

Guyana Water Inc.



Strategic Plan, 2021-2025

Enhanced strategic focus to achieve improved operational efficiency and productivity in the face of expanding economic opportunities and improving quality of life for all Guyanese



New Water Treatment Plant at Diamond, EBD

To deliver safe, adequate and affordable water and ensure safe sewerage systems for improved public health and sustainable economic development.

Approved by GWI Board of Directors

December 16, 2020

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GWI at a glance...

GWI was created in 2002, and serves over 172,000 customers, and produced 160 million m³ of water in 2019

52% meter coverage, with 28 Water Treatment Plants servicing 53% of our customers, and more than 250 water wells across the Country *“inclusive of the Hinterland”*

Guyana boast of a 96% population with access to potable water *“See UN Human Development Index Report (HDI) 2019/20”*

The Strategic Plan affords GWI the opportunity, as the sole provider and distributor of potable water, to map out our contribution in fulfilling the New Government's priorities in this very important sector.

Therefore, the strategies and expected outcomes of this plan is aimed at removing the triple challenge of poverty, unemployment and inequality confronting our Country.

Acronyms

GoG	Government of Guyana
MoF	Ministry of Finance
MoHW	Ministry of Housing and Water
MoA	Ministry of Agriculture
GWl	Guyana Water Inc.
PUC	Public Utilities Commission
SP	Strategic Plan
CDB	Caribbean Development Bank
IDB	Inter-American Development Bank
IsDB	Islamic Development Bank
EU	European Union
WB	World Bank
UNDP	United Nations Development Programme
UNICEF	United Nations, International Children Emergency's Fund
LCDS	Low Carbon Development Strategy
RDCs	Regional Democratic Councils
NDCs	Neighbourhood Democratic Councils
SDGs	Sustainable Development Goals
CMT	Central Management Team
BoDs	Board of Directors
KPIs	Key Performance Indicators
WQ	Water Quality
WHO	World Health Organisation
GIS	Geographic Information System
CIS	Customer Information System
EPA	Environmental Protection Agency
CR&CS	Customer Relations and Customer Service
T&D	Transmission and Distribution
WTPs	Water Treatment Plants
SIP	Strategic Investment Programme

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Chapter 1: Overview

1.1 The Utility Profile

GWl was established in 2002 under the Water and Sewerage Act of Guyana and serves as the Public Supplier of water and sewer services in Guyana¹ under a license issued by the government and functions under the ministerial control of the Ministry of Housing and Water. Establishing GWl involved the creation of the required organisation, management systems and processes to manage the water services assets estimated to have a value in excess of GY35.32 Billion², drawing on the experience and expertise of GUYWA and GS&WC, as a modern efficient and customer focused water utility. Incorporated in 2002, GWl brings the water and wastewater services of the 65 local authorities together under one national service provider. GWl became responsible for all public water services, involving the supply of potable water and the collection, disposal of wastewater within the Capital City, GEORGETOWN. We also took over all of the capital investment decisions and implementation of the capital programme delivery across the Country.

In discharging its role as the national water services utility, responsible for water services operations and investment, GWl is regulated by: a) The economic regulator, the Public Utilities Commission (PUC), which is charged with protecting the interests of the customer, while approving an appropriate funding requirement sufficient to enable the utility to deliver the required services to specified standards in an efficient manner; and b) The environmental regulator, the Environmental Protection Agency (EPA), which sets standards and enforces compliance and National Regulations for drinking water supply and wastewater discharge to water bodies. The EPA liaises with the Health Services Executive in matters of public health.

GWl is the nation's service provider of potable water and sewerage services (within the municipality of Georgetown, serving 8000 customers), with 96% of Guyana's population³ having access to potable water and over 70% of the consumers are provided with a 24-hours of service delivery from more than 200 wells and 28 Water Treatment Plants via our transmission and distribution networks. 90-95 % of all final water delivered to consumers meets the World Health Organisation's (WHO) health based guidelines. Our service covers 10 municipalities, 2416 healthcare facilities and over 250 Schools Countrywide. GWl has a customer listing of 172000, with 95% being Residential Customers and 5% being Non-Residential Customers (Commercial). 52% of our customers as metered service whilst the remaining 48% are unmetered. This high percentage of unmetered service gives rise to a number of challenges: (i) relatively low collection efficiency, (ii) high non-revenue water, and (iii) the endemic culture of wastage and inequity.

The day-to-day operation and provision of potable water and associated services are done via ten (10) Regional Offices with support and oversight from the Chief Executive Officer and his team of Directors (CMT), Senior Managers and Professional Technical Staff. Each Regional team

¹ Maps of GWl Operational Areas are available

² Audited Financial Statement, 2016

³ https://statisticsguyana.gov.gy/wp-content/uploads/2019/10/2012_Preliminary_Report.pdf

is comprised of two arms; the Operations team of staff responsible for production and delivery of the good and the Commercial Services and Customer Relations Staff responsible for provision of Customer services and revenue collection. These teams work together to deliver potable water to consumers, read their meters, deliver bills, receive cash and provide customers with one on one customer service (queries, requests, etc.).

1.2 Our Vision

To ensure an efficient, sustainable and financially viable water and sewerage Corporation delivering a high quality of service to customers, are essential for a modern country.

This Strategic Plan prepared by GWI provides an opportunity to consider, at a national level, the way that water services are delivered in Guyana. The plan takes a 5 year view towards the vision that ***“Through responsible stewardship, efficient management and strong partnerships, the Government of Guyana, GWI is determined to develop a world class water infrastructure (including Wastewater and Sanitation) that ensures secure and sustainable water services, essential for our health, our communities, the economy and environment”***. The plan has been prepared to comply with our statutory obligation and as a basis for broad public and stakeholder engagement.

1.3 Mission

To deliver safe, adequate and affordable water and ensure safe sewerage systems for improved public health and sustainable economic development.

1.4 Operating License

GWI has an operating license for the supply of water and the collection of wastewater.

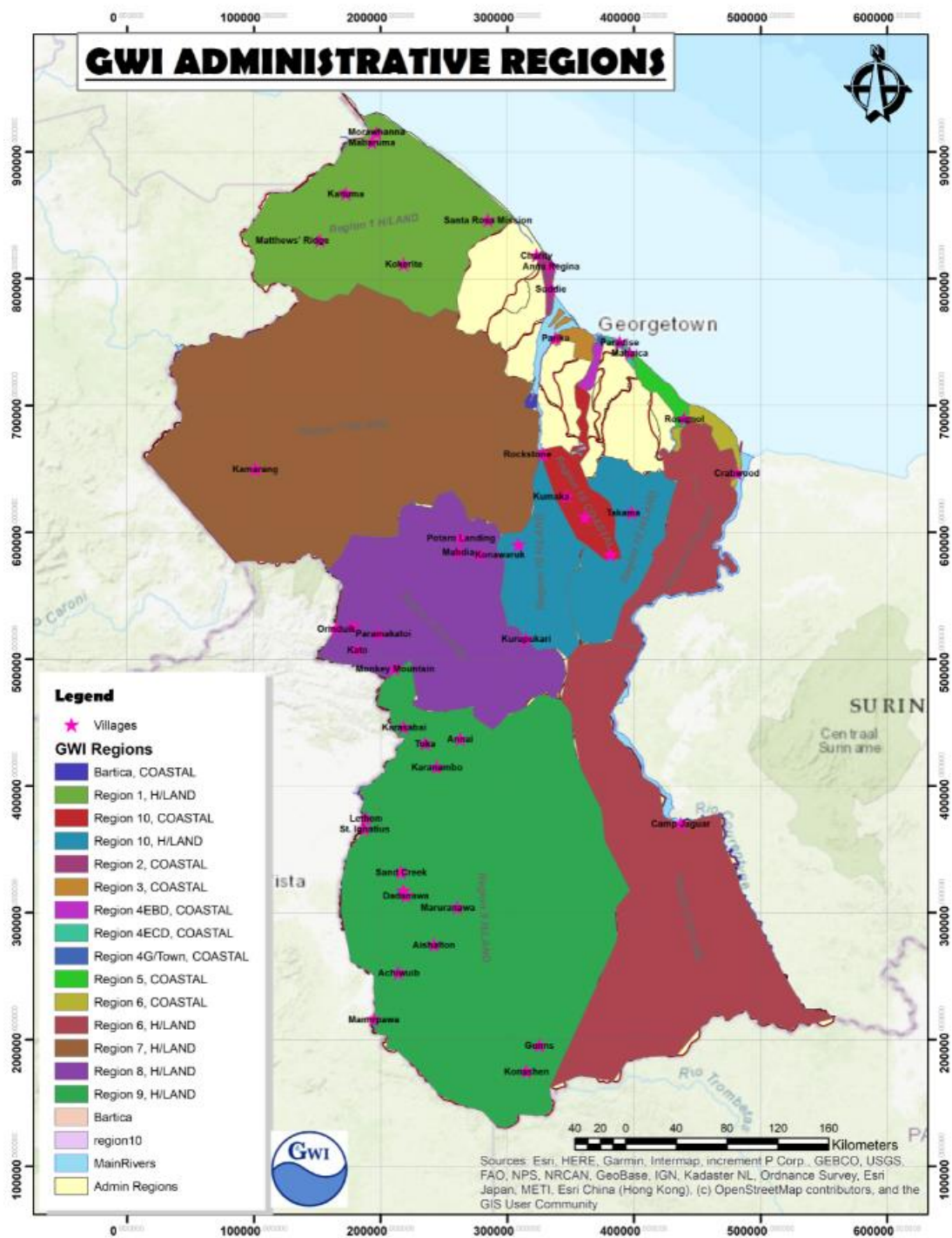
1.5 Corporate Governance

The corporate governance of the Corporation is carried out by the Board of Directors, which provides oversight and guidance in crafting the strategic focus of the utility, and the day-to-day management of the Corporation is the responsibility of the Chief Executive Officer. The structure is also comprise of the Corporate Management Team (CMT) with Executive Directors and department heads. The CMT meets regularly to review organizational performance and managerial effectiveness and approve plans for operations and administration. Going forward, this will be the forum for planning, design, and program execution meetings and the discussion of monitoring and evaluation reports.

Guyana Water Inc. Water Sources and Treatment Plants					
Region	Water Source	Number of wells	Number of Water Treatment Plants	Location of Well Water Treatment Plants	Location of Surface Water Treatment Plants
2	Well	7	1	Lima	
3	Well	31	4	Pouderoyen, Fellowship Vergenoegen, Uitvlugt	
4/GT	Well and Surface water (Conservancy)	18	3	Sophia, Central	Shelterbelt Conservancy
4/EB	Well	19	5	Eccles, Coven Gardens, Grove, Diamond	
4/EC	Well	17	3	Better Hope, Mon Repos	
5	Well	13	1	Cotton Tree	
6	Well	28	5	New Amsterdam, Port Mourant, Queenstown, No. 56 Village, Sheet Anchor	
7/Bar	Surface (Mazaruni River)		1	Bartica	7 th Avenue
10/LIN	Well and Surface water (Dakoura Creek)	3	5	Amelia's Ward	Wisroc, Wismar, West Watooka (Dakoura Creek) and LPC, Demerara River

Summary of Wells and Water Treatment Plants across Guyana

Region	1	2	3	4	4	4	5	6	7	8	9	LIN	10	Total
# of Wells	43	7	31	18	19	17	13	28	10	8	61	3		258
# of Treatment Plant	0	1	4	3	5	3	1	5	1	0	0	5		28
Surface water sources	2			1					8	1	0	2		14



1.5.2 Geographical Expanse and model of Operation

GWI provides potable water for the entire country of Guyana with the higher percentage (97%) of consumers residing along the coastline. GWI's operational structure consisted of six (6) Coastal Divisions with the Hinterland regions. However, this was revised to ensure effective management in addressing the unique challenges in the Hinterland Regions viz (1, 7, 8, and 9). Hence, Nine (9) Regional Offices namely Region 2, 3, 4-EB, 4-Georgetown, 4-EC, 5, 6, 7-Bartica and Region 10-Linden. Support and oversight is done by the Chief Executive Officer and his team of Directors, Senior Managers and Technical Staff per area of operation. Each Region is further sub-divided into zones to provide the level of granularity and details per locale required for continued improvement of the service delivered whilst achieving sustainability per locale. This model, inherently creates opportunities for enhanced community interactions, involvement and enhanced relations which has produced desirable results thus far.

1.5.3 Guyana's Water Resources

Guyana has abundant surface and groundwater resources for meeting its present consumptive and non-consumptive needs. However, the country has experienced severe droughts mainly in the hinterland, due to climate change and inadequate water management, leading to water shortages. In 2016⁴ the availability of renewable freshwater resources for surface and groundwater was estimated at 4,700 m³/capita/year which is above the United Nations stress level. The vision for the water sector is: "sustainable water and basic sanitation for all by 2030" which means ensuring that "all people living in Guyana have access to adequate, safe, affordable and reliable water services, practice safe sanitation and hygiene and that water resources are sustainably managed."

Chapter 2: Background

GWI is a Government of Guyana solely owned Public Corporation charged with the responsibility for water production throughout Guyana and sewerage services *in Central GEORGETOWN*. Its mission is directed towards equity of services of potable water with the highest quality standards at affordable rates and the furtherance of government's policy regarding watershed management. The Utility's revised strategic focus will cover the period 2021-2025.

A review⁵ of the objectives and targets for the strategic period 2017-2021 revealed that more emphasis was required on NRW reduction, bill collection efficiency among other key challenges, aligned to the operational strategic objectives of the Utility and demonstrated the supportive inputs required for mission success. Not solely to produce water but its elements for improved access, level of service and water quality in a sustainable manner. In the absence of a comprehensive mid-term evaluation and the deficits identified during the review of the current plan a decision was taken by management to formulate a New Strategic Plan with a revised focus that will offer greater guidance and improve the performance of the Utility in the areas of NRW reduction, bill collection efficiency, debt collection/management, water quality

⁴ United Nation Report (2015)

⁵ The desk review is an important part of the assessment — by collecting, organizing and synthesizing available information, the team gains an understanding of the context, priorities and trends, and equally important, identifies gaps to address during the field work or new planning cycle.

and energy efficiency. Under, the new management, GWI will seek to realign the strategic focus with the aim of mainstreaming management for results. By consolidating more than 95 indicators in the current plan to approximately 30, ensuring that all levels of management are involved in the process to encourage greater ownership and accountability for the performance of the indicators. In addition, management will work to ensure that the PUC's approved new tariffs are optimized to generate greater inflows/revenue to cover costs, such as the fix charge "*for infrastructure maintenance*".

The Operations and support departments has identified critical factors for mission achievement through their analyses, such as the reduction of NRW with rapid responses to leaks, and universal metering. The reduction (*or introduction of new technology where necessary*) of chemical intensive processes for its water treatment facilities, including the expansion of the customer base. It plans to replace and/or upgrade the aging water network (*infrastructure*) in Georgetown which will link all the distribution lines for increased redundancy and improve service delivery. In addition, GWI is currently undertaking a comprehensive review of its organisational and managerial structures to bring about greater coordination and synergies among the departments. This is with the aim of supporting the achievement of the objectives and goals set-out in the revised strategic plan, including more efficient use of its human resources to ensure improve quality standards through the use of monitoring and evaluation tools. To address the challenges with billing accuracy and customer complaints, GWI plans to conduct an in-depth review of the current Customer Information and Billing System "*HiAffinity*" with the possibility of upgrading and/or replacing with a more nimble system. The Utility will also strengthen its focus on solar technology (*especially in the Hinterland Communities*) for its energy usage in keeping with the efforts to transform GWI into an 'environmentally friendly utility'.

The 2017-2021 Strategic Plan was developed with a funding gap in excess of GY\$12 billion. The financing gap impacts key performance indicators in the programmatic areas of: (i) Water Production and Quality, (ii) Water Distribution, (iii) Sanitation and Sewerage, and (iv) Finance and Customer Services, and by extension the achievement of the objectives of the Plan. Recognising this critical challenge, the new management of GWI intends to engage central government, development partners, including other financial institutions in the pursuit of opportunities to mobilise the necessary financial and technical resources to support the achievement of the strategic objectives identified in the revised strategic plan 2021-2025.

Chapter 3: Key Challenges and Strategic Opportunities

Whilst 65% of customers receive a good level of service⁶, concerns about our service base on quality, capacity and reliability still persist. Despite the good-work over many decades, under-investment combined with a lack of comprehensive asset management and maintenance programmes has led to a legacy of deficits in a number of our treatment facilities and networks. In many areas, limitations on treatment and/or network capacity urgently need to be

⁶ Customer Satisfaction Survey, 2018.

addressed to accommodate new housing areas and/or urban sprawl, including commercial and industrial developments.

In our Capital City Centre “Georgetown”, we continue to depend in part on a 19th century system which is no-longer fit for purpose in its current condition, and exposes these supplies to an unacceptable risk of failure. Outside of our major urban centres, our water supply network in some areas are fragmented with many small and vulnerable water sources, especially within the Hinterland Communities. With approximately 47% of our water production not being fully compliant with WHO’s Standards (i.e. iron) in many of our schemes and up to 40% (or 11 Water Treatment Plants) of water treatment plants are considered to be “at risk” of failure in terms of meeting 100% quality parameters “specifically iron removal”⁷. In addition, the utility has a high-level of Non-Revenue Water (NRW Index)⁸, due to leakages within our water systems, including a large unbilled consumption as a result as a result of a 48.3% unmetered services.

Wastewater must be collected and treated before it is returned to the environment. The most recent assessment of urban wastewater identifies that wastewater treatment is not at the required standard in our larger urban areas and that the areas discharge raw sewage (sewage that is untreated or has had preliminary treatment only). As a result of Guyana’s failure to meet the requirements of the Cartagena Convention on Wastewater Treatment Directive, Government programmes can be impacted. Many of our sewers in urban areas receive rainfall run-off from roads and hard surfaces in addition to wastewater. These combined sewers are frequently overloaded during periods of heavy rain resulting in the flooding of some properties and giving rise to overflows which can cause pollution within our rivers and streams.

Apart from these compliance challenges, economic growth brings a requirement for additional capacity to support housing development, together with offices, factories and commercial buildings supporting employment. There are areas zoned for development which are currently constrained by limitations in system capacity for water and wastewater. This additional demand must be met without risk to existing customer service standards. Key national policy objectives for employment and increased housing (*HOUSING Construction 2020 and beyond*) must be provided for. The Housing Supply Co-ordination Task identifies water services infrastructure deficit among the constraints to be overcome if housing needs are to be met within the medium and long-term.

Substantial improvements to water supply capacity, quality and reliability are required in addition to upgrading/expansion of our wastewater infrastructure, both treatment plants and collection networks, in order to protect the environment. This will require significant capital investment over many years. Even with additional funding, the timescale to address all of the challenges is likely to extend through a number of investment cycles so that we must prioritise projects which should proceed in order of criticality.

⁷ Generally, all of our treatment plants are producing water that is microbiologically safe, being consistently compliant with the WHO guidelines (i.e. free of E-Coli and low total coliform counts). Regarding the overall core WHO parameters analysed by GWI however, (pH, turbidity, iron, colour, Aluminium, chlorine and micro-B), only 17 out of 28 treatment plants (i.e. 60%) are in full compliance with all of the core parameters.

⁸ NRW Index estimated 69.7%, end 2019.

Chapter 4: The Plan Focus, 2021-25

The Strategic Plan affords GWI the opportunity, as the sole provider of potable water, to map out our contribution in fulfilling Government's mandate in this very important sector. In this regard, the plan provides strategies, programmes, and outcomes aimed at removing the triple challenges of poverty, unemployment and inequality confronting, including improved health of Guyanese. The innovative process of placing GWI on a new path for improved performance including the process of realigning the utility's strategic focus which falls within the ambit of management remains a key priority and is being addressed accordingly. The re-organisation of the structure of GWI to facilitate improved service delivery, exemplary leadership of the water sector, and excellent stewardship of one of Guyana's great natural resource to ensure its translation into clean audits and improved performance are critical areas that form part of the deliverables for the New Management. A team of professionals are assisting the Utility in this regard and it is gratifying to note that for purposes of expediency and enhanced service delivery the recommendations of the team are being implemented as the process unfolds.

Management intends to rigorously pursue government's strategic policy direction for the potable water sub-sector with renewed energy during this strategic cycle in pursuit of realising our objectives of improved efficiencies, including financial viability and sustainability in the face of a Global Health Pandemic "nCOVID-19". To ensure that we have water security for basic human services, including economic development, it is critical that sufficient funding is made available for capital investment, including operational and the maintenance of efficacy in the sector. In this regard, we will be using the programme budgeting approach to provide operations and the supporting departments with the necessary resources to deliver increased access and improved quality of service "specifically 90% treated water coverage by 2025" as articulated in this strategic cycle. In addition, the utility's programs will be planned in tandem with regional needs and a process for communicating will be established with the RDC's and NDC's to provide service information and obtain insights into regional development plans.

Therefore, to ensure increased access, improved water quality, and equity the transformation of the potable water sector is necessary to create a conducive environment for economic, social and related development. We are driven to utilise new technologies and tools available to improve the management of our water resources to ensure water sustainability, adopt climate resilient best practices and leverage the global profile of water to achieve an improved quality of life for all Guyanese.

4.1 Rationale for the revised Key Performance Indicators (KPIs)

For the plan period 2017-21, ninety seven (97) performance indicators were developed to monitor the utility's performance towards the main goals of the Plan. For example **(i) To ensure that it has Tariffs that are socially acceptable and can contribute to the Corporation's financial viability; (ii) Maintenance of water quality at 100% of WHO standards each plan year; (iii) The reduction of non-revenue water (NRW); (iv) The refurbishment and construction of treatment plants etc.** KPIs support performance monitoring, also help to keep focus and increase accountability among the departments responsible for their performance. The fact that they are shared across the utility helps in ensuring that all of the departments know what the others are doing and responsible for. The KPIs fall into the five (5) – broad programmatic areas: (i) Organization and Management, (ii) Water Production and Water

Quality, (iii) Water Distribution and Water Quality, (iv) Finance and Customer Services, and (v) Sanitation. In retrospect some of the indicators seem superfluous, whilst there seems to be other key aspects of management not being measured and/or addressed in the plan period.

The realignment of the indicators are to ensure that they are in-line with the core functional areas of the utility's operations namely: **Water Quality, Energy Efficiency, Non-Revenue Water, Hinterland Services, Finance, Human Resources Management, and Commercial Services, Sewerage and Water Service Access.** In realigning the strategic focus the revised KPIs proposed to monitor the utility's performance were consolidated and streamlined to bring greater efficiency and efficacy to the operations of the utility in the medium-to-long term. In addition, the revised KPIs fully utilised the concept of SMART (Specific, Measurable, Agreed Upon, Realistic and Time-related/BOUND). With an emphasis on targets that fit the above criteria and which are developed with the participation of the executive directors of the various departments and managers. This process will allow the 'buy-in' of personnel (enablers) who will in turn develop their own annual work plans derived from the new 5-year plan and these will be monitored and evaluated throughout the year. The M&E Unit will facilitate the gathering of data which will be converted into information, evaluated and discussed with directors and managers for timely decision-making, thus ensuring departmental target adjustment towards the achievement of objectives as set out in the new strategic medium-term plan, 2021-025.

4.2 Monitoring and Evaluation (M&E) Framework for the New Plan

The previous strategic planning, evaluation and monitoring framework was mainly focus on the performance indicators for the expansion of service, access, and improved delivery of service (*24hr supply*) to 5 metres. This resulted in target setting and achievement in line with that focus, and in some instances, presented some degree of difficulty in identifying achievements due largely to the lack of complete data and/or statistics. This challenge has been addressed with the creation of the restructured Monitoring and Evaluation Unit. The unit is tasked with reviewing the plan, monitoring the progress of targets and the preparation of a new 5-year plan with robust KPI's for monitoring and evaluation to facilitate timely decision-making and improve organisational performance. The new targets and indicators are essentially focus on improved efficiencies and the overall performance of the utility (*i.e. NRW*). The M&E Unit will monitor the Plan's KPIs, analyse, evaluate and provide the departments with information to improve the efficiency of their operations, including the prepare a Four (4) Monthly Monitoring Report for review by management and submission to the Board of Directors for improve planning and decision-making. The M&E Unit has used a collaborative approach to the review of the 2017-21 plan and for the preparation of the new plan.

The formulation of the New Strategic Plan and KPIs of the Utility by Management is with the objective of achieving:

- Ensuring access to potable water for all
- Provide 90% treated water coverage
- Financial viability and sustainability within the medium- to long-term
- Enhance quality of service, and
- Achieving THE United Nations SDGs Goal 6 by 2030

The four (4) broad strategic objectives identified will be achieved through THE Five (5) Programmatic Areas utilised for programme planning and implementation. The programmatic areas are as follows:

1. **Organisation and Management:** The Corporate Services, Monitoring and Evaluation, Public Relations, Human Resources, and Information Technology departments fall within this programmatic area
2. **Water Production and Quality:** GWI’s Operations Department has responsibility for this programmatic area
3. **Water Distribution and Quality:** The programmatic factors for water distribution and quality are addressed by the operations division, including Design Infrastructure, Demand and Supply and the Project Implementation and Partnership Building departments.
4. **Sanitation and Sewerage:** The Corporation does not provide wastewater treatment at present. However, GWI continues to ensure that the sanitation processes for wastewater are maintained within the boundaries of GEORGETOWN as mandated by our Operating License.
5. **Finance and Customer Services:** The performance indicators for the corporation’s commercial department is monitored largely through revenue billing and collection (*including Debt Management*). These indicators are impacted by meter coverage and evaluated via financial ratios. The monitoring process commences with customer service, purchasing and procurement, non-revenue water (NRW) and its funding (including internal and Central Government via the National Budget “Public Investment Programme” i.e. resource mobilisation.

Table 1: Key Performance Metrics of the Plan, 2021-2025

Programme Areas	Performance Measures
Water Production	24-hour availability
Water Quality	WHO Standards [100%]
Water Supply	5 Metres – First Floor level
Population and community access	Population and community coverage [99%]
Metering	Percentage of accounts metered [85%]
Organization and Management	Staff/Customer Ratio [5.5]
Non-Revenue Water reduction	55% [of system input volume]
Finance and Customer Service	Collection efficiency [90%]

Chapter 5: Areas of Support for the objectives of the Plan

The Plan sets out strategic objectives for the delivery of water services over the next 5 years, 2021 -2025. It details current and future challenges which affect the provision of water services and identifies the priorities to be tackled in the medium-term. In developing and realigning the plan, we have considered its interaction with other national and international strategies such as **the UN Sustainable Development Goals (SDGs), specifically Goal 6 and 13, including Government’s priorities for this sector and the Low Carbon Development Strategy (LCDs)**. The plan also provides the context for developing annual plans which will document the approaches and financial resources to be used for key water service delivery areas such as water distribution, water quality compliance and water resource management.

The Utility will use data and information derived from outreach programs, research projects and participation on regional administrative councils to garner information regarding service needs/gaps. The information gathered will be discussed among the operations, planning and design, infrastructure and monitoring unit to derive a consensus on the way forward to increase and/or introduce new services in communities. Projects will be focused in two (2) areas: (i) the expansion of services in current coastal operations areas; and (ii) the expansion in new areas including hinterland riverain communities.

The Plan will be subject to a reviewed by end of year three (3) to ensure that it continues to be in line with the current and future needs of the people of this nation. This review is also to ensure consistency with the National Budget Planning Framework and priorities of Government, including any new economic strategies which may be developed within the medium-term. In addition, the utility will prepare budget plans annually during the plan period setting out targets for improve efficiency and capital expenditure requirements, including performance targets consistent with the delivery of the objectives of the Plan. For each strategic objective, we have identified targets within the plan in order that the utility’s performance against the objectives can be monitored and assessed by all stakeholders. The M&E Unit will perform monitoring and evaluations functions and provide feed-back to departments regarding the performance of their KPIs. A four (4) Month Monitoring/Progress Report from the M&E Unit will be forwarded to the CEO for transmittal to the Board of Directors for review and decision-making.

5.1 Organisation and Management

Table 2: Summary of Performance Indicator, 2021-2025

Programmatic Area	Indicator	Unit	Baseline (2019)	TARGETS				
				2021	2022	2023	2024	2025
Organisation & Management	employment expenditure	%	56	51	50	49	47	45
Organisation & Management	% of employees trained	%	72	30	30	30	30	30
Organisation & Management	productivity ratio	no.	7.1	7	6.7	6.5	6.3	6.1

5.1.1 Human Resources Management

The Human Resources department is responsible for the acquisition of skills and retention of personnel who are required for the administration of the Utility’s operations. The situation analysis has been used to estimate the staffing needed in each department to fulfill their mission objectives during the plan years. The department will ensure that the Utility has the correct staffing level for maintenance of operational efficacy. It’s recommended that the productivity index (*i.e. staffing level*) should be well below the ratio of 7 that currently obtains (*this is considered to be an inefficient mix*). The benchmark for this type of industry stands at 5 employees per 1000 customer, therefore it’s expected that the staffing level be rationalize over the life of the plan to support the Utility’s objectives of improve efficiency and productivity.

Within the plan period several changes in the administration of the organization’s services, especially in relation to regional customer services and operations are expected. Therefore, it is envisaged that changes will be made to the organisational staffing and although it is not expected that the overall numbers of personnel will change dramatically, nevertheless, staff

will be re-assigned to improve the overall performance of the utility in the short to medium-term.

5.1.2 Business Application Implementation Services

The ICT Department will play a critical role in the implementation of a new Customer Management Information & Billing System and/or upgrade of the existing software. This implementation will require services such as installation and testing of hardware, integration with hardware (Cheque scanners, bill printers, reporting printers, etc.), data migration to the new Application, and integration with GIS, HRMIS, FIMS, the Corporate Intranet and an improved Reporting Portal to be completed in-house. In addition, the department recognises that there is a need for perpetual training of personnel to efficiently and effectively use the Business Applications. In this regard, the department will facilitate setup and orientation of selected trainers within the respective departments. These trainers will be selected based on experience and competence and will be responsible for ensuring every user of the subject application is trained and evaluated on a constant basis. This intervention will provide for knowledge sharing and transfer thus promoting business continuity.

Disaster Recovery (DR) and Contingency Plan: The continuity of GWI's business is contingent on the ICT Business Critical Applications and Systems being available 24 x7 to users. The Department is mandated to ensure that such applications and services are available and in the event of disruptions due to unforeseen and unavoidable circumstances, that the time for resumption of these services is minimal. Additionally, preservation of the company's data is a priority. Because of the importance and dependence on ICT Services, Infrastructure, the business applications and data, this disaster recovery plan is necessary. An offsite Disaster Recovery (DR) site will be setup and data for business-critical systems will be synchronized daily. This DR site will also host images of all System Configurations so that if a Server or System becomes inoperable, restoration can be done immediately, reducing time for re-installation and configuration. The Corporation's Library of Digital Data (LDD) will be archived at the DR location for protection and security if the primary site is affected by malware. The DR site would also be setup to operate as a scaled down version of the primary site which will allow for some degree of continuity in an emergency.

Cyber Security: The Utility has experienced several cyber-attacks over the past years which have resulted in loss of data and disruption of its operations. To mitigate these threats, the Utility has engaged the services of consultants who recommend improvements in cyber security and infrastructure upgrades and some of the recommendations are being implemented. The Utility has also reviewed its user and access policies for personnel to ensure that only authorized personnel can access programs. In this regard ICT with the expert assistance of the Cyber Security Consultant developed a Collection of Standard Operating Procedures and Policies which will govern the use and operation of ICT in GWI. These policies are expected to safeguard or minimize future intrusions and will be updated during the plan years to ensure their effectiveness as necessary.

5.1.3 Working with the Regional Administrations

GWI's commercial and customer services department will focus on regional government administrative participation and its services will facilitate greater interaction between the Utility and its customers. GWI's personnel will participate in regional community planning for new housing schemes/communities to ensure that water services are designed and

infrastructure works are completed for these communities. Customer services will have usage of electronic programs to obtain data on service levels, water quality and other demographic information and provides connectivity to the central database. Therefore, personnel will be able to conduct community outreach programs and address the service needs of customers.

5.2 Water Production and Distribution

Table 3: Summary of Key Performance Indicators, 2021-2025

Programmatic Areas	Indicator	Unit	Baseline (2019)	TARGETS				
				2021	2022	2023	2024	2025
Organisation & Management	employment expenditure	%	56	51	50	49	47	45
Organisation & Management	% of employees trained	%	72	30	30	30	30	30
Organisation & Management	productivity ratio	no.	7.1	7	6.7	6.5	6.3	6.1
Non-Revenue Water	NRW (% of input volume)	%	70	67	64	61	58	55
Non-Revenue Water	NRW (% of annual operating cost)	%	57	58	54	51	48	44
Non-Revenue Water	% of customers metered	%	53	59	67	75	82	85
Water Production	% of coastal wells monitored	%	0	22	39	56	73	91
Water Production	energy index	kWh/m3	0.29	0.27	0.25	0.22	0.21	0.20
Water Production	% of planned operating hours lost	%	0.8	0.7	0.6	0.5	0.4	0.3
Water Distribution	% of population receiving water service	%	96	97	97	98	98	99
Water Distribution	treated water coverage	%	53	60	65	70	85	90
Water Distribution	percentage of leakage complaints resolved	%	40	100	100	100	100	100
Water Quality	% of iron tests in compliance	%	46	50	75	90	95	95
Water Quality	% of total coliforms tests in compliance	%	90	100	100	100	100	100
Water Quality	% of e coli tests in compliance	%	98	100	100	100	100	100
Water Quality	% aesthetic parameters (colour, turbidity, pH) tests in compliance	%	86	90	90	95	100	100
Sanitation	% of sewerage related complaints resolved	%	88	100	100	100	100	100
Sanitation	station availability	%	92	100	100	100	100	100

5.2.1 Water Production and Quality

The Operations Department has responsibility for this programmatic function and the related targets in the strategic plan 2021-025. The department is tasked with the responsibility for ensuring improved access, level of service (delivery 24-hour supply) and water quality (100% WHO Standard) in all operational areas/zones. Its geographic span covers regions 2, 3, 4, 5, 6, 7-Bartica and 10 – Linden, operating over 140 wells and 28 water treatment plants. Region’s 1, 8 and 9 is currently in the process of formalising its operational activities given the advent of the newly formed Hinterland Services Department has responsibility for coordinating support for the more than two hundred (200) hinterland communities in these regions.

The strategic objective is to be able to provide twenty-four (24) hour supply with 5 Metres (first floor service level) is critical. The demand for 24-hour distribution and supply is affected by the limited hours of supply which causes 90% of the customers to be on the network simultaneously during the limited supply hours. This situation creates large flow volumes and low pressures and irresponsible usage when customers leave their taps on to obtain water during the non-peak hours. Among the benefits of 24-hour coverage is it eliminates intrusions

when lines have openings that will allow inflows of contaminated water. To alleviate this situation, GWI planned to increase the hours of distribution from the treatment facilities. This program will require the drilling of additional wells, constructing new treatment infrastructure, more DMA's and aggressive leak detection and repairs to reduce water losses (NRW).

5.2.2 Energy Efficiency

The Utility had embarked on an energy efficiency program to improve electromechanical efficiency of our pumping units at many of our well sites from 2010-2014. This has been successful and the company was able to save approximately GY\$30 million per month. These initiatives required several actions: (i) conducting energy audits of pumping unit, water treatment plants and buildings and implementing the recommendations of the audit findings. From the recommendations some of the inefficient pumps were replaced and motors were downsized, fluorescent lights in buildings were replaced with their LED counterpart and enclosed office spaces were equip with motion sensors. Some air condition units were also replaced with the inverter type unit; (ii) Optimization of the distribution network (reduction of our physical losses). This is continuous and a more proactive leak repair program was put in place; (iii) Adaptation of Variable Frequency Drives since water distribution is continuous. A pilot study was done however the implementation did not materialize; (iv) Optimization of our well recharge rate to "right size" pumps and motors for the distribution systems; (v) Well site metering for energy consumption validation; (vi) Solar security lights, and CCTV for all production sites.

GWI plans to recommence a rigorous energy efficient program in every region and at every facility. To this end, the regions will need to be equip with the relevant measuring equipment and the necessary competencies to see that every new and modified installation is optimized in keeping with the KPI set out in the strategic plan. Finally, energy efficiency must be considered from the point of the source (*the well*) to the customer. Unless each is optimized, the saving in one area would be negated by the loss in another. In future as we consider an area for energy savings, all aspects of the system must be considered. A good and productive borehole will allow us to use a pump with a lower pumping head. A better quality power supply will enable us to better utilize the energy supplied and keep our motors in operation for longer before becoming defective. And, unless the pipe works are correctly sized to minimize head losses in the pipe and we tighten the network from leaks then what is pumped will certainly go to waste. The plans are in keeping with works that resulted in the utility saving GY\$30 million/month. While reduction of consumption at our offices is important, the impact and results will be yielded from investment at our well sites and therefore much focus is expected to be placed in this area. Plans going forward will include but not limited to: (i) *Redo the energy efficiency audits at the wells and water treatment plants* and implement the recommendation of the audit via an action plan over the next three years. (ii) Procurement of well camera to effectively monitor borehole maintenance works (cleaning of well screens); (iii) Installation of Variable Frequency Drives (VFDs) at all site for controlling pressure at the pump; and (iv) Reducing energy consumption at our offices.

5.2.3 Geographical Information System (GIS)

GWI has a geographically spread network of infrastructure which delivers water to all our customers. The schematics and coordinating data for this infrastructure is either in the form of hard copies or electronic files which are not consolidated to provide intelligent information. Sourcing and securing cadastral and coordinating data proves to be a time consuming and

laborious task therefore, GWI will implement a GIS which will be complete with an authoritative repository of information of all assets for all its infrastructure. This GIS solution will be used to effectively plan for maintenance replacement and growth of infrastructure, network analysis (system tracing and hydraulic modelling), introduce dynamic interaction between field and office workers and provide for real time information flow, access to geospatial data to allow for collaboration between office and field staff.

5.2.4 District Metering Areas Program (DMA)

The District Metered Area (DMA) is an isolated geographic area in which the consumption of a specific number of customers is measured and reconciled with the inflow and /or outflow of water into the area. The transmission and distribution system is fitted with valves that defines boundaries in which flow into and out of the specified area is measured. The readings from the bulk meters when compared with the actual (or estimated) customer consumption gives an indication of the losses due to leaks or illegal consumption. GWI employs the use of data loggers, which reads the bulk meters in real time and transmits these readings to a central hub for use by its engineers. There were at the end of 2016 approximately 15 active DMAs whose implementation has seen marked reduction in water losses within the areas where they were activated and properly monitored. For the DMA program to be expanded and sustained, adequate human and technical resources must be readily available. Over the years GWI has grappling with not having enough data loggers for use on all the DMAs, thus the activating and monitoring of DMAs had to be reduced. There is also the need for relevant personnel to regularly monitor the DMAs to get accurate data of water loss. Also, there is the need for DMAs to have approximately 100% metered customers in the designated areas, thus the need for resources (*capital*) to make this a reality.

The current plan suggests the use of District Metering Areas (DMAs) as a critical element for planned leakage control and the reduction of NRW. GWI is examining this program and the newly formed planning and implementation department is tasked with the responsibility for examining and recommending to the Operations Department the areas that are most suitable for the placement of the meters which will provide data on consumption to be used for planning services. The placement of these DMA's in metered areas will provide data on non-revenue water, thus contributing to water loss management and control.

5.2.5 Water Resources Management

The Utility views its mission as a critical requirement for the government's policy to have an effective water resources management program. This is in keeping with the concept of effective and efficient water resources management. Although Guyana is known as 'the land of many waters', nevertheless, it is understood that water resources are not infinite and require careful management. This is especially relevant when it is observed that ground water can be easily polluted through the excessive use of chemicals and it becomes an expensive proposition for GWI to remove contaminants from water to render it safe for supply to citizens of Guyana. In this regard, GWI plans to conduct a comprehensive aquifer study/analysis to mitigate the potential risk of saline intrusion and possible depletion of groundwater source on the coastal belt and the Hinterland due largely to climate change.

GWI's concern with water resources management⁹ is shared internationally with other water utilities companies. This is highlighted in the report by the AWWA¹⁰ in which respondents ranked Renewal and replacement of aging water and wastewater infrastructure, financing for capital improvements, public understanding of the value of water systems and services, long-term water supply availability, public understanding of the value of water resources, watershed/source water protection, public acceptance of future water and wastewater rate increases, water conservation/efficiency, and cost recovery (pricing water to accurately reflect its true cost) as some of the most important factors that water utilities must consider for its future operations. The Utility is looking forward to the establishment of the much-anticipated National Water Council which will foster closer collaboration between GWI (*in terms of data collection, coordination and monitoring of the water resources we tap into*) and the national body that is charged with the responsibility for water resources and watershed management.

Climate change is but one of many dynamic processes impacting water resources management. Other processes (for example, change in population size and location, economic development and land use, aging infrastructure, ground-water development, and changing social values) also have major influences on water resources and must be considered along with climate change in a holistic approach to water resources management. Climate change has the potential to affect many sectors in which water resource managers play an active role, including water availability, water quality, flood risk reduction, ecosystems, coastal areas, navigation, hydropower, and other energy sectors. These changes may have adverse or positive impacts on one or more sectors. Any or all of these changes could occur gradually or abruptly. *Key Point 1:* The best available scientific evidence-based on observations from long-term monitoring networks indicates that climate change is occurring, although the effects differ regionally.

Key Point 2: Climate change could affect all sectors of water resources management, since it may require changed design and operational assumptions about resource supplies, system demands or performance requirements, and operational constraints. The assumption of temporal stationarity in hydroclimatic variables should be evaluated along with all other assumptions.

Key Point 3: Climate change is but one of many challenges facing water resource managers. A holistic approach to water resources management includes all significant drivers of change.

5.2.6 Water Security

A major strategic objective of GWI is to ensure that there is security for the surface water supply sources. The Corporation also draws water from ground sources such as Wells and these must be safeguarded against malicious intrusions that would affect the safety of their supply. It is the open sources of groundwater that poses the greatest challenges. This matter has been addressed by government with the creation of the Watershed Management Program and it is expected that all stakeholders such as GWI [and other governmental agencies charged with commercial and residential or agricultural water supply are mandated to ensure that their supply sources are secured from malicious intrusions. This extends to the hinterland areas where it is specially required that areas where mining is being pursued should be carefully examined by the government agencies that prospecting licenses or permits should ensure that

⁹ Water resources management is shared with the Ministry of Agriculture's Hydro-Meteorological Department which is responsible for the issuance of permits for Wells drilling.

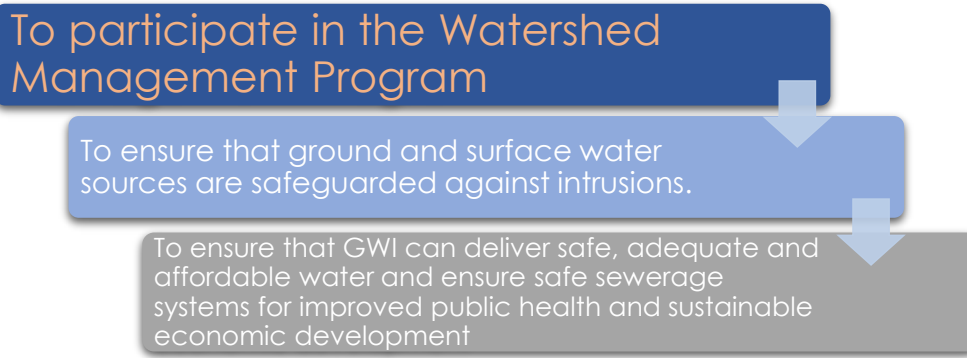
¹⁰ AWWA (American Water Works Association) Journal - | Nov. 2016, Volume 108, Number 11

works and use of chemicals do not enter the surface water supply (creeks or rivers) directly or seep into the ground and enter the supply chain.

5.2.7 Surface Supply Sources – Georgetown and other areas

GWI provides water in Georgetown from a surface source extending from the Conservancy through the Lama Canal located near its treatment plant at Shelter Belt and this source is included in the Watershed Management Program. Additionally, the Corporation provides water from surface sources at Linden and Bartica. These locations pose special concerns for water security since they are easily accessible to non- Corporation personnel. Therefore, the Utility has commenced an exercise to examine the vulnerability of the supply sources and to develop strategies to ensure that unauthorized access is restricted for non-corporation personnel. This concern is addressed in the objectives of the new Strategic Plan.

Managing Water Security – Strategic Objective



5.2.8 Expansion of Water Access

The most recent UN Human Development Index (HDI) Report 2019/2020¹¹ shows that 96% of the Country’s population have access to improved water sources. Therefore, the Utility with the support of government plans to address this gap and expanding the cover the remaining 4% while simultaneously expanding the current treated water coverage from 53% to 90%.

5.2.9 Infrastructure Planning and Implementation

The Utility is in the process of reorganising the Design Infrastructure and Demand and Supply Department (DI&DS) into the Planning Design and Implementation (PDI) Department. The department will work closely with the operations department in planning, designing and executing new infrastructure works, in accordance with the technical designs and ensure timely delivery in-line with the strategic plan. The overall consequence of this change will result in better planning, design and improved implementation of capital projects which will be operationalised in a timely manner and provide operational sustainability. Regarding capital projects, the department will plan and design the projects in coordination with the Operations Department and in such instances where it is found that there are desired design changes, these can be quickly resolved through coordination and discussions. This process will allow GWI to submit proposals for capital projects/initiatives to the government and international institutions that are in keeping with its mission objectives. Thus, it can provide the assurance

¹¹ Bureau of Statistics, Population and Housing Census 2012.

to stakeholders that projects are derived from the collective inputs of the Utility’s operations, planning and design and project implementation unit.

5.3 Finance and Customer Services

Table 4: Summary of Performance Indicators, 2021-2025

Programmatic Area	Indicator	Unit	Baseline (2019)	TARGETS				
				2021	2022	2023	2024	2025
Finance & Customer Services	% of customers billed	%	98.8	100	100	100	100	100
Finance & Customer Services	Collections efficiency	%	40	70	75	80	85	90
Finance & Customer Services	arrearage	%	75	65	60	55	50	45
Finance & Customer Services	% of customer services related complaints/requests resolved	%	36	93	95	98	99	100
Finance & Customer Services	*Operating Revenues	\$ mil	5,890.01	6,924.29	7,237.64	7,550.99	7,864.34	8,177.69
Finance & Customer Services	Operational & Maintenance (O&M)	\$ mil	-8,345.53	-7,490.35	-7,652.28	-7,817.77	-7,986.91	-8,159.77
Finance & Customer Services	EBITDA	\$ mil	-947.39	-566.07	-414.64	-266.78	-122.57	17.91
Finance & Customer Services	Net Profit/(Loss)	\$ mil	-2,918.56	-951.48	-858.59	-795.80	-740.32	-692.40
Finance & Customer Services	EBITDA	%	-13	-8	-6	-4	-2	0
Finance & Customer Services	Net Profit/(Loss)	%	-39	-11	-10	-9	-8	-7

5.3.1 Financial Management and Control

The Plan identifies the financial resources needed and sets out indicators that will demonstrate its expected financial impact over the strategic cycle. The indicators identified demonstrates that the Utility have a reasonable degree of confidence that it will achieve atleast a 90% cost recovery of its operational costs by the end of 2025. This is contingent on the expansion of the customer base, debt write-off and cost containment measures resulting in improved production efficiencies along with a reduction in non-revenue water, including that the financial resources to implement key activities and programmes within this planned cycle is made available and accessible to GWI.

A significant aspect of the Utility’s financial performance is its debt collections which currently is reflected as 70% of all current payments and the total debt profile represents approximately 69.7% of 2019 total collections [*or GY\$3.2 billion dollars accumulated over several years*]. There is a proposal to significantly reduce this debt amount with some level of write-off with the use of standard accepted accounting practices for debt write-off each year. This would ensure that the debt amount is kept within acceptable limits, thus reducing the Allowance for Doubtful Debt on the balance sheet for subsequent years. The Utility has set a KPI for debt reduction and expects to achieve its objective of <45% debt to revenue by the end of the Plan period. The finance department will also ensure that uncollectable debt is listed on a schedule based

on information which is provided monthly from the Debt Aging Schedule. This schedule will be used for the annual write-off which will be presented to the Board of Directors for approval annually.

5.3.2 Commercial and Customer Services

The Utility's commercial and customer services department will continue to be reorganized to facilitate electronic interaction for customers to receive information regarding level and quality of service, access their accounts, pay their bills and report service issues. The objective of this department is to ensure that billing is accurate, that it is delivered to customers in a timely manner and payment is received promptly. An electronic program with an App for meter reading, via cellphones and tablets will be developed for use by the Utility's personnel.

The Utility currently register of accounts stands at approximately one hundred and seventy two thousand (172,000) customers in its database. However, preliminary examination of the database reveals that this number appears to have some inconsistencies. It's believed that the customer count is not fully reflective of the number of residences and/or businesses that receives a service. Therefore a more robust exercise has been planned to include the use of GIS mapping to correctly identify customers and 'cleanse' the database of any anomaly. This will produce data which will be used for accurately calculating the number of customers in the database and allow for their correct classifications for Tariffs application. Additionally, the Utility has begun offering incentives for persons who are receiving services and are not in the database to come forward and sign-up for services and avoid the penalties for illegal usage of the water services.

The Debt Recovery Unit is tasked with debt management and it will contribute to targets that will be monitored under the plan. Currently, collections and payments management is inefficient to the extent that approximately 70% of all payments represent debt payments and the remaining 30% is current payments. The unit plans to conduct customer outreaches via call-center operators and debt recovery personnel within the various regions will encourage customers to pay their bills within the 28-day period. Customers who currently have large debt balances will be encouraged to sign payment plans for the liquidation of their arrears. However, in such instances where all efforts to get customers to address their debt balances have failed, the Utility has a policy to pursue litigation. A report on accounts which cannot be litigated will be sent to the finance department each month for inclusion in a schedule of accounts to be written off.

5.3.3 Sewerage and Sanitation Tariff

GWl is concerned with the current all-inclusive tariff charges for sewerage and sanitation, especially since it plans to expand its services to include upgrades, rehabilitation and construction of new facilities for sewerage and sanitation covering urban Centre "GEORGETOWN". Currently, sewerage and sanitation charges are fixed and while there are no breakout figures for the services, it can be assumed that GWl's overall adverse financial position can be improved with additional charges for the services which are provided. Hence, the Utility plans to discuss a change in the tariff structure with the PUC to allow a two-tiered tariff with fixed (basic current charges) and a percentage charge (e.g. 10% of water consumption charges) for actual usage. This can be justified since consumers will be charged for the basic service connection and pay for actual usage in tandem with their water usage

which activates the corporation's wastewater processing system. In the case of non-usage of the sewerage system, only basic charges will incur for maintenance of the service connection.

5.4 Our Current Strategic Priority

In this strategic cycle, we need to address urgent challenges in the quality of our service delivery and in the integrity of our infrastructure, subject to adequate funding being available, while ensuring that water services that currently meet required standards continue to do so and improve those gaps that exist. We have therefore prioritised the following areas within this plan period:

1. **Demonstrating our commitment to the delivery of an improved quality water and wastewater service** through the appropriate management of our assets in an economic and efficient manner ensuring least cost for our customers;
2. **Remediating the drinking water quality challenges** where customers have a Boil Water Notice or water supplies fail other mandatory requirements of Potable Water Standards (e.g. iron levels). We are also prioritising high risk plants identified for improvements;
3. **Complying with the Water Treatment Standards** and, in particular, addressing the inadequacy of wastewater treatment in *GEORGETOWN*;
4. **Reducing leakage** from our water mains through our water conservation programmes and NRW Programme. Completion of the domestic metering programme in line with Government policy will create customer awareness of their water usage and support behavioural changes in water consumption. It will identify the location of customer side leaks which can be addressed through our "first fix policy". In addition, the programme will add to our knowledge of where lead service connection and supply lines are located "Network Mapping/GIS initiatives";
5. **Capturing accurate information** on the nature, condition and performance of all of our assets (infrastructure and equipment) into quality assured databases, especially critical assets whose failure would have significant customer impacts, in order that we can better target investment in asset maintenance/rehabilitation/upgrades; and
6. **Catering for future growth.**

The plan will address broadly the delivery of the four strategic objectives in the following way: **(i) Meet Customer Expectations; (ii) Ensure a Safe and Reliable Water Supply; (iii) Support Social and Economic Growth; and (iv) Invest in Our Future.** These are not in a particular order of priority. For each strategic objective within the plan, we outline the current situation, identify the key challenges and propose a number of aims and strategies to address the objective. We have suggested targets within the plan in order that our performance against the objectives can be monitored and assessed by our regulators, other stakeholders and our customers. It should be noted that a number of strategies are cross-cutting between strategic objectives. For example, strategies for achieving effective wastewater management will also result in protecting the water environment.

**Objective 1:
Enhanced quality of
service “Meeting
Customer
Expectations”**

Our aim under this objective is to **ensure both customer trust and a reputation for excellent service through delivering our set of defined strategies; thereby, building the trust and confidence of our customers.**

We recognise the need for the provision of high quality, reliable water services, delivered through climate resilient systems in an efficient and economic fashion. Our first response to ensuring delivery in an efficient and economic fashion has been to review all proposed capital investment in the water services assets to more accurately define the scope required and confirm value for money. However, even with savings identified by re-scoping and introduction of new technologies, the level of investment required remains significant and we must prioritise the required projects against the available funding.

Our economic regulator (the PUC) and Operating License, has set out the levels of service which we are required to meet in the Customer Handbook/Guidelines/Standards and this is complemented by a number of Codes of Practice which we have and others are being reviewed and/or revised. These relate to how we will correspond with our customers, deal with requirements for billing, complaints and other matters.

We will communicate with our customers, particularly when we must temporarily interrupt services, giving advance notice in accordance with our regulatory requirements. When we have unplanned interruptions, for example as a result of burst mains or other emergency works, we will use the appropriate national, regional and local media as well as social media and mobile notifications and have a commitment to directly contact vulnerable customers.

Key targets in relation to meeting customer expectations by the end of 2025 include;
Customer Contact Handling – increase the number of customer calls answered within 20 seconds and less than 5% of calls abandoned in line with best practice in utilities.
Customer Complaint Management and/or Handling – increase the percentage of customer complaints resolved (or steps taken towards resolving the complaint) within the required timeframe of receiving the complaint from current baseline of 65% to 90% by the end of 2022, 98% by end 2025 and maintain this rate.

Objective 2: Improve operational efficiency and productivity
“Ensure a Safe and Reliable Water Supply for our population”

Our aims under this objective are to:

- **Manage the sustainability and quality of drinking water from source to tap to protect human health.**
- **Manage the availability, sustainability and reliability of water supply now and into the future.**
- **Manage water supplies in an efficient and economic fashion.**

Safe and reliable water supplies are essential to public health, including social and economic growth. GWI currently operates 28 water treatment plants and more than 250 wells across the country. Water quality from some of the water treatment plants does not meet 100% of the WHO's Standards “current Potable Water Quality Guidelines” mainly due to elevated iron levels or exceedances of other water quality parameters. A few of these treatment plants take their water from surface water sources which are vulnerable to contamination and the impacts of climate change. The water supply distribution networks operate as isolated systems which are not interconnected. It's also estimated that, nationally, we are losing approximately 65% of the water we treat due to leakage from our water mains and within customers' properties. Some of our older water mains are made from asbestos which can in itself contribute to contamination of water by dissolving into the water, particularly at times of high-flow.

GWI has identified a set of actions to address the above challenges which include to:

- Prepare and implement **Potable Water Safety Plans** to protect our water supplies in accordance with international best practice, eliminating Boil Water Notices other than from short-term extreme events.
- Manage all our **water abstractions** to minimise their impact on the environment “*aquifer management and monitoring*”.
- Implement **water conservation strategies** to reduce leakage from our water mains in the medium-term.
- Adopt an **asset management approach** to maintenance and investment in our infrastructure and equipment so that we maximise the lifespan of our assets for consistent levels of service at least cost, utilising the capabilities and systems established in Water Utilities regionally and internationally.

Key targets in relation to ensuring a safe and reliable water supply by the end of 2025 include; **Water Microbiological Standards** – increase the percentage of samples complying with WHO's water quality standards from the current baseline of 94%¹² to 99.99% by the end of 2024 and maintain that compliance rate.

Leakage of Treated Water – reduce the current leakage rate of approximately 69% to less than 55% by the end of 2025 and to an economic level of leakage “NRW” by 2030.

¹² Baseline 2019, water microbiological standard achievement rate.

Objective 3: Achieving UN-SDGs Goal 6 by 2030 “Support Social and Economic Growth”

Our aims under this objective are to:

- **Support national, regional and local economic and spatial planning policy.**
- **Facilitate growth in line with national and regional economic and spatial planning policy.**
- **Ensure that water services are provided in a timely and cost effective manner.**

The World Bank has projected Guyana population growth forecast of 2.1% at a national scale to 2025-2030. The delivery of appropriate infrastructure to meet the required demand, where and when it is needed, including support the social and economic growth of the Country. Reliable, high quality water supplies are increasingly important to attract foreign direct investment into Guyana. To achieve these objectives we must assess the demands for water services, based on national and regional spatial planning policies and plans (e.g. housing development), together with population and economic growth predictions. Our plans must ensure continuous service to all existing customers, whilst providing additional capacity to meet future population growth and industrial development. The objectives of the Government’s strategic approach to housing identified in Construction 2020 must be provided for in terms of both treatment and network capacity.

However, there are a number of challenges in meeting this objective including the accurate prediction of the growth of the domestic population and changing demography. The demand from businesses and industry is uncertain and industrial development can have significant “one-off” demands for large water and/or wastewater capacity. This requires that our plans and implementation programmes are versatile and capable of being phased as far as possible to meet emerging needs.

To meet this strategic objective we will in summary:

- **Work with national, regional and local planning bodies to ensure that we understand and plan for future development consistent with national, regional and local planning policy.**
- **Maximise the capacity of our existing assets** through effective management.
- **Invest in interconnection of networks and additional capacity** and ensure that the utility **maintain appropriate headroom** (spare capacity above demand) to cater for production risk and provide flexibility in capacity to meet new demands.
- **Balance investment for growth in demand with other priorities** to ensure best outcome for customers and the wider populace.

Objective 4: Improve financial viability and sustainability “Invest in Our Future”

Our aims under this objective are to:

- **Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality, secure and sustainable service at lowest possible cost.**
- **Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.**
- **Establish a sustainable funding model to ensure that the Utility can have access to the required capital in order to achieve the required outcomes.**
- **Promote research and utilise proven, innovative technical solutions to meet standards set by million our regulators including our objectives for cost and energy efficiency.**

approach in line with international best practice.

- **Develop a sustainable funding model with the support of government through the national budget mechanism.** GWI is taking at 5 year perspective in relation to capital investment in water services infrastructure.
- Engage collaboratively with our customers, stakeholders and our regulator (PUC) to deliver optimum investment outcomes at least cost using **clear and transparent investment criteria.**
- Raise **public and stakeholder awareness** of the value of water services and the requirements to deliver them to the required standards.
- Engage with organisations conducting **research and development** in water services, including other utilities, universities and institutes, and use proven innovation to maximise benefits for our customers and the environment.

The slow pace of investment in water and wastewater networks and treatment facilities means that we now need to secure significantly increased levels of funding approx. GY\$7.870 billion (or US\$36.606 million) each year in order to achieve adequate standards and increased coverage of potable water, including wastewater compliance to support the growth of the Country. Because of the very high levels of investment required and also the constraints on Government borrowing, the utility funding model must enable us to raise finance from other sources. For GWI to be able to raise significant finance at favourable interest rates, it will be necessary for it to demonstrate that it is an efficient water utility company, operating within a stable regulatory framework, with secure revenue streams. We need to achieve a sustainable balance between the level of investment meeting customer standard, protecting the environment and supporting the social and economic development of the country through working with our regulator (PUC) and stakeholders. This will require that we operate efficient systems and processes in both operations and capital delivery.

Our actions for achieving this strategic objective are to:

- Overcome the deficit in **knowledge of our current asset base** through the development of accurate databases linked to Geographical Information Systems (GIS) and installing modern asset monitoring and reporting systems to support automation and process control.
- Maintain our infrastructure and plan for its replacement through adopting an **asset management**

A key target in relation to investing in our future to the end of 2025 includes;

Operational and capital efficiency – meet 95% of the capital requirements identified with respect to operational and capital efficiency by end of 2025 and maintain this percentage.

Chapter 6: Financing the New Plan

6.1 A Brief Review of the Investment Programme, 2017-2019

GWl’s Strategic Plan, 2017-2021 projected improvements in service delivery based on two key pillars: (i) 90% metering of customers to minimise the inequity in revenue collection between metered and unmetered customers; and (ii) increase infrastructure “CAPITAL” investment. The plan was developed within the context of the Sustainable Development Goals (*Goal 6: Ensure access to water and sanitation for all “THE 2030 AGENDA”*), including the Government of Guyana priority of equity in access for both the hinterland and coastal populations. See summary of planned financing for the strategic period 2017-21 below.

Table 5: Planned Expenditure, 2017-21 (GY\$bln)¹³

Program Name	Planned funding budget	
	Total	source estimate
Coastal - GoG	\$4.918	
Urban - GoG	\$2.414	
Hinterland- GoG	\$2.144	
Linden - GoG	\$1.354	GoG \$10.830
WSSIIP - idb/eu	\$7.112	iadb/eu \$7.112
WSIP- CDB	\$3.570	cdb/ukcif \$3.570
On-going Financing	\$21.512	total \$21.512
Financing Gap	\$12.797	unfunded \$12.797
Total Financing	\$34.308	Gr.total \$34.308

The plan estimated Central Government financing of GY\$10.830 billion, and development partners some GY\$10.68 billion, totaling in excess of GY\$21.5 billion in financial resources. However, the aggregate cost of the plan was GY\$34.3 billion. However, the Plan was developed with a funding gap of GY\$12.797 billion. This gap impacted key performance indicators in the programmatic areas of: (i) Water Production and Quality, (ii) Water

Distribution, (iii) Sanitation and Sewerage, and (iv) Finance and Customer Services, and by extension the achievement of the objectives of the Plan. As at the end of 2019, a total of GY\$8.142 billion was expended on capital investment that represents 80% of the sum that was projected to increase access, improve water quality, and supply and distribution infrastructure for the period 2017-19. With GY\$4.749 billion being local funds and GY\$6.413 billion financed by development partners “specifically, the IDB/EU Program: WSSIIP”. See summary of expenditure by funding source for the period 2017-19 in table 3 below.

Table 6: Summary of Capital Expenditure, 2017-19

Fiscal Year	Funding Source		Grand Total	percentage change (%)		
	Foreign	GoG		Foreign	GoG	Total
2017	\$1,380.000	\$1,150.000	\$2,530.000	122.6%	-7.0%	36.3%
2018	\$2,200.000	\$528.000	\$2,728.000	59.4%	-54.1%	7.8%
2019	\$1,600.000	\$1,284.000	\$2,884.000	-27.3%	143.2%	5.7%
Total	\$5,180.000	\$2,962.000	\$8,142.000	\$10,856		

Percapita expenditure of the three yrs GY\$10,856

¹³ Revised Planned Expenditure, 2017-21.

6.2 The Strategic Investment Programme (SIP) 2021-2025

For the new strategic cycle, the utility has already advanced project concepts and engaged in dialogue with central government and development partners to ensure that the residents of Guyana are provided with the needed improvements in the potable water sector. Such as increase **treated water coverage to 90% [baseline of 53%, end 2019]** and increase access. The strategic investment programme envisaged to achieve the targets set out in the New Strategic Plan and by extension advancing the Government's mission towards achieving the United Nations, SDGs Goal 6: Ensure access to water and sanitation for all will be financed substantially by Central Government and International Development Assistance (IDA). The overall capital investment required for the next five (5) years is estimated at **GY\$42.536 billion (or US\$197.841 million)**. These investments are projected to improve water quality and the quality of life for over 280 thousand persons including women and children, and other vulnerable groups in society.

Table 7: Summary of Strategic Investment Programme, 2021-025

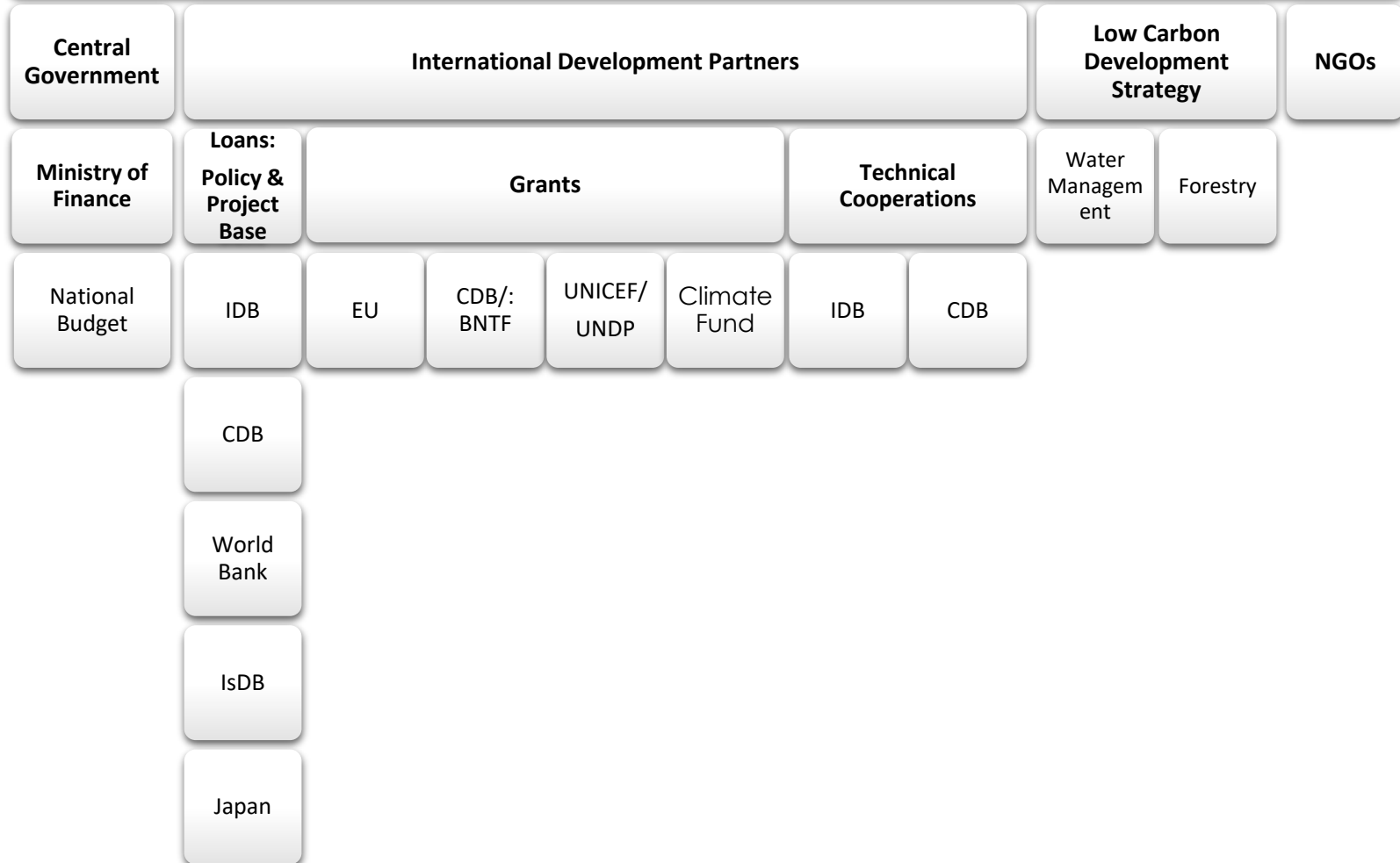
Strategic Investment Areas/year	1 2021	2 2022	3 2023	4 2024	5 2025	Total US\$Mn	Total G\$Bln	% share
Water Treatment Facilities	\$8.81	\$18.360	\$25.70	\$14.688	\$5.875	\$73.440	\$15,790	37.1%
Non-Revenue Water	\$4.407	\$9.182	\$11.018	\$9.182	\$2.938	\$36.726	\$7,896	18.6%
(i) network	\$2.068	\$4.308	\$5.169	\$4.308	\$1.378	\$17.230	\$3,704	8.7%
(ii) metering	\$2.340	\$4.874	\$5.849	\$4.874	\$1.560	\$19.496	\$4,192	9.9%
Unserved Areas/Access (incl. NHS)	\$0.990	\$2.063	\$2.475	\$2.063	\$0.660	\$8.250	\$1,774	4.2%
Georgetown Network Upgrade	\$4.488	\$9.350	\$11.220	\$9.350	\$2.992	\$37.400	\$8,041	18.9%
Wastewater Treatment Facility	\$4.800	\$10.000	\$12.000	\$10.000	\$3.200	\$40.000	\$8,600	20.2%
ICT/Business Administration	\$0.243	\$0.506	\$0.608	\$0.506	\$0.162	\$2.025	\$435	1.0%
Total/p.a (US\$Mn)	\$23.741	\$49.460	\$63.024	\$45.788	\$15.827	\$197.841	\$42,536	100%
Total/p.a (GY\$Bln)	\$5,104	\$10,634	\$13,550	\$9,844	\$3,403	\$42,536		
percapita cost (GY\$thous)	\$6,819	\$14,207	\$18,103	\$13,152	\$4,546	\$56,827		
disbursement projection (%)	12%	25%	30%	25%	8%	100%		
Strategic Programmatic Areas	est. cost	% share	description					
WPD&E	\$136.320	68.90%	Water Production, Distribution, & Quality					
SAN/WwT	\$40.000	20.22%	Sanitation/Wastewater Treatment					
F&C	\$19.496	9.85%	Finance and Customer Services					
O&M	\$2.025	1.02%	Organisation and Management					
Total	\$197.841	100.00%						

See details of the overall strategic programme plans by programmatic area and total financing, 2021-025 on pgs. 33-34.

Note**

The key areas identified for strategic investment includes: (i) water treatment and distribution, (ii) Non-Revenue Water, (iii) Unserved Areas/Access, (iv) Wastewater Treatment Facility, (v) Georgetown Network Upgrade, and (vi) ICT/Business Demand Management.

Financing Modalities 2021-2025



Development Partners identified for the financing of Strategic Interventions, 2021-2025

Table 8: Summary of Strategic Initiatives to Increase Treated Water Coverage and Wastewater Treatment, 2021-2025

Region	Treatment System	Provisional cost estimate (US\$)			Service connections (US\$)	Metering and NRW (US\$)	Total Estimated Cost (US\$)	Source of Funding
		new treatment facilities	transmission /distribution system	upgrade of treatment facilities				
Region 2	New 4MLD Treatment Plant at Charity	\$3.540	\$1.600		\$0.173	\$0.690	\$6.003	CDB
	New 5MLD Treatment Plant at Onderneeming)	\$5.000	\$2.700		\$0.193	\$1.386	\$9.279	Unfunded
Region 3	New 2MLD Treatment Plant at Leguan and 2MLD treatment plant at Wakenaam	\$4.000	\$0.320		\$0.208	\$0.600	\$5.128	CDB
	New Treatment Facilities (inclusive of 1- 12MLD plant at Parafaith Harmony and 1- 8MLD plants at Wales, inline filters at Best and Parika Backdam)	\$14.500	\$3.200		\$0.737	\$3.726	\$25.163	Unfunded
	Treatment Plant Upgrade at Vergenoegen W.T.P			\$1.000				
	Treatment Plant Upgrade at Poudroyen and Fellowship			\$2.000				
Region 4: East Coast Demerara	Treatment Plant Upgrade at Mon Repos, Betterhope and Friendship W.T.P.s (activate well at Better Hope, drill well at Mon Repos and Lusignan, activate elevated storage at Annandale) 24" HDPE Transmission link from Friendship WTP to Railway		\$0.600	\$4.300	\$1.074	\$2.709	\$19.433	Unfunded
	New Treatment Facilities (inclusive of 6- inline filtration systems (Helena, Clonbrook, Hope Lowlands, L.B.I, Sparendaam and Annandale and 1- 12MLD plant at Bachelor Adventure)	\$10.000	\$0.750					
	Region 4 East Bank Demerara	Water Treatment Plant Upgrade at Eccles, Covent Garden and Grove			\$4.500	\$0.208	\$2.300	\$15.289
Region 4: GTN	New Treatment Facility (1- 8MLD plant at Caledonia)	\$6.000	\$2.280					
	Transmission & Distribution Lines Upgrades		\$32.400		\$5.000		\$37.400	Unfunded
Region 5	30 MLD Wastewater Treatment Facility (for Central Georgetown, festival city, Guyhoc Park, La Penitance and Kitty) Extension of sewerage collection network to 3000 properties and kitty.	\$30.000	\$10.000				\$40.000	Unfunded
	New 8MLD treatment plant at Bushlot	\$6.500	\$1.200		\$0.747	\$1.080	\$9.527	CDB
	New Treatment Facilities (inclusive of 1- 3MLD plant at Weldaad and 1- 2MLD plant Ithaca, inline filter at Dehoop, Farm)	\$1.800	\$2.100		\$0.165	\$0.882	\$5.947	Unfunded
Treatment Plant Upgrade at Cotton Tree			\$1.000					
Region 6	New 8MLD Treatment Plant at Letter Kenny	\$6.500	\$1.100		\$0.481	\$1.065	\$9.146	CDB
	Treatment Plant Upgrade at Port Mourant			\$2.000	\$0.319	\$0.752	\$5.251	Unfunded
	New treatment facilities (inline filters at Yakasuri and Mibicuri)	\$0.800	\$1.380					
Total Financing Required		\$88.640	\$59.630	\$14.800	\$9.305	\$15.191	\$187.566	
1. CDB Support (will take us to 62% treated coverage, curr 52%)		\$20.540	\$4.220	--	\$1.609	\$3.435	\$29.804	
2. Gap funding required for 90% treated water cov. (excl. CDB)		\$38.100	\$13.010	\$12.800	\$2.377	\$11.003	\$80.362	
3. Total Funding Gap (inclusive GT Network Upgrade & WwTF)		\$68.100	\$55.410	\$14.800	\$7.696	\$11.756	\$157.762	
4. %share CDB funding for treated water coverage		35%	24%	--	40%	24%	27%	
5. %share of funding gap for 90% treated water coverage		65%	76%	100%	60%	76%	73%	

6.3 Summary of Strategic Interventions for Financing, 2021-2025

6.3.1 Programmatic Area: Organisation and Management

A sum of **GY\$435 million (US\$2.025 million or 1.02%)** of the strategic investment programme is projected to be expended within the plan cycle to address challenges in the Organisation and Management of the Utility in a coherent and comprehensive manner. ICT Infrastructure expansion, and maintaining cyber security programmes are expected. In addition, the replacement of both our major financial information systems (Oracle EBS and the Customer Info System “HiAffinity”).

The operationalisation of the New Water Resources Database to capture all information in relation to the resources including abstraction, water quality, disruptions and maintenance information has the capacity to store all records and to conduct analysis for management and future uses. This database will feed into Aquifer study activities planned over the next ten years into the Groundwater Management Plan to be completed in 2020.

6.3.2 Programmatic Area: Water Production, Distribution, and Quality

The sum of **GY\$29.309 billion (US\$136.320 million or 68.9%)** of the strategic investment programme for the life-cycle of the Plan will be utilised to improve water quality, production and supply capacity with the regions. The Utility propose the construction of New Water Treatment Facilities in Regions 2, 3, 4-EB, 4-EC, 4-GT, 5, and 6¹⁴ along with the expansion of transmission and distributions network, including upgrades and 100% metering within the areas/zones that receives treated water in order to achievement a 90% treated water coverage and reduce Non-Revenue Water. The CDB funding will account for 27% of the required financing under this programmatic area to address treated water coverage. Under the Central Government financed capital programme, several wells will be drilled and operationalised in an effort to ensure redundancy, continuity of supply and an improved level of service within a number of zones across the country. The utility has procured drilling equipment to reinstall resident capacity for well drilling in the short-to medium-term. This initiative will reduce the cost of well drilling and will be supported by the engineers and senior technical staff within GWI that already received training in advanced well drilling techniques. GWI will also be rehabilitating and installing new distribution mains across the coastal belt and hinterland regions of Guyana in an effort to ensure service is maintained and expanded to communities and packets of our populace which has been without access to potable water for decades.

With a strong emphasis on water quality, GWI has commenced the strengthening of its water testing and 24 hours monitoring capabilities. The utility plans to fully equip a number of its mini-labs in an effort to improve their surveillance capability of the quality of water being distributed, including the monitoring of waterborne infections/diseases in collaboration with the Ministry of Health.

Water conservation will be addressed through the installation of meters on all customers receiving treated water supply. In addition, Automatic Meter reading will significantly enhance the distribution analysis and will be explored over the next four (4) years.

¹⁴ Ref: Table 8 on pg. 32 for investment initiatives to achieve 90% treated water coverage, 2021-25.

6.3.3 Programmatic Area: Wastewater Treatment and Sewerage

In the Sub-sector of Wastewater and Sewerage a sum of **GY\$8.6 billion (US\$40 million or 20.22%)** of the strategic investment programme is projected to be expended during the Plan. A portion of these resources will be for the rehabilitation and expansion of Wastewater Treatment Systems in Georgetown and New Towns. Additionally, GWI will be rehabilitating and expanding the Ruimveldt Sewerage Collection Station. Currently, approximately 15000 m³ of untreated wastewater is discharged daily into the Demerara River. US\$10 million is estimated for extending the gravity sewer network to collect septic tank effluent from Kitty, Festival City, Guyhoc Park and La Penitence area. In addition, GWI is making strides to improve its methods of disposal via the construction of a Central Georgetown Wastewater Treatment Plant (est. budget US\$30 million): A Wastewater plant treating 20,000m³/day of raw sewage the existing Central Georgetown sewage network. The cost includes training of GWI operations and management supervision for 1-year O&M. In addition to the expansion of the sewerage system.

6.3.4 Programmatic Area: Finance and Customer Service

A sum of **GY\$4.192 billion (US\$19.496 million or 9.85%)** of the capital investment programme will be utilised in the areas of Finance and Revenue for the expansion of its revenue collection and a reduction of NRW over the plan years. This will be supported by the improvements in the Customer Information and Billing System upgrade and the procurement and installation of water meters. To this end, the utility plans to install over 70,000 meters during the implementation cycle of the new plan. In 2021, GWI planned to commence meter installation of approximately (20,000, MC/61%), 2022 (25,000, MC/73%), 2023 (20,000, MC/82%), 2024 (15,000, MC/85%). In addition, GWI will continue to install and monitor District Metering Areas (DMAs) in a number of zone that exhibits relatively low Level of Service (LOS). Given, these initiatives it is projected that the utility will increase billings, current revenue collection, and reduce customer debt accumulation.

Guyana Water Inc.

Table 10: Summary of Performance Indicators, 2021-25

Programmatic Areas	Indicator	Unit	Baseline (2019)	TARGETS				
				2021	2022	2023	2024	2025
Organisation & Management	employment expenditure	%	56	51	50	49	47	45
Organisation & Management	% of employees trained	%	72	30	30	30	30	30
Organisation & Management	productivity ratio	no.	7.1	7	6.7	6.5	6.3	6.1
Non-Revenue Water	NRW (% of input volume)	%	70	67	64	61	58	55
Non-Revenue Water	NRW (% of annual operating cost)	%	57	58	54	51	48	44
Non-Revenue Water	% of customers metered	%	53	59	67	75	82	85
Water Production	% of coastal wells monitored	%	0	22	39	56	73	91
Water Production	energy index	kWh/m3	0.29	0.27	0.25	0.22	0.21	0.20
Water Production	% of planned operating hours lost	%	0.8	0.7	0.6	0.5	0.4	0.3
Water Distribution	% of population receiving water service	%	96	97	97	98	98	99
Water Distribution	treated water coverage	%	53	60	65	70	85	90
Water Distribution	% of leakage complaints resolved	%	40	100	100	100	100	100
Water Quality	% of iron tests in compliance	%	46	50	75	90	95	95
Water Quality	% of total coliforms tests in compliance	%	90	100	100	100	100	100
Water Quality	% of e coli tests in compliance	%	98	100	100	100	100	100
Water Quality	% aesthetic parameters (colour, turbidity, pH) tests in compliance	%	86	90	90	95	100	100
Sanitation	% of sewerage related complaints resolved	%	88	100	100	100	100	100
Sanitation	station availability	%	92	100	100	100	100	100

Guyana Water Inc.

Table 10: Summary of Performance Indicators, 2021-25

Programmatic Area	Indicator	Unit	Baseline (2019)	TARGETS				
				2021	2022	2023	2024	2025
Sanitation	% of sewerage related complaints resolved	%	88	100	100	100	100	100
Sanitation	station availability	%	92	100	100	100	100	100
Finance & Customer Services	% of customers billed	%	98.8	100	100	100	100	100
Finance & Customer Services	Collections efficiency	%	40	70	75	80	85	90
Finance & Customer Services	arrears	%	75	65	60	55	50	45
Finance & Customer Services	% of customer services related complaints/requests resolved	%	36	93	95	98	99	100
Finance & Customer Services	*Operating Revenues	\$ mil	5,890.01	6,924.29	7,237.64	7,550.99	7,864.34	8,177.69
Finance & Customer Services	Operational & Maintenance (O&M)	\$ mil	-8,345.53	-7,490.35	-7,652.28	-7,817.77	-7,986.91	-8,159.77
Finance & Customer Services	EBITDA	\$ mil	-947.39	-566.07	-414.64	-266.78	-122.57	17.91
Finance & Customer Services	Net Profit/(Loss)	\$ mil	-2,918.56	-951.48	-858.59	-795.80	-740.32	-692.40
Finance & Customer Services	EBITDA	%	-13	-8	-6	-4	-2	0
Finance & Customer Services	Net Profit/(Loss)	%	-39	-11	-10	-9	-8	-7

Chapter 7: Description of Indicators

Table 11: Description of Indicators

Indicators	Description
employment expenditure	proportion of sales (billings) expended on payroll
percentage of employees trained	proportion of total employees who have received training within the year
productivity ratio (<i>index</i>)	ratio of total staff to per 1000 customers
NRW (% of input volume)	Volume of Non-Revenue Water expressed as a proportion of total System Input Volume
NRW (% of annual operating cost)	Value of Non-Revenue Water expressed as a proportion of Annual Operating Cost
% of customers metered	proportion to total customers who are billed on a metered tariff
cumulative percentage of coastal wells monitored	cumulative percentage of coastal wells monitored for specific capacity of well drawdown, for consistency and or improvement
energy index	Energy required to deliver one cubic meter of water to customers (KWh/m ³)
% of planned operating hours lost	percentage of planned operating hours lost due to internal system downtime
proportion of population receiving water service	proportion of population whose water service is being provided/supported by GWI
treated water coverage	percentage of customers served by Water Treatment Plants
percentage of operational complaints/requests resolved	percentage of operational complaints/requests resolved with the requisite timeframe
iron content testing	proportion of iron tests carried in the distribution that confirm to standard (< 0.3mg/l)
total coliforms testing	proportion of total coli form tests carried in the distribution that confirm to standard
e-coli testing	proportion of e coli tests carried out in the distribution that confirm to standard
% aesthetic parameters passed (colour, turbidity, pH)	proportion of turbidity, pH, apparent colour carried out in the distribution that confirm to standard
complaints resolved	proportion of sewerage related complaints that were resolved within the requisite timeframe
station availability	proportion of sewerage stations available more than 28 days of the month
customers billed	proportion of total customers billed
Collections efficiency	proportion of annual billings collected within the year

Indicators	Description
arrearage	proportion of accounts receivables over 90 days
percentage of customer services complaints/requests resolved within requisite timeframe	percentage of customer services complaints/requests resolved with requisite timeframe
*Total Income	Total Income (Tariff & Other Income) inclusive of GoG electricity subvention
EBITDA	Earnings before Interest, Tax, Depreciation and Amortisation
EBT	Earning before Tax
EBITDA	Earnings before Interest, Tax, Depreciation and Amortisation/Total Income
Net Profit/(Loss)	Total Income Less Total Operating Cost
Net Profit/(Loss)	Total Income Less Total Operating Cost /Total Income

Table 12: Programmatic Areas and Indicators Assumption

Programmatic area	Indicator	Assumptions	Notes
Organisation & Management	employment expenditure	Decrease in staff count/allowances paid Increase in income	Income used as denominator as opposed to Collections
Organisation & Management	% of employees trained		Baseline year 2019 saw special training arrangements that resulted in an unprecedented number of staff trained in single year. Training to be more streamlined in accordance with staff needs.
Organisation & Management	productivity ratio	Decrease in staff count Customer count increases by 20,000	
Non-Revenue Water	NRW (% of input volume)	Dependent on financial investments for metering, DMA management	Targets accepted by PUC
Non-Revenue Water	NRW (% of annual operating cost)	Dependent on financial investments for metering, DMA management	Based on the Operating cost for m3 of water.
Non-Revenue Water	% of customers metered	Dependent on financial investment	Aims to install 15,000 meters per year throughout plan period.
Water Production	% of coastal wells monitored		
Water Production	energy index		
Water Production	% of planned operating hours lost		Final target assumes that all systems are on 24-hrs supply and that internal downtime is due to only maintenance works
Water Distribution	% of population receiving water service	Dependent on financial investments (wells, other supply systems)	
Water Distribution	treated water coverage	Dependent on financial investments (WTPs, pipelines, other treatment systems)	

Programmatic area	Indicator	Assumptions	Notes
Water Quality	% of iron tests in compliance	Dependent on financial investment (iron removal WTPs)	Baseline value is at August 2020
Water Quality	% of total coliforms tests in compliance		Baseline value is at August 2020
Water Quality	% of e coli tests in compliance		Baseline value is at August 2020
Water Quality	% aesthetic parameters (colour, turbidity, pH) tests in compliance		Baseline value is at August 2020
Sanitation	% of sewerage related complaints resolved		
Sanitation	station availability		
Finance & Customer Services	% of customers billed		
Finance & Customer Services	Collections efficiency		
Finance & Customer Services	arrearage		
Finance & Customer Services	% of customer services related complaints/requests resolved		Process to deal with customer complaints/query recently revised to better track the complaints recorded for resolution within timeframe.
Finance & Customer Services	Operating Revenues		Operating Revenues do not include GoG subvention and deferred income
Finance & Customer Services	Operational & Maintenance (O&M)		
Finance & Customer Services	EBITDA		
Finance & Customer Services	Net Profit/(Loss)	GoG subvention & deferred income is included in Total income	
Finance & Customer Services	EBITDA		
Finance & Customer Services	Net Profit/(Loss)		

