1. INTRODUCTION

The Inter-American Development Bank has estimated that for Latin America and the Caribbean, Investments in water and sewerage services need to reach more than $150 billion in the next 12 years to achieve the goals set for the sector in the region. The same IDB report also indicated a fall in investments in these sectors in most countries and pointed to the need for: 'a sharp increase in the volume of investment in the coming years', to enable Latin America and the Caribbean to achieve the coverage required by the Millennium Development Goals.

The vast majority of the population of the Caribbean currently has access to potable water, with most countries reporting access levels well above 90%. But, there are persistent problems in providing this service in an efficient and affordable manner to those currently being served. The efficiency and effectiveness of Caribbean water utilities could be enhanced by investments to:

(a) meet the demands of new and expanding economic activities and a burgeoning urban population through system expansion (treatment plants, storage tanks and transmission and distribution mains);

(b) reduce high energy costs by improving the performance of pumping systems;

(c) reduce unaccounted-for-water; and

(d) improve system serviceability through the upgrading of system hardware such as macro and micro meters, pressure reducing/sustaining valves and supervisory control and data acquisition (SCADA) systems.

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1 The countries of: Anguilla, Antigua, Bahamas, Barbados, Belize, BVI, Cayman Islands, Dominica,Granada, Guyana, Monsterrat, Nevis, St. Kitts, St. Lucia, St. Vincent, Turks and Caicos Islands
The situation with respect to sewerage is alarming with less than 20% of the wastewater produced collected and less than 5% adequately treated and disposed of. Clearly there needs to be a rapid expansion in sewerage services throughout the entire Caribbean. Urgent action is needed in:

(a) providing functioning sewerage systems for the most densely populated areas and, in particular, the capital cities; and

(b) the construction of central sewerage systems to replace the 'temporary' packaged sewage treatment plants that have mushroomed particularly, in coastal zone areas serving the region's vital tourism industry.

It is known that Caribbean Utilities must invest more than they have been investing in the past to deal with the deficiencies highlighted above. However, data on past capital investment levels are not available as are estimates of current investment needs. Such needs could be well above US$600 mn for the first ten-year investment period.

2. SOURCES OF CAPITAL

The financing of projects for water supply and sewerage services has never been popular with financial institutions, which are wary of the issues involved in providing capital to a sector characterised by:

(a) high up-front capital outlay;

(b) high degree of asset specificity negating the possibility of asset liquidation as a means of funds recovery;

(c) high foreign input in the provision of the operational assets; and

(d) repayment of debt in foreign currency and stretching years into the future from a risky revenue stream in local currency.

Caribbean Utilities have traditionally accessed funds to finance capital expenditure from:

a. internally generated funds;

b. government financing;

c. bilateral funding grants and concessionary loans, Canadian Development Agency (CIDA), DIFID, various funding agencies of the French Government; and

d. multilateral financial institutions, for example, CDB, World Bank and IDB.
Clearly if there is to be a quantum leap in the funding of water supply and sewerage projects, other sources of financing must be tapped, such as:

(a) Commercial banks;
(b) Direct equity investment (foreign and/or local); and
(c) Capital markets [fixed income investments (bonds) and equity investments (securities)].

2.1 Cost of Capital

Irrespective of the source, **capital is never free**. There is always a cost attached to funds used for investments. This cost is referred to as the 'cost of capital'. The 'cost of capital' has two dimensions. The first is the cost of equity capital and the second the cost of debt capital. For any particular project, the overall 'cost of capital' is assessed from the weighted average of its components, or as is normally stated, the Weighted Average Cost of Capital (WACC). WACC is calculated from the formula:

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\text{WACC} = \text{Weighted Average Cost of Equity} + \text{Weighted Average Cost of Debt}
\]

The cost of each portion of WACC is 'weighed' by its proportion of the total capital. So that for a leverage ratio (debt/equity) of 80 to 20, the cost of equity must be multiplied by 0.2 and the cost of debt by 0.8.

The greater the cost of capital for projects undertaken by the utility, the greater the need for direct or indirect subsidies by Government and/or higher tariffs for consumers. In other areas, WACC is typically used as the benchmark to assess the financial viability of a project and is the discount rate that should be used in the financial benefit-cost analysis.

2.2 Cost of Equity Capital

Most Caribbean Utilities are Government owned. Therefore, their equity capital is derived from internally generated funds or Government. For the few privatised Utilities, equity capital could come from the parent company of the utility's owner or internally generated funds (retained earnings). It must be reiterated here that internally generated funds or for that matter a Government grant is not a free source of capital.

The cost of equity capital is the opportunity cost of the funds from the utility owners. This opportunity cost is assessed as the return on the investment that owners could earn on the same funds under the same level of risk. For firms operating in developed capital markets, the Capital Asset Pricing Model (CAPM) is normally used to calculate the cost of equity. Details on CAPM are outside the scope of this paper. For Government owned
utilities, because the capital markets in the region are undeveloped and given the capital structure of the utilities, the best estimate of the cost of equity is the rate on a suitable Government security, usually called a 'risk free rate'. This 'risk free rate' is adjusted by a spread for the additional credit risk for the utility being assessed. For instance, in April 2003, the risk free rate for Government of Trinidad and Tobago paper was estimated at 6%. Based on its continued unhealthy financial and operational performance, the spread for the Trinidad and Tobago Water And Sewerage Authority should be at least two to three percentage points, giving a 8% to 9% cost of equity capital for that utility.

As in most enterprises, internally generated funds by water utilities are generally insufficient to meet the capital intensive funding requirements of projects. Even where utilities operations yield cash surpluses, attempting to finance capital projects could, in a short time, lead to cash flow problems. Financing projects from Government funds, should be discouraged as it has been recognised that political interference in the day-to-day management of the Utility is an unwelcome by-product of such funding. In addition, economists indicate the difficulty for Government financed utilities to apply the true economic price of water, leading to the inefficient usage of the resource by consumers

2.3 Cost of Debt Capital

Providers of debt capital demand a reward for the risks involved in providing the capital. This reward varies in terms of the cost and at times rights over the assets and trade of the utility being financed. Generally, the greater the risks assumed by the provider, the greater the cost of capital. The main categories of risks that a provider of capital would normally assess include:

(a) Political and country
(b) Economic
(c) Commercial
(d) Construction
(e) Project Performance

Political and Country Risks

In the Caribbean, political risk stem in the main from changes in the political directorate during the course of implementation of a project. Such changes could result in:

(a) withdrawal of support for the project and frustration of signed agreements; and/or
(b) unreasonable requests for changes in project scope and/or terms and conditions for loans.

The Country or sovereign risk captures the possibility that during a foreign currency crisis, the nation might limit all foreign currency payments by entities subject to its jurisdiction. Country risk is assessed by the three main rating agencies in the USA. (Other rating agencies exist; however, their ratings are not highly regarded). Anything less than a BBB rating on the Fitch/Standard & Poors scale or its Moodys equivalent is not considered an investment grade. Some of the Caribbean countries considered in this review including, Trinidad and Tobago, Barbados, Cayman Islands and Bahamas have attained investment grade or higher ratings.

Economic Risks

Economic risks arise primarily from:

(a) the financial status of the borrower limiting its ability to provide its share of project financing in a timely manner;

(b) changes in interest rates during the payback period of the project (given the prevailing low interest rates in the world markets, this risk is currently significant for projects financed at variable interest rates);

(c) fluctuations in exchange rates, (an insignificant risk for most Caribbean countries but severe for Jamaica and Guyana); and

(d) high inflation rates, (a low risk given the prevailing low inflation environment worldwide).

Commercial Risks

Commercial risk for water and sewerage projects in the Caribbean, could arise from:

(a) Unrealised demand for the services provided; and

(b) Unwillingness by customers to pay for the services offered and/or unwillingness of regulators to approve increases in tariff.

This risk would be assessed to be high for at least two Caribbean countries, St. Lucia and Barbados where, in the past, there have been problems in getting property owners to connect to the sewerage systems. Similarly, because of its high receivables position, the commercial risk of the National Water and Sewerage Authority of Grenada would be high.

Construction Risks
Construction risks arise from delays in project implementation and/or cost overruns as a result of:

(a) poor project design;
(b) inadequate project management; and
(c) inexperienced contractor engaged to undertake complex construction recent sewerage projects in Barbados and Grenada).

Project Performance

Project performance risks could arise from:

(a) improper use of complex technologies (e.g. in one situation where desalination plant designed to treat filtered brackish water was fed with water directly from the sea);
(b) underperformance of equipment; and
(c) inexperienced operators of complex technologies (WASA Trinidad and Tobago which pioneered SCADA technology in the Caribbean in the 1980's had limited success. A similar situation was repeated in ST. Lucia in the 1990's).

2.4 Lenders and Risk

Because of their risk profile, traditionally, utilities in the Caribbean are generally unable to borrow money directly in international capital markets or can only do so at high interest rates. Therefore, to-date, the majority of external funding for water and sewerage projects has been through bi-lateral and multi-lateral funding agencies. The terms under which bi-lateral funding is made are based largely on political considerations that are outside the scope of this paper.

All three major multi-lateral agencies operating in the Caribbean have so called 'soft' (low interest or interest free credit) and 'hard' (higher interest rate) windows'. The resources of the 'soft' window are derived from contributions from the developed world while the resources from the 'hard' window are derived from the Banks' paid-up capital and/or the international capital markets. These Banks utilise their AAA credit rating, to issue bonds to raise money, at low interest rates, in the international capital markets. The low interest rates are then passed to borrowers. The final 'cost of debt capital' to a borrower is then derived from a mixture of political, country and economic risk considerations. Multilaterals address the other project risks identified above through a mix of loan conditions.
Funding from bi-lateral and multi-lateral sources to finance water supply and sewerage projects is at its lowest and reflect current trends for Caribbean Countries across all sectors. In addition, while these agencies offer low cost of capital (currently between 2 to 5.75%) coupled with a structured project delivery system, there are a number of negative issues associated with such funding, including:

(a) lengthy period between application for financing and the final completion of the project;

(b) project administration by officers with little or no utility management experience who apply rule-of-thumb solutions to otherwise complex utility management issues, leading to the application of unworkable project activities, unrealistic loan conditions and their rigid enforcement and cost overruns; and

(c) lengthy and inflexible procurement procedures.

This paper will now examine other providers of capital as a means of relief from the dilemma faced by Caribbean water utilities. These sources range from commercial loans at one end of the spectrum to direct investors at the other.

Providers of commercial loans (commercial banks and other finance houses) are by and large risk adverse. They assume no risk. If for whatever reason a borrower is unable to service its debt, a bank's first option is to call in the loan. The cost of capital from these sources should be the lowest of the so-called 'other providers of capital'. However, because there is no trade in the main assets of water utilities, a Government guarantee is the only recourse, making this form of lending unattractive to commercial lenders. Lately due to excessive liquidity in the banking system in Trinidad and Tobago commercial banks from that country have been offering loans to institutions for projects (which match the same level of risk and asset specificity as water supply and sewerage projects) at terms that approximate those of the multi-lateral Development Banks.

At the other end of the spectrum would be the direct investor. For instance, a contractor who is awarded a contract to upgrade and operate a water treatment plant over a specified period of time. The utility gains a direct investment in the upgrading of its water treatment assets for which it pays a specified price for water purchased. Imbedded in the price the utility is charged would be the capital cost of the facility amortised over an investment period, usually the life of the contract. The discount rate used in the amortisation process is the cost of capital. The higher the contractor's assessment of the cost of capital the higher the discount rate and by extension the price he would charge the utility. In assessing the cost of capital (the project cost of capital), the contractor must:

(a) assess his (equity and debt) cost of capital.
(b) assess and allocate the risks inherent in constructing and operating the facility;

(c) apply mitigation measures to reduce risks; and

(d) add a premium to his own cost of capital [item (a) above] to cater for risks he must bear directly.

In this example, the contractor can allocate the commercial and political risks to the owner by a take or pay provision in the contract and the economic risk by escalation provisions in the pricing of the water. However, he must bear the construction and project performance risks. The latter can be mitigated through performance bonds and/or guarantees. However, such guarantees come at a price and the risks are not entirely eliminated. A premium must therefore be applied in arriving at the 'cost of capital' for the project.

In terms of 'cost of capital', portfolio investments such as bonds and shares lie somewhere between commercial loans and direct investments. In purchasing stock issued by a company, the purchaser agrees to:

(a) share in the ownership or equity of the company entitling him/her to a share in the success (failure) of the company by way of dividends (non-payment of dividends) and appreciation (depreciation) in the stock price; and

(b) participate in charting the policy direction of the company through the Board of Directors.

In return, a stockholder accepts a subordinate position vis a vis providers of debt capital whose interest return is paid as a prior claim to equity dividends from the company's trading profit. The cost of capital for commercial debt financing should be lower than that of stock type portfolio investment as the latter investors expect higher returns for the greater risk they bear as residual claimants on profit (and, in the event of bankruptcy, on the company's assets).

Caribbean Utilities in the power have successfully raised capital through divestment of shares. (It is not known whether the proceeds of such divestment have been used to finance capital investments). This approach is possible for the corporatized water utilities, the Dominica Water and Sewerage Company (DOWASCO) and the Water and Sewerage Company of St Lucia (WASCO).

A bond purchaser shares in the success of a company through his fixed interest and principal repayments and the appreciation in the price of the bonds. However, in the case of failure, the investor runs the risk of his/her interest and principal payments being placed in jeopardy as well as depreciation in the price of the bond. Unlike a stockholder a bond purchaser has no say in the running of a company therefore bears the additional
project performance, commercial and economic risks and demands a higher return on his investment in return.

Bond financing has several avenues available for reducing risks and hence the cost of capital. For instance, a bond issue can hedge against inflation by issuing floating-rate bonds in preference to fixed raters. 'Project Financing' offers the bond purchaser the option to mitigate the risk of company failure through dedicated repayments from project revenues. Insurance wraps could also be used to mitigate economic and commercial risks making return requirements and hence the cost of this form of capital moderate.

It is noteworthy that the Trinidad and Tobago Water and Sewerage Authority has had 23 bond issues, the last being in March 2003. These bond issues have been used largely to finance capital investment projects.

3. CONCLUSION

Throughout the Caribbean there has been a perceived slowdown in the development of projects to meet the needs of the water supply and sewerage sector. Traditional sources of financing internally generated funds, Government subventions and financing from bi- and multi-lateral funding agencies will be insufficient to meet the funding needs of Caribbean water and sewerage utilities. Obtaining funds from 'other providers of capital' must be examined. This paper has shown that with proper assessment and allocation of risks the cost of capital from these other sources can be managed. Of equal importance, if providers of funds are to become interested in financing the sector, Caribbean utilities must be managed so that they could demonstrate:

a. strong financial performance;

b. efficient and effective operations;

c. stable corporate structures with less political involvement; and

d. stable and effective regulatory environments.

The Caribbean is likely to lose the advancements gained over the decades of water and sewerage services development activities if urgent action is not undertaken. It is left up to those charged with the responsibility of managing these services to ensure this does not take place.