about by artificially low tariffs, that do not recover the costs of supplying the water, as well as poor collection efficiencies on the part of the utility. Tariffs are usually kept low as policy makers often believe that increasing tariffs will harm the poor and politicians wish to buy the support of the public. Commercial and domestic customers therefore benefit from artificially low tariffs that are provided by these subsidies.

In examining these subsidies it is important to determine if the water and sewerage tariffs are currently unaffordable and if there is a ***genuine need*** for an operating subsidy. Two measures are typically used to measure the affordability of tariffs. The first looks at calculating the proportion of income that poor households actually spend on water and sewerage services. This percentage is compared against the international benchmark that suggests that water bills that are no more than 5 percent of income are generally considered affordable for the poorest households. Given a poverty line, as estimated in the SLC 2005, of a household monthly income of TT$665. and given a current monthly water bill of TT$36. for low income households, a household on the poverty line would on average be assigning just more than 5 percent of its income on water charges. Given a current monthly bill of TT$25. for sewerage charges, the poorest households would spend just under 4 percent of its income on sewerage charges.

A customer's willingness to pay can be used as a proxy of the affordability of the service. Willingness to pay indicates the maximum price at which a household would still be willing to use the service, and, as such, it provides a measure of affordability. A Willingness To Pay (WTP) study will determine the amount that each household is willing to pay for a certain level of service, which is dependent on the household's preferences as well as the quality of the existing alternative arrangements, for e.g. water from rainwater, wells, and rivers. The results from the willingness to pay study are then

compared to cost recovery prices to determine if the tariff is affordable for different households. The results of the WTP survey conducted by the RIC in 2005 are presented in Tables 7 and 8. Using both the Contingent Valuation Method and the Choice Model, piped and standpipe users are both willing to pay more than the current tariff for water. Similar results are shown for wastewater services, where the mean WTP is higher than the current tariff for the central sewerage system.

Table 7: Mean WTP predicted by Contingent Valuation Method and Choice Models

	Mean WTP- Contingent Valuation Method (per month)	**Mean WTP- Choice Model (per month)**
Piped Users	$48.00	$153.67
Standpipe Users	$62.00	$191.67

Source: RIC. March 2005. Customers Willingness to Pay for Changes in Water, Wastewater and Electricity Services in Trinidad and Tobago- A Survey.

Table 8: Mean WTP for Wastewater Service Upgrades

	Mean WTP (per month)
Central Sewerage System	$28.61
Septic Tank	$27.11
Latrine	$27.37

Source: RIC. March 2005. *Customers Willingness to Pay for Changes in Water, Wastewater and Electricity Services in Trinidad and Tobago- A Survey.*

Therefore it can be said that water and sewerage bills in Trinidad and Tobago, at the current tariff level, are just affordable to the average household above the poverty line. Any genuine problems of affordability of water and sewerage services will be seen in those households below the poverty line and it is only these households that should be considered for consumption subsidies for water and sewerage services. Furthermore, only those households below the poverty line who spend more than TT$33.25 per month on their water bills, i.e. more than the international benchmark for affordability, should be considered for a consumption subsidy and the size of the subsidy should only be as large as is necessary to ensure that the household does not spend more than TT$33.25 per month on their water bill.

The ***coverage*** ratio of this subsidy is equal to the share of connected households among the poor. Given information from the SLC 2005, it can be seen that 71.2 percent of the poorest households in Trinidad and Tobago have access to a water supply, as determined by WASA's definition of water coverage.

The ***targeting*** ratio of operating subsidies can be determined by the share of the poor among those that are connected and benefit from the operating subsidy. As all households benefit from operating subsidies this scheme perform poorly in terms of targeting the poor. The poorest households represent only about 9% of those who are connected and benefit from this operating subsidy, through artificially low tariffs. Of the TT$ 1,290.29 million spent on average on these subsidies yearly, only about TT$ 109.84 million benefit the poorest households in T&T.

The ***predictability*** of the benefit received through operating subsidies is high for poor households. Even though government subventions are often not timely or sufficient, poor households can be assured that they will continue to benefit from low tariffs, at least in the short run and as long as government's revenues remain buoyant, as the GORTT wishes to maintain political support from the electorate.

However operating subsidies often create ***distorted prices*** that send the wrong signals to consumers as to the amount of water that they should consume and lead to an inefficiently high demand for water by customers that benefit from these subsidies. This can put pressure on the system capacity and lead to shortages and a deterioration of service quality as a result of inadequate new capacity and under-maintenance of existing capacity. Furthermore the utility has no incentive to improve its efficiency as any losses would be covered by the operating subsidy. Operating subsidies can also hamper any efforts at water conservation and environmental protection as customers are not aware of the real cost of the water they consume and may in fact waste these scarce resources as they deem water a "free" good. Thus it can be seen that there many unfavourable consequences of operating subsidies for both the utility and the country as a whole.

Operating subsidies are ***easy to administer*** but can place a ***heavy burden on the government budget, utilities and poor customers***. From 2005 to 2008, government subventions to WASA have averaged TT $1,290.29 million per year. To maintain the financial viability of the service provider it is vital that the subsidy be sufficient and on time. However this is often not the case in T&T and this has significantly harmed the utility as it has been unable to invest and increase service areas and quality of service. Poor households end up losing as the utility is unable to expand its services to non served customers. The subsidy that is provided by the state thus only benefits those who have access to piped water supply.

Encouraging the utility to improve its efficiency and facilitating this by allowing it to charge full cost tariffs (and removing the operating subsidy provided by government) will be of greater benefit to the poor than charging them the "lowest possible price". The regulator should therefore formulate recommendations on bringing tariffs to cost-recovering levels, even if he does not have the power to impose these tariff changes.

Capital Subsidies

National Social Development Programme (NSDP)

The National Social Development Programme (NSDP) is designed to meet the needs of low-income communities throughout the country by providing and improving the supply of water and electricity to communities, residences, recreational, sporting and other facilities. The request for water supply must fall into one of the following 2 categories: an area with a water supply less than 72 hours per week, or no water supply. Special consideration will be given to areas where there are low-income families[13]. NSDP[14] supplies connection to **water mains**[15] but not water connection to private property. The household must still pay the connection charge due to WASA for connection to its property[16].

To be eligible for the programme, individuals, community leaders and Community Based Organizations (CBOs) must be prepared to show evidence that the individual or community is unable to afford the service and the individual must have proof of legal right to the property to which the service will be provided, such as a rent or lease agreement, land title, Deed of Comfort, letter from the owner granting permission for the installation or affidavit indemnifying WASA from litigation wherever ownership of the property is challenged.

The programme is administered by the Ministry of Public Utilities. Once the application is submitted, it will be assessed and a site visit will be conducted by an NSDP officer to ascertain the validity of the request. If the application is approved, the applicant will be

[13] Water services under this facility will <u>not</u> be provided to commercial enterprise, private land developments and private housing developments.

[14] The programme includes: Pipe laying; Installation of Booster Pumps; Drilling of Wells; Installation of Communal Water Tanks; Installation of Strategic Water Storage Tanks; and Supply of Truck borne water to areas adversely affected by dry season conditions

[15] The NSDP programme pays for the cost of laying a section of new water main if it is not present nearby and connecting it to the existing network; upgrading the existing local network to accommodate the new connection (e.g. installation of booster pumps etc.) ; and developing new resources to accommodate new connection (e.g. drilling of wells etc.).

[16] This is the cost of laying a service pipe to a property and making the connection to the existing water main.

contacted by a representative from the Ministry and arrangements will be made to install the service. The timeframe within which the service will be provided depends on the type of service being requested and the complexity involved in having it installed.

Although the vast majority of poor households in Trinidad and Tobago are able to afford to use water and sanitation services, the costs of a connection to the water and sewerage network may be high relative to what they can afford. Poor households face connection charges as well as the costs of investing in the drainage, plumbing and sanitary installations needed to benefit from the connection. To obtain a water connection, the applicant must pay a TT$200. non-refundable application fee. After the feasibility of the connection is determined, to obtain the connection a further cost must be paid. This is based on the location to the nearest main and ranges from TT$687.50 to TT$737.50 Therefore a subsidy for connection may be ***necessary*** as the poorest customers, who earn less than TT$665. per month, are unable to afford the high costs of extending the water network in addition to the connection charge.

It is important to note that the applicant must own their house and land and thus may not be "absolutely" poor as they are property owners. In fact they may be "relatively" poor or the household may be a very poor one. Furthermore to qualify for the NSDP the community must be formalized which eliminates the eligibility of any squatter communities. This problem is further compounded by the fact that in Trinidad and Tobago, no new applications for squatter regularization are being accepted. To be eligible for the squatter regularization programme[17] one must (a) have submitted an application form prior to October 27th, 2000; (b) have been squatting on State land before January 1st 1998 and (c) be in occupation of a single dwelling unit situated on a plot of State Land no less than 3,500sq.ft and no more than 5,000sq.ft. Squatters who have received a Letter of Comfort are only protected from ejectment from State Land but do not have any legal right to the property, which is only obtained through the acquisition

[17] The squatter regularization programme seeks to improve the living conditions of eligible squatters by upgrading or establishing physical infrastructure such as roads and drainage, along with the provision of services such as potable water and electricity.

of leasehold titles by squatters and tenants[18]. Although issues related to the affordability of water connections are important, it is clear that securing land tenure for the poor is more urgent and is a necessary prerequisite to increasing access by the poor.

The charge for sewerage connections is not predetermined by the utility or regulator but is based on the actual costs of providing the connection. As only 21.3% of the population is served by WASA's sewerage facilities, a subsidy for connection to centralized sewerage systems may prove ***essential*** to mitigate against public health and environmental threats from untreated wastewater.

The ***coverage*** ratio for this programme is significantly high. Subsidies for capital programmes reach the largest number of poor households in T&T. Over the last 5 years, more than 200,000 poor persons, i.e. 92 percent of the poor in Trinidad and Tobago, have benefited from NSDP projects that have provided and improved the supply of water.

The ***targeting*** ratio of the National Social Development Programme can be determined by the incidence of poverty within the groups that qualify for the programme. NSDP performs better than operating and cross subsidy schemes in terms of targeting the poor as to be eligible, evidence must be provided to show that the individual is unable to afford the service. However not all beneficiaries of NSDP fall below the poverty line in T&T. Of the TT$97.47 million spent on average on the programme yearly, about TT$68.94 million (71%) benefits the poorest households.

As funds for the NSDP are set aside yearly in the government budget, consumers can have ***some certainty*** that they will benefit from these subsidies. However many of the budgetary allocations that will provide the funds for WASA's Capex are not firm commitments and are not certain to materialize; the release of the funds is generally a complicated process; and the level of funding and the timing of releases have never been adequate.

[18] For further information, see the State Land (Regularization of Tenure) Act, 1998, Trinidad and Tobago.

Debomy et al (2005) identify a number of ***perverse incentives*** that can arise from subsidizing connections. Firstly, free water connections provide houses with piped water that is highly sought by the users, but the nature of the good, the technology of its supply and the method of paying for it all put consumers at risk of using more than they can pay for. However in Trinidad and Tobago, only 1% of domestic customers are metered and therefore customers do not pay tariffs based on the amount of water that they use. When metering of all households is in place it is important that customers can carefully monitor their water use through these meters, so that they only consume what they can afford. As water bills are issued every three months, this may pose serious cash flow problems for poor households. The RIC has recognized this and has proposed in its imminent Draft Determination of the Water and Wastewater Sectors in Trinidad and Tobago, 2009-2013, that customers be billed on a bi-monthly basis.

Secondly, subsidizing water connections promotes the consumption of water and increases the production of wastewater. These negative spillovers from wastewater may outweigh the positive effects of subsidizing water connections. Measures must therefore be put in place to increase facilities for the treatment of wastewater, to facilitate increased access to these services and the related affordability of these services by the poor. Lastly Debomy identifies subsidies for connection as "worthy goods" that are not provided over time. "Worthy goods" are typically provided over a period of time, on the condition that the recipients maintain their eligibility to receive them. However subsidies for water connections are provided at one point in time, without regard to the continued eligibility of the recipient.

The ***cost of administering*** NSDP water projects is relatively low. From 2005-2008, government has spent on average TT$97.47 million per year on this programme.

Cross-Subsidies

In Trinidad and Tobago, domestic customers have traditionally enjoyed a substantial cross subsidy in the water tariff. The actual revenue (2002-2006) collected from

domestic, commercial and industrial customers when compared to the revenue that would have been collected from these customers had it been proportional to the volume of water consumed by each of these classes shows that in the case of domestic customers, on average, actual revenue is about 57% of what it would have been if the revenue reflected the volume of water consumed. For Commercial and Industrial Customers the percentages are 86% and 307% respectively. Both domestic and commercial customers continue to pay a tariff that is less than the cost of supplying them with the water that they use, with the industrial sector cross-subsidizing them[19].

The ***coverage*** ratio of this subsidy is equal to the share of connected households among the poor. Given information from the SLC 2005, it can be seen that 71.2 percent of the poorest households in Trinidad and Tobago have access to a water supply, as determined by WASA's definition of water coverage.

The ***targeting*** ratio of operating subsidies can be determined by the share of the poor among those that are connected and benefit from the operating subsidy. As all households benefit from cross subsidies this scheme perform poorly in terms of targeting the poor. The poorest households represent only about 9% of those who are connected and benefit from this operating subsidy, through artificially low tariffs. Of the TT$147.million spent on average on this subsidy yearly, only about T$12.51 million benefits the poorest households.

The ***predictability*** of the benefit received through cross subsidies is high for the poor. There is a high probability that poor households will receive benefits from cross subsidies. Even though government subventions are often not timely or sufficient, poor households can be assured that they will continue to benefit from low tariffs, at least in the short run and as long as government's revenues remain buoyant, as the GORTT wishes to maintain political support from the electorate.

[19] In fact, studies have shown due to economy of scale effects and the relative stability of industrial demand within a day and within a year, the cost of providing water to industrial consumers is significantly below the cost of supply to households.

However it is recognized throughout the literature as well as in practice that there are many unfavourable consequences of cross-subsidization, for both the utility and the country as a whole. These subsidies often create ***distorted prices*** that send the wrong signals to consumers as to the amount of water that they should consume and lead to an inefficiently high demand for water by commercial and domestic customers. Furthermore, cross subsidies lead to distorted prices for industrial customers who may attempt to find alternative supply sources so as to economize on their utility bills. Even if these customers cannot access alternative supplies they may cut back on their consumption leading to decreased revenue for the utility from industrial customers. Leaving a significant cross-subsidy in place could damage the competitiveness of some businesses. Industrial customers who are unable to find alternative supplies of water[20] will face rising costs that hamper their competitiveness. Cross subsidies also place a ***heavy burden*** on the industrial customers who pay above the economic cost of supply, cross-subsidizing other customers to the tune of $147 million in 2006.

Cross-subsidies lead to serious problems for the utility if they are implemented over a long period of time. They put pressure on the system capacity and lead to shortages and deterioration of service quality as a result of inadequate new capacity and under-maintenance of existing capacity. Cross-subsidies also hamper any efforts at water conservation and environmental protection as domestic and commercial customers are not aware of the real cost of the water they consume and may in fact waste these scarce resources as they deem water a "free" good.

As regulation is concerned with ensuring that utilities operate efficiently so that they earn sufficient return to finance necessary investment, the economic regulator of water services must be concerned with reducing or eliminating cross-subsidies. In fact the practice of using the industrial sector to cross-subsidize other sectors is not in keeping with the requirements of the RIC Act. Economic efficiency should be at the core of setting water tariffs.

[20] Alternative supplies of water are often more expensive or their access may be forbidden.

The regulator can employ a number of options to reduce/eliminate cross subsidies. "Phasing-in" of cost-reflective tariffs increases over a short period of time will allow for the removal of cross-subsidies and soften the impact of large tariff increases. However in the long run they result in higher rates and lead to intergenerational equity issues. Additionally, those who are currently paying more than their fair share will continue to pay (at least) a little more in the interim. Price rebalancing can also lead to the reduction of cross-subsidies. This process promotes allocative efficiency as tariffs are aligned closer to the economic costs of providing the service. However, those benefiting from particularly low initial rates can be very poor and/or politically powerful and are likely to resist such price alignments. Cross-subsidies can also be replaced by targeted subsidies to low income groups in the form of life line rates or direct subsidies so as to decrease the burden of the new higher tariffs for the poor.

Direct Subsidies

Hardship Relief Programme

To qualify for this subsidy, persons must be a recipient of Old Age Pension (Senior Citizens' Grant), Disability or Public Assistance Grant, and must have a water bill with one of the following classifications:

- A_2 – No internal water supply (yard tap only).
- A_3 - Internal water supply available.
- A_4. - Internal water supply along with the presence of a water meter.

The applicant must own the property for which the water bill is issued. The WASA accounts of newly approved applicants[21] are credited by the end of the month following the close of the quarter[22] in which the application was submitted. A credit of TT$100.00

[21] To apply for this programme, persons must obtain and complete an application form from the Ministry of Public Utilities or from any Water and Sewerage Authority (WASA) office. Applications are processed in batches and eligibility is determined by the second week of each month, after which applicants will be notified as to whether their application was approved.

[22] Quarters run from January to March, April to June, July to September and October to December. Therefore, it can take between one and four months to receive a credit, depending on how early or late in the quarter the application was submitted.

is made annually to the water bill of all accounts classified as A3 and A4. Accounts classified as A2 receive an annual credit of TT$70.00. These credits are usually made by November of each year. If the participant is deceased or is no longer in receipt of Public Assistance or the Disability Grant, payments will be discontinued.

The ***coverage*** is determined by the proportion of the poor of who receive benefits from the Hardship Relief Programme. HRP has the lowest coverage ratio of the subsidy schemes discussed in this paper. Of the approximately 39,546 poor households in T&T, 8,628 are recipients[23] of the HRP.

The ***targeting*** ratio[24] of the Hardship Relief Programme can be determined by the incidence of poverty within the groups that qualify for the price discount. The Hardship Relief Programme has the best targeting efficiency of the subsidy schemes discussed, as to be eligible for this programme, one must be also be a recipient of other government programmes for which one's eligibility is determined by having a low income level. Of the TT $840,000 spent on average on the HRP yearly, about 80 percent or TT$ 670,000 of this goes to the poorest households.

This mechanism provides ***fairly high predictable*** benefits to the poor. As funds for the HRP are set aside yearly in the government budget, consumers can have some certainty that they will benefit from these subsidies. However many of the budgetary allocations that will provide the funds for WASA's Capex are not firm commitments and are not certain to materialize; the release of the funds is generally a complicated process; and the level of funding and the timing of releases have never been adequate.

The ***distortionary*** effects of this subsidy are not severe as the price discount is not 100% and therefore does not lead to highly wasteful consumption patterns or payment indiscipline by those who qualify.

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[23] As at September 9th, 2009 there are 10,786 recipients of the HRP

[24] The targeting efficiency of this programme can also depend on the size of the price discount provided to those who are eligible; their utility connection ratios and the volume of water consumption of those eligible persons that are connected.

Administering this subsidy involves determining the eligibility of the customer; noting the privileged status of those customers who qualify and the applicable price discount on each customer's record kept by the utility; and taking the discount into account when issuing the bill for these customers. In comparison to the operating and cross-subsidies, there are clearly higher administration costs associated with the Hardship Relief Programme. However due to the size of the price discount and the number of customers that qualify, the burden on the government budget is minimal. From 2005 to 2008, government funding for the programme has averaged TT $0.84 million per year.

Performance of Water Subsidies in Trinidad and Tobago

It is clear from the previous analysis that water subsidy schemes have been performing poorly, in terms of serving the poor in Trinidad and Tobago. The results of the evaluation of the performance of subsidy schemes in Trinidad and Tobago are summarized in Table 9 below.

Table 9: Evaluation of Subsidy Mechanisms in Trinidad and Tobago

	Operating Subsidies	**NSDP**	**Cross-Subsidy**	**HRP**
Genuine Need	Poorest HH	Poorest HH	Poorest HH	Poorest HH
Coverage	71 %	92 %	71 %	22 %
Targeting	9 %	71 %	9 %	80 %
Predictability	High	Fairly High	High	Fairly High
Pricing Distortions	High	Low	High	Low
Costs to Customers, WASA & GORTT	TT $ 1,290.29 million per year	TT $ 97.47 million per year	TT $ 147.00 million per year	TT $ 0.84 million per year

In Trinidad and Tobago, only the poorest households have a genuine need for consumption and connection subsidies. However many poor households are excluded from subsidy programs altogether because they are not connected to the network. Water subsidies benefit all, rather than just the poor. Table 10 shows that of a total TT$ 1,535.6 million allocated to water subsidies yearly, only TT$191.96 million benefits the poorest households. It is clear that wealthier households are more likely to have access; pay less for water service; and consume higher volumes of safer water.

Table 10: Average Yearly Government Funding of Water Subsidies in Trinidad and Tobago, 2005-2008 (TT$Mn.)

	Operating Subsidies	**Cross-Subsidy**	**NSDP**	**HRP**	**TOTAL**
Total	1,290.29	147.00	97.47	0.84	1,535.6
Poorest Households	109.84	12.51	68.94	0.67	191.96

From the above evaluation of the various subsidy schemes in Trinidad and Tobago it can be seen that these subsidies can actually hamper improvements in the quality of service to existing customers and improved access by unconnected households. As in the case of WASA, government subventions are not always reliable or adequate, cross subsidies do not cover the overall subsidies provided to customers and inefficiencies persist as the utility is not motivated to reduce high costs. This has resulted in an inefficient, financially weak utility that has been unable to improve service quality and increase service areas.

Operating and cross subsidies engender distortions in the use of water, thereby leading to an inefficient use of resources and thus indirectly raising the costs of service provision. Subsidies can also induce inefficiency in utility operations, as utility managers face soft budget constraints. The costs of subsidies in terms of inefficiency may rival or exceed

any benefit derived from the provision of the subsidy. The poorest unconnected households face the prospect of relying on alternative and often more expensive water sources for many years to come, due to the financial weakness of WASA. Funding of subsidies has placed a heavy, excessive burden on customers, WASA & the GORTT. Given the high cost of water subsidies and their potential for creating significant damage to utilities and households, there is much interest in evaluating and improving utility subsidies.

The majority of the water subsidies in Trinidad and Tobago are not well targeted to the poorest households. Access to the network is lower for this group; non-poor households consume more than poor households; a connection subsidy is non-existent, as all households pay the same amount; and the ratio of subsidies going to the poorest households vs. the non-poor households is only 1 : 8. Only the Hardship Relief Programme is fairly well targeted. The performance of the other subsidies can be improved through proper targeting mechanisms, e.g. means testing. The current consumption subsidies are not good redistribution tools, as access is biased against the poor. Therefore the emphasis should be on connection subsidies, as potential benefits will outweigh costs[25]. Government transfers are wasted and absorbed by inefficiencies.

The RIC's "Pro-Poor" Strategies

In reviewing the tariffs in the water and wastewater Sectors in Trinidad and Tobago, the RIC has proposed a number of mechanisms for assisting those who can least afford to pay, including:

- the adjustment to what would be the desired level of rates to be implemented over the five year period of the tariff review;

[25] Poor rural households who are not connected to the water utility pay about $1,896. yearly to consume $8m^3$ bi-monthly compared to a cost of $189.6 yearly to consume the same amount if they were connected to WASA's piped supply. Connecting to the utility will result in a yearly savings of $1,706.40

- subsidies between customer groups to be withdrawn gradually over time.
  There will be a significant reduction in the amount of the subsidy provided to residential customers by industrial customers to bring the rates closer to the cost of supply to all classes;

- objective of affordability is still a key factor in setting charges for households.
  Rates to be structured to provide a subsidy for all residential customers but, in particular, to lower income groups; the main rationale being that water ought to be made available to every citizen in a modern society because of its potential impact on the standard of living and quality of life in general;

- putting water at the centre of poverty-reduction strategies with predictable funding. The RIC will require WASA to include pro-poor criteria in undertaking investments in water supply projects. The RIC wishes to include water supply projects for the worse served areas in establishing the revenue requirement for the service provider, thereby making funds available for the undertaking of these projects. The RIC will monitor the implementation of these projects on a continuous basis;

- the establishment of a lifeline block ("social block") in the tariff structure for consumption-related tariff. This block will reflect basic needs to ensure an acceptable quality of life with respect to hygiene and basic household needs;

- setting clear goals and holding the service provider accountable. The RIC would like to set a goal of at least 2 days per week water supply to everyone in the country, with lack of performance being penalized through incentive mechanism;

- establishing a rebate system for areas receiving 2 days or less per week water supply;

- extended payment arrangements, whereby the customers will be able to negotiate reasonable payment arrangements (installment payment plans), waiving of interest

payments on outstanding accounts for customers demonstrating severe financial hardships, and access to financial counseling;

- eliminating standpipe charges and requiring WASA to connect standpipe customers to its network within five years. Standpipe customers would benefit from the proposed new arrangements, as local authorities are encouraged to pay for standpipe supply until they are connected to WASA network; and

- the establishment of a special low income assistance programme whereby a separate fund is being established by the service provider to cater for the special needs of the poorest and most vulnerable consumers in the society.

Concluding Remarks

Where the poor remain unconnected to the water and sewerage utility, where the level of poor supply is high and where water quality is poor, it is clear that these affected persons do not benefit from any subsidies provided to the citizens of Trinidad and Tobago and in fact actually pay more for water than if the supply from WASA was universal and reliable. Therefore, targeted, direct, consumption and connection subsidies to the poorest households should be provided by the government.

If subsidies are to address affordability concerns, they must be better designed and targeted. The Hardship Relief Programme is the only subsidy that is really needed and in fact this programme should be expanded. The emphasis should be providing other interventions, rather than subsidizing WASA. Increasing access rates by providing connection subsidies, if necessary and providing subsidies to low-income households who are not connected to the public network should all be considered, as the provision of access has the potential to improve welfare considerably.

It is clear that water tariffs are not a good redistribution tool and therefore redistribution should not be the aim of providing low water tariffs. The willingness to pay for improved service is high and therefore low tariffs for water do not adequately reflect the ability of households to pay for improved service, thus imposing an unnecessary burden on financially weak WASA.

The financing of WASA must be separated from providing subsidies, as transfers to WASA mix two different financial issues, i.e. utility financing needs and social equity considerations. In fact this practice has destroyed the payment culture of customers, management initiative and any incentives for efficiency. This has undermined the viability of WASA and has resulted in a declining quality of service provided by WASA.

There are many advantages of unbundling these two financial objectives. Firstly, sustainable tariffs are the best guarantee for sustainability of services in the medium to long term. This unbundling will make subsidies more transparent and finally this framework will provide better incentives for the service provider.

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