

Gender Assessment

FP060: Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados)

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WATER SECTOR RESILIENCE NEXUS FOR SUSTAINABILITY IN
BARBADOS (WSRN S-BARBADOS)

Gender Action Plan

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**Gender Analysis for a Water Sector Resilience Nexus for Sustainability
in Barbados**

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Executive Summary

This Gender Analysis was conducted for the proposed project formerly named, “Energy-Water-Nutrients Nexus for Sustainable Coastal Infrastructure (EWN-SCI) in Barbados,” and now renamed “Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados),” during the period August 8 – November 18, 2016. Gender issues relevant for water and wastewater management were identified, and project partners’ (Barbados Water Authority (BWA), University of the West Indies (UWI), University of South Florida (USF)) institutional capacities to meaningfully integrate gender considerations were assessed. Subsequent to the submission of this report, and based on feedback from the EWN-SCI stakeholder and gender analysis, the EWN-SCI project goals were adjusted to reflect stakeholder priorities leading to the expanded, and shifted scope of the WSRN S-Barbados Project.

The overall goal of the EWN-SCI in Barbados was to reduce the greenhouse gases emission intensity for water provision by: (i) integrating photovoltaic renewable energy production at the water supply facilities, (ii) designing and implementing sustainable Water Loss Reduction initiatives, and (iii) developing a trans-disciplinary education, training, and entrepreneurship network for climate resilient water-energy utilities in the Caribbean that facilitate adaptation to Climate Change. In addition to these expected EWN-SCI outcomes, the WSRN S-Barbados expanded scope also includes creation of a revolving climate adaptation and mitigation fund to pursue projects identified as priorities in the Climate Change Adaptation Water Master Plan, which is to be developed as part of WSRN project. Analysis specific to this latter outcome is therefore not included in this report but will be addressed during project implementation.

The gender analysis of the EWN-SCI project was conducted with the aim of identifying gender considerations and devising ways of streamlining gender equality in the project proposal. This analysis is intended to (i) provide an overview of existing national policies, strategies and action plans that elaborate on the importance of integrating gender perspectives into national Climate Change adaptation strategies related to water management and infrastructure in Barbados, (ii) develop an understanding of the project partners institutional capacity to meaningfully integrate gender considerations into the final project to align with best local, regional and international gender policies and practices, (iii) identify gender issues relevant for water management highlighting the socio-political, economic and cultural aspects of Climate Change adaptation and mitigation, and (iv) provide recommendations on how to mainstream gender in the proposal, and include specific tasks and activities designed to build capacity at the UWI Institute for Gender and Development Studies. It is anticipated that identification of these gender issues will highlight potential gaps in the EWN-SCI project goals that represent missed opportunities to align with stakeholder priorities, and that reinforce existing climate resiliency disparities. Project goals are expected to be adjusted to address these disparities and expand the potential project benefits.

Government of Barbados’ demographic and gender statistics, national climate change and gender policies, Caribbean literature on gender, climate change and water infrastructure projects, and social media commentary on the quality of water services received from the Barbados Water Authority were reviewed to gain cultural context, and community insight on

existing gender inequalities. Focus groups and interviews with project partners, key agency and business sector personnel were also conducted to identify issues with the management of water and wastewater resources.

There are currently no legislative commitments to gender equality in water and wastewater resources management in Barbados. A Draft National Policy on Gender is presently before parliament but the policy does not address gender and water. The University of the West Indies Institute for Gender and Development Studies (IGDS), Cave Hill Unit recognizes the importance of gender and infrastructure and is keen on building capacity in this area. The BWA has more men than women employed in technical (45% vs 3.5%), and leadership (9.1% vs 3.9%) roles which directly contribute to the design and management of the utility's projects. Most of these individuals are in the middle or near the end of their careers (> 40 years of age), and thus present a timely opportunity to recruit, train and promote women to fill these roles. On social media (Facebook and Twitter), many individuals criticized the lack of communication from the BWA during the water shortages. The lack of an online presence by the BWA represents a lost opportunity to engage its stakeholders on collaborative solutions to improved services.

Literature and tools for categorization of the gender dimension of water and wastewater infrastructure projects to determine the scope, and type of gender mainstreaming activities required are limited. The UWI IGDS, Cave Hill Unit has the opportunity to build capacity in this area by leveraging expertise from the Mona Unit and Barbados Bureau of Gender Affairs. The concept of gender integration was particularly new to many of the focus group members. Organizational members could benefit from gender training that includes roles of focal points, gender sensitive budgeting and gender competency. The water user survey revealed a statistical significant association ($p \leq 0.05$) between gender and type of water storage container used at the household level. Men were more likely than women to report use of larger tanks, while women showed a preference for smaller containers. Identification and consideration of design parameters will facilitate or limit the successful adoption or adaptation of rainwater harvesting systems. The proposition of a research arm of the utility that could study gender dimensions of health impacts of water quality and water interruptions, and economic studies assessing feasibility of introducing a tariff structure on water provision were priority projects from the BWA. Investment in equipment at the national government lab, and at the University of the West Indies (UWI) Chemistry Department represents a skills building and economic empowerment opportunity for women who form the bulk of workforce at these institutions.

The key recommendation identified from the Gender Impact Assessment for the EWN-SCI Projects are: 1) identify clear gender objectives and targets prior to project implementation to ensure their incorporation in the project, 2) allocate budget to appoint a gender focal point who would coordinate these activities, 3) target training and recruitment for jobs that will be rewarded through this project to increase representation of the under-represented sex for each position, 4) include socio-economic information as a criterion for prioritization of locations for project interventions, 5) include socio-economic information as a criterion for prioritization of locations for project interventions.

1. Introduction

Climate change and its impacts are not gender-neutral. Infrastructure projects developed to mitigate and or adapt to climate change impacts, will have different degrees of gender dimensions, based on the social and economic contexts within which populations are embedded. **Gender** is a socially constructed concept and refers to the roles assigned and opportunities ascribed to men and women, within a specific cultural context, and at a particular point in time on the basis of their sex (Hannan 2001, Dunn 2012). Since gender roles are socially constructed and not biologically determined, they can be changed. This change may be desired and it can lead to gender equality.

Gender equality is defined as the creation of equal rights, power and opportunities for women and men by allowing them to contribute on an even footing economically, politically, socially and culturally (UNFCC 2015, UNIDO 2014). It entails that society values the roles played by men and women equally. **Gender equity** leads to equality and is the process by which men and women are treated fairly. This often includes proactively compensating for disparity in historical and social disadvantages that otherwise reinforce the inequitable basis on which women and men operate.

The ultimate goal of **gender mainstreaming** is to transform unequal social and institutional structures into equal and just structures for both men and women (Dunn 2012). This requires the full participation of both groups (especially women) in the planning stage of projects particularly at the community level. Gender mainstreaming is achieved by pursuing actions that lead to gender equality and gender equity. Gender analysis is a useful tool to identify points of intervention in the project cycle at which existing or potential disparities can be compensated for/reduced or eliminated.

Incorporating gender differences in climate projects is smart economics, and as such the Green Climate Fund (GCF) is the first international fund to mandate the integration of a “gender-sensitive approach” throughout project life cycles. Projects that systematically address, rather than reinforce gender inequalities that increase the vulnerability of specific groups to climate change will provide greatest benefits and be most effective.

This report provides a gender analysis of a Proposed Project on Energy-Water-Nutrients Nexus for Sustainable Coastal Infrastructure (EWN-SCI) in Barbados. It concludes with recommendations on approaches to mainstream and operationalize gender throughout the life cycle of the project.

The proposed Food-Energy-Water water sector infrastructure project has overall goals to:

1. Reduce the greenhouse emission intensity and the energy bill of water provision by integrating photovoltaic renewable energy production at the water supply facilities.
2. Reduce the greenhouse emission intensity of water provision by designing and implementing sustainable Water Loss Reduction (WLR) initiatives.

3. Reduce the greenhouse emission intensity of water provision and make local use of embedded resources found in wastewater by demonstrating the use of reclaimed wastewater in agriculture, to safely and efficiently recover valuable resources from wastewater effluents and sludge.
4. Develop a transdisciplinary education, training, and entrepreneurship network for climate resilient water-energy-nutrient efficient resource recovery utilities in the Caribbean that mitigate greenhouse gas emissions and improve adaptation to climate change.

2. Goals and Objectives

This Gender Analysis was commissioned by the Caribbean Community Climate Change Center (5Cs), to form part of the proposal entitled “Energy-Water-Nutrients Nexus for Sustainable Coastal Infrastructure Barbados,” which is to be submitted to the Green Climate Fund (GCF). This proposal is designed to develop an interdisciplinary program in Barbados that implements demonstration sites with integrated water supply and efficient energy management systems that are designed to mitigate greenhouse gas emissions, support climate change adaptation strategies, build technical capacity in the Caribbean region and share lessons learnt with the rest of the CARICOM countries. This gender analysis is intended to:

- Provide an overview of existing national policies, strategies and action plans that elaborate on the importance of integrating gender perspectives into national climate change adaptation strategies related to water and wastewater infrastructure in Barbados
- Develop an understanding of the project partners institutional capacity to meaningfully integrate gender considerations into the final project to align with best local, regional and international gender policies and practices
- Identify gender issues relevant for water and wastewater management highlighting the socio-political, economic and cultural aspects of climate change adaptation and mitigation. It is anticipated that identification of these issues will highlight potential gaps in the projects goals that do not align with stakeholder priorities, and that reinforce existing disparities. Project goals can be adjusted to address these disparities and expand the potential project benefits
- Provide recommendations on how to mainstream gender in the proposal, and include specific tasks and activities designed to build capacity at the UWI Institute for Gender Studies so that they can address climate change and resiliency in the water resources management in the future

3. Study Methodology

3.1 Study Methodology Activities

The following activities were undertaken as part of the gender analysis:

- Review of Government of Barbados’ population and economic statistics, national gender policies and assessments to develop a comprehensive description of the socio-economic environment and national commitment to gender equality in Barbados.

- Review of region specific literature exploring the relationships between gender, climate change and appropriateness of water projects/initiatives proposed, as well as social media commentary on the quality of services received by customers of the Barbados Water Authority to gain cultural context and community insight on existing gender inequalities and impacts resulting from the types of water infrastructure projects pursued and their methods of implementation
- Conduct of focus Groups with Project Partners, and Key Agency and Business Sectors, and interviews to identify issues with the management of water and wastewater resources, and opportunities to maximize use of these resources with a goal of building climate resiliency
- Execution of a water user survey to determine gendered differences in social, economic and health concerns related to water use, treatment and infrastructure projects pursued to alleviate existing challenges and build sector resiliency

Details on the survey of social media platforms, focus group, key informant interviews and water user survey are described in the following sections.

3.1.1 Survey of Social Media Platforms

The social media platforms of Facebook and Twitter were surveyed for general population views and perceptions on the quality of services provided to the public by the BWA. Key phrases like #barbadoswater, #barbadoswaterauthority and #barbadoswatercrisis were trending on these platforms. Upon inspection of the posts associated with these phrases, the news articles and/or exchange of comments provided context on the issues related to water provision and opportunities for improvement of this service. In this review two parishes – St. John and St. Joseph were highlighted as areas of special concern due to extended and frequent water interruptions. Section 3.1.4 summarizes key gender concerns identified in these two areas.

3.1.2 Focus Groups

Semi-structured focus groups were conducted with management level project team members and groups of individuals listed in Table 1. For the BWA focus group an effort was made to maintain a 50:50 gender representation. Questions posed to the group solicited feedback on strategies that could be taken to increase climate resiliency of the utility, clarify knowledge gaps on the rationale for incorporation of gender perspectives/considerations in development of water infrastructure projects, and identify opportunities to improve the gender equity in distribution of benefits of proposed activities.

Each focus group was facilitated by the researchers in a convenient, non-threatening location (i.e. public community centers, business places). The researchers encouraged open and free discussion relevant to the themes, but also allowed the conversations to organically evolve in an effort to glean nuanced perspectives from the group. Finally, notes were taken during the process and summarized by the consultants to contribute to the context of the assessment and to add to recommendations for the utility.

Table 1. List of organizations, departments and representative sectors for the focus groups

Representative Sector & # People	Organization's Name and Department
Public Utility (12)	Barbados Water Authority <ul style="list-style-type: none"> ➤ Pipes Replacement Project Manager ➤ Water Quality Technician ➤ Safety and Health Officer ➤ Financial Controller ➤ General Manager of Utility ➤ Customer Service Supervisor ➤ Administrative Assistant ➤ Utility Board Members
Academia (4)	University of the West Indies <ul style="list-style-type: none"> ➤ Institute for Gender & Development Studies

3.1.3 Interviews

Interviews were held during the period October 20 – November 7, 2016 with representatives from key water and gender related agencies, and business sectors to discuss issues related to management of water, and wastewater resources across the island. Interviews ranged between 30 minutes and 2 hours. The interviews were anonymized and used to provide baseline data to broadly categorize the perspectives of the range of stakeholders.

Interviewees listed in Table 2 were identified based on their real or perceived (expert knowledge on feasible and priority water sector projects) and or roles as major influencers in the implementation of development projects that build climate resiliency. Lastly perspectives on existence of gender issues/considerations for the implementation of the EWN-SCI and other proposed activities were explored. The information gathered was used to provide sector and context-specific recommendations about the portfolio of climate resilient projects the BWA can pursue, as well as potential partnerships that should be forged for successful project implementation.

3.1.4 Water User Survey

The survey tool was developed to gather primary data at the resident level from all eleven parishes in Barbados. Budgetary and time constraints rendered an island-wide survey to be unfeasible resulting in the selection of a representative cross-section that would provide for a meaningful survey. The total number of respondents surveyed was 229. A minimum of 205 respondents were needed to allow for reporting of statistics at a 95% confidence interval and a +/- 7 confidence level. A stratified population sample was gathered from each parish using the 2010 Population and Housing Census statistics as the population reference (BSS, 2010). Efforts were made to maintain a 50:50 gender representation in the sample.

Permission for this study was granted by Institutional Review Board (IRB) at the University of South Florida under study #Pro00027337. The IRB approval process ensures that the survey and study protocols are ethically developed and it requires the research team to inform potential

participants of the purpose and use of the information, explains the questions in a non-coercive way, and enrolls only willing individuals.

Table 2. Organizational affiliations, titles, and representative sectors of stakeholder interviews

Organizational Affiliation	Title	Representative Sector
Altman Realty	Executive Director	➤ Private ➤ Business, Housing Infrastructure
Barbados Water Authority	Customer Service Director	➤ Public Utility
Barbados Water Authority	Financial Controller	➤ Public Utility
Barbados Water Authority	Health and Safety Officer, Human Resource Manager	➤ Public Utility
Barbados Water Authority	Mechanical Engineer for Pumping/Reservoirs	➤ Public Utility
Caribbean Development Bank	Senior Operations Officer	➤ Development Agency
Caribbean Hotel Energy Efficiency Action Program	Director	➤ Tourism ➤ Energy
Caribbean Water and Wastewater Association	Utility CEOs, Government Ministers, Engineers and Technicians	➤ Public Utility ➤ Private Companies
Innotech	Facilities Manager for BWA Building	➤ Business Infrastructure
Environmental Protection Department	Director	➤ Regulation
RENTech	Executive Director	➤ Private ➤ Energy
Retired	Farm Owner	➤ Entrepreneur ➤ Agriculture
SIR Water Management Limited	Managing Director	➤ Entrepreneur ➤ Wastewater
Stantec Engineering Consulting Firm	Senior Engineering Consultant	➤ Private ➤ Wastewater ➤ Business, Infrastructure
Torque Engineering Procurement and Construction Management	Managing Director and Mechanical Engineer	➤ Entrepreneur
University of the West Indies- Chemistry Department	Faculty	➤ Education
University of the West Indies- Management Studies Department	Faculty and BWA Board Member	➤ Education ➤ Public Utility

The survey tool was developed in collaboration with the core team to formulate and validate the questions and potential responses. The instrument captured baseline gendered differences in survey responses on questions addressing issues of satisfaction with quality of water services received, as well as perceptions of power and agency in decision-making related to water sector projects. This sex disaggregated data provides a simultaneous picture of what information is available and indicators to be monitored, as well as the gaps which should be filled by statistics

and further research. This data can be used to predict negative or positive impacts of proposed interventions on specific populations, and used to provide recommendations for projects aimed at improving access, storage, treatment and addressing health considerations in projects implemented.

Random and referral sampling techniques were used to obtain study participants, and only Barbadians 18 years of age and older were surveyed. A list of locations where surveys were administered is available in Table 3. The survey was an anonymized 27 multiple choice or multi-select questionnaire, and responses were based on respondent experiences as such they required no special knowledge to answer survey questions. A copy of the survey form is provided in the Appendix of this report.

Table 3. List of locations where surveys were administered

Survey Locations	
Cheapside Market	Bus stop in Bridgetown (North)
Temple Yard	Bus stop in Bridgetown (South)
BWA Building	Restaurant in Holetown
UWI Gender Studies Department	Boardwalk on South Coast
UWI Management Studies Department	Grocery store in St. Andrew
UWI Chemistry Department	Restaurant in St. Andrew
UWI Campus	Shopping malls along the South Coast
Neighborhood pharmacy	Open air plaza in St. Peter
Restaurant in Dover	Grocery store in St. Lucy
Restaurant in St. Joseph	Fish market in St. Michael
Caribbean Water and Wastewater Association Conference (Oct 24-28, 2016)	

All surveys were administered by a member of the consultant team so there was an opportunity to capture other qualitative data that contextualized the survey responses provided. In addition to the survey question responses, respondents volunteered or were asked for general comments on strategies to improve the management of water and wastewater resources in the country. This data was collected and summarized during data processing, and integrated into relevant response categories. A Pearson Chi-Square Test of Independence was performed to determine statistical significant differences in responses by gender within the sample population using Statistical software package IBM SPSS (version 23).

4. Results

4.1 Literature Review

4.1.1 Population, Demographics and Gender Profile

Barbados is classified as a developing country and has achieved a high human development index with a score of 0.75 (on a scale of 0 to 1) (UNDP 2015). This high ranking reflects long life

expectancy, high levels of school enrolment and length of education, and high income per capita, all of which improved from 1980. Despite these rankings, prominent features of a 2010 Barbados Country Assessment of Living Conditions (SALISES 2012) include “the poor being associated with larger household sizes, more children 15 years and under, overcrowding in households, low human capital, low paying jobs and unemployment, female-headed, concentrated in both urban and rural areas and engagement in informal sector activity. Poorer households have few material assets with insecure tenure of property and, although there is universal secondary level education, few children are able to take advantage of such education because of their economic circumstances.” Table 4 summarizes key population and gender statistics for Barbados.

Table 4. Key Population and Gender Statistical Indicators for Barbados

Indicator	Male	Female	Total	Year	Source
Population	136,424	147,791	284,215	2015	WB 2017
Human Development Index (HDI)			Rank 38 of 187 countries. 0.75	2015	UNDP 2015
Gender Development Index (GDI)			Rank 28 of 144 countries, 0.739	2016	World Economic Forum 2016
Life Expectancy	73 years	78 years		2015	WHO 2015
Literacy Rate	99.7%	99.7%		2012	BSS 2010
Participation rate (labor force as percentage of total adult population)	67.7	60.4	63.9	2014	BSS 2010
Wage Gap (average male wage 18.9% higher than average female wage)		71.1%		2004	World Economic Forum 2016
% poor households headed by females		62.2%			SALISES 2012
% non-poor households headed by females		47%			SALISES 2012

Although there is evidence of considerable human development in Barbados this has not translated into an associated high level of gender equality. The gender gap index developed by the World Economic Forum is a measure of gender equality. On this index out of 136 countries Barbados ranks 29, with a score of 0.730 (0 = inequality, 1 = equality). According to the Barbados Country Gender Assessment (Allen and Maughan, 2016) the measure shows near equality with respect to educational attainment and health and survival with female achievement surpassing male achievement in education. In terms of economic opportunity, the attainment of women is assessed to be 80% that of men (0.791 in 2013), while in terms of political participation it is 15% that of men (0.150 in 2013). The country assessment shows that the positions of women and men have hardly changed since 2006.

Water and wastewater treatment usually fall under the field of Civil and Environmental Engineering. In the Caribbean, the main training institutions with this program are the University of the West Indies St. Augustine Campus in Trinidad and Tobago, the University of Technology in Jamaica, and the University of Guyana. Figure 1 shows total enrollment data for the overall

engineering program at UWI. Based on numbers provided in the UWI Vice Chancellor's Annual Reports 2006-2014, the percentages of females has remained constant over nearly a decade with ~30% and ~45% enrollment between 2006 and 2014 for undergraduate and graduate engineering programs. This is significantly different from the overall UWI enrollment where the proportion of females to males was 68.5% to 31.5% for total University enrolment, with the St Augustine campus having 63% female enrollment for 2013/2014. Faculties of Science & Technology exist at all three campuses, including Cavehill, and their average total female enrollment between 2006 and 2014 was 53% compared with 36% for the Faculty of Engineering. The Faculty of Science Technology includes disciplines and research relevant to the EWN-SCI proposal like chemistry for water quality testing.

As of June 28, 2016 the Barbados Water Authority had in its employment 779 persons inclusive of 219 women (28.1%) and 560 men (71.9%). The workforce age ranged from 20–67 years with a mean age of 39 years. Approximately half of the BWA employees (61 %) are aged 40-59 years, with the majority of men being 50-59 years (23%) and women 40-49 years (9.9%). The BWA staff are almost equally employed in technical (48.5%) and non-technical roles (51.5%), with technical being defined as all job titles related to project management, engineering, science, vocational, heavy equipment operation and field work activities of the utility, and non-technical referring to all other capacities. Men and women are almost evenly represented in non-technical roles (26.8% and 24.6% respectively), while there is a significantly greater proportion of the BWA staff that are men (45%) versus women (3.5%) employed in technical roles.

Employees with the requisite technical skills will be the most eligible, and first to benefit from potential jobs created by the EWN-SCI projects. From technical fields identified, the greatest disparity in employment is in the vocational area, 26.8% men to 0.8% women (Figure 1). Artisan electricians, fitters, masons, plumbers, welders, heavy equipment operators, sewage inspectors and workshop employees dominate the vocational category. The Barbados Vocational Training Board (BVTB) is one of the main vocational training institutions in the island, and data available for 2013 reported the male-female ratio of graduates as 62.7 to 37.3, very similar to 2003 ratios. These national statistics can explain the BWA vocational category gender distribution, whose available labor pool is skewed in favor of men. A small category (3%), Scientists was the only group in which women outnumbered men (2% to 1% respectively). This is not surprising, as the UWI statistics presented next show greater enrollment of women in the Faculty of Science and Technology than men. Also similar to UWI Faculty of Engineering statistics, there were more male (1.9%) than female (0.5%) engineers at the BWA.

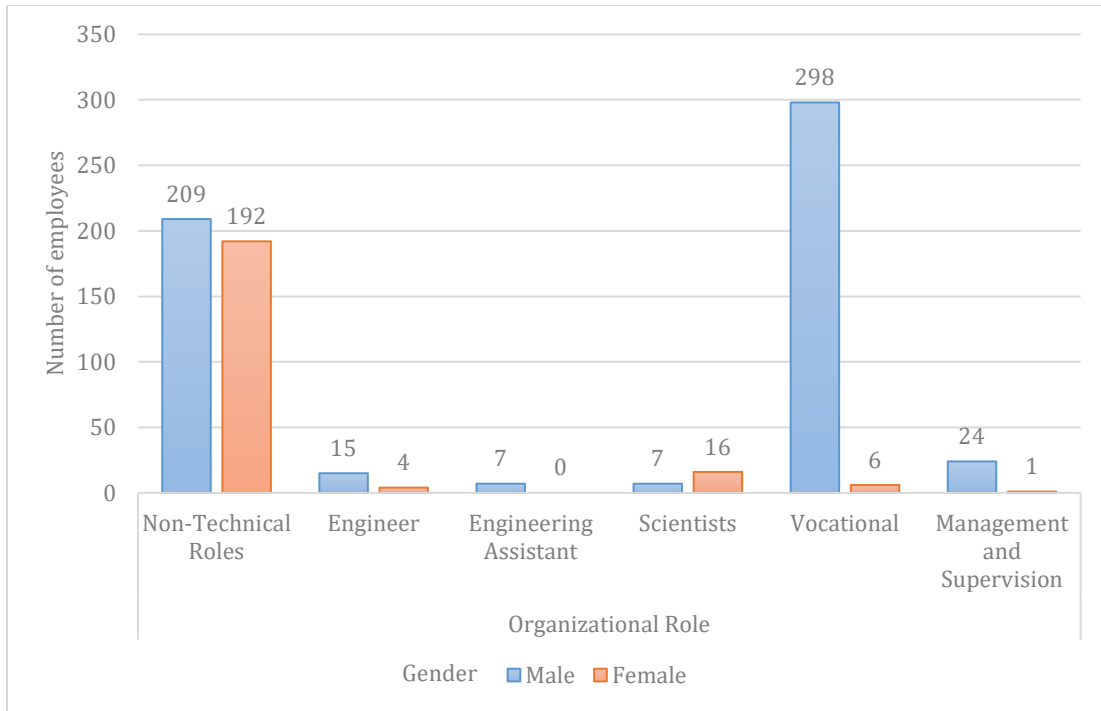


Figure 1. Gender disaggregation of technical and non-technical Barbados Water Authority employees as of 6/28/16

Similar to the technical roles, there was greater occupation by men than women in leadership and non-leadership roles. For the 101 leadership jobs identified (13% total jobs), 70.3% of them are occupied by men and 29.7% by women. Technical and leadership staff will make the greatest contribution to the design and management of projects pursued by the utility. The current gender distribution biases participation and benefit distribution which will accrue to those already present. Technical and leadership roles at the BWA place power and agency in decision making collectively with men. In spite of this, with the majority of persons in these roles aged > 40 years, and thus in the middle or nearing the end of their careers, there is an opportunity to recruit, train and promote new or existing employees to fill these roles.

Recruitment, training and promotion to fill more technical and leadership roles is just one step that can increase the diversity of opinions available to balance stakeholder views on priorities for project design and management.

4.1.2 Climate Change and Gender Policy

The Government of Barbados approved a National Climate Change Policy in 2012. The country's Intended Nationally Determined Contribution (now known as NDC) as communicated to the United Nations Framework Convention on Climate Change in 2015, lists 6 national plans and strategies for which climate change adaptation would be incorporated. These include:

- Medium Term Growth and Development Strategy 2013 – 2020;
- Physical Development Plan;

- White Paper on the Development of Tourism in Barbados and National Adaptation Strategy to Address Climate Change in the Tourism Sector in Barbados;
- Coastal Zone Management Plan;
- Storm Water Management Plan;
- Other sectoral plans including for agriculture, fisheries, water and health.

For these policies it was also noted that efforts would be taken to incorporate gender and or inclusion of perspectives of vulnerable groups. While gender issues are referred to in places in the documents relating to these developments, no strategies are articulated by which gender equity can be integrated beyond stating that vulnerable groups, variously listed to include women and young men, should be targeted and participate in action to address environmental threats and damage.

The Barbados Bureau of Gender Affairs is responsible for the integration of gender in all national development policies and programs to achieve gender equity and equality. A Draft National Policy on Gender has been formulated and is presently before parliament for consideration, however, this was unavailable for review for this report.

4.1.3 Gender, Climate Change and Water Infrastructure Projects

Gender, a socially constructed concept, refers to the roles assigned and opportunities ascribed to men and women, within a specific cultural context, and at a particular point in time on the basis of their sex (Hannan 2001, Dunn 2012). Climate change and its associated impacts on water resources are not gender neutral (Dunn 2012, Schalatek 2013). The differences in men and women’s power in decision making, access to resources and extent of participation in economic activities will determine the way people are impacted by, and their ability to respond to climate change.

With the exception of renewable energy projects, limited literature exists on creation of gender-responsive infrastructure projects. The “Resource Guide – Mainstreaming Gender in Water Management”, and “Guide on Gender Mainstreaming – Energy and Climate Change Projects,” published by the United Nations Development Program (UNDP) and United Nations Industrial Development Organization (UNIDO) respectively, provide the most comprehensive case study list of gender mainstreaming in climate change projects (Khosla 2006, UNIDO 2014). Notably missing from these publications are case studies from Small Island Developing States (SIDS), and particularly Caribbean nations. Literature and tools for categorization of the gender dimension of water and wastewater infrastructure projects to determine the scope, and types of gender mainstreaming activities required are unpublished or absent.

In the Caribbean, literature on the topic of Gender, Climate Change and Disaster Risk Management with a focus on water and sanitation issues exists. Expertise in this area exists in Jamaica at the University of the West Indies (UWI) Institute of Gender and Development Studies (IGDS), Mona Unit and the Friedrich Ebert Stiftung Foundation (Dunn 2013). Studies by McGill University for the Caribbean Water Initiative (CARIWIN) have also addressed gender differences

in water use and impacts of service interruption in Barbados (Suchorski 2009). The Center for Resource Management and Environmental Studies at UWI Cavehill also has expertise on gender and climate, with a soon to be published master's thesis on gender and disaster risk management in the Caribbean. The UWI IGDS, Cave Hill Unit has the opportunity to build capacity in this area by leveraging expertise from the Mona Unit and similar climate and gender sector experts in the Caribbean region. Building this capacity in the Caribbean is crucial to development of programs that support sustainable development goals and integrate with policies of the nation and various funding organizations like the 5Cs and the GCF.

4.1.4 Survey of Social Media Commentary

For the past year many communities in Barbados particularly in the parishes of St. Joseph and St. John have experienced extended water interruptions. As reported in different online and print media some persons have not received running water in their taps for almost a year. These stories have been shared widely on social media and the term #BarbadosWaterCrisis has been used to describe this occurrence. These posts highlight the gendered impacts of these interruptions and generate the discourse on potential long term solutions that build community and sector climate resiliency.

Barbados has a 97% potable water coverage and so these interruptions are unprecedented, and many persons in the population were not prepared to respond to this situation. Groups such as Pledge Water Barbados and Weekend Water Warriors have emerged in the wake of this crisis and have taken the lead in providing relief to these communities in the form of bottled water delivery. The situation is exacerbated as persons lament the fact that they continue to receive a bill although they have not received water. There are many reports of women's inability to cook and subsequent diet substitution with dry foods, inability to wash and clean their households and rash development on babies and young children. Reduced productivity at work due to stress from waking up at infrequent hours to gather water from standpipes when possible was another concern. Current BWA relief efforts including provision of community tanks and water trucks are viewed as inadequate particularly for the elderly who may not have someone to collect water in receptacles for them. Businesses such as hair salons and food places have also experienced economic burden as these sectors are highly water reliant.

Many persons criticize the BWA for their lack of communication which prevents adequate planning of water related household duties by individuals, particularly women. Individuals also question the criteria used by the BWA to determine priority areas for mains replacement and other infrastructure maintenance projects, as it is perceived that relief is provided to richer before poorer areas. Some persons propose that the BWA provide subsidies, or facilitate the expansion of rainwater harvesting at the household throughout the nation as part of a long term solution to water interruptions and climate variability. These issues provided additional context for the focus groups questions.

4.2 Focus Groups

4.2.1 Barbados Water Authority

The Barbados Water Authority Focus Group was held on November 1, 2016 to discuss strategies to build utility climate resiliency, assess institutional capacity for gender mainstreaming and identify opportunities to incorporate gender considerations in institutional operations and project development.

A summary of key projects or activities that can build utility climate resiliency and for which direct or indirect gender dimensions could be considered include:

a. Mains Replacement

For the proposed mains replacement the group discussed potential deficiencies in the criteria for selection of priority mains for replacement. Currently the number and frequency of bursts are the criteria used. It was suggested that social factors such as number of persons impacted, presence of schools, clinics and elderly care facilities as well as demographics of affected customer homes e.g. gender and age should also factor into the criteria for mains replacement. The Customer Service department indicated that upgrade of their management information system will allow them to capture such demographics, and share this information with other departments. This discussion expanded the focus groups traditional considerations of gender dimensions as quota requirements, to the larger scope of responsibility of the utility to its customers and gendered impacts of service provision.

b. Renewable Energy Integration

Integration of more renewable energy capacity at pump stations has the potential to create additional jobs for individuals with the requisite technical skillsets. Proposed strategies to increase the participation of the underrepresented gender in any new jobs as a result of the project included job advertisements encouraging specific applicants, and targeted recruitment of desired individuals. Internal rotation of employees was also discussed to broaden participation in jobs created, however, no consensus was reached on strategies to address concerns of the physical suitability of women for specific roles.

c. Pilot Wastewater Resource Recovery Systems

Similarly for the pilot wastewater resource recovery system, the main gender concern was the proportion of males to females currently employed with the BWA with the requisite technical skills to perform the anticipated tasks required for operation and maintenance of the system. The project was originally developed by a six-member student team from the University of South Florida's Civil and Environmental Engineering department and UWI's Student Entrepreneurial Empowerment Development (SEED) Project. The team comprised of five females, one of whom is an entrepreneur whose start up business would potentially add value (via cosmetics) to the plants grown in the pilot system. Agricultural training programs encouraging youth and women in Barbados to become agripreneurs are currently being sponsored by the agricultural sector and these participants could be targeted for interest in reuse projects.

d. Research Projects

Focus group participants believed that a research arm of the utility would greatly improve the efficiency of operations and delivery of services. Two specific projects of interest with clear gender dimensions were i) health studies that assessed the impacts of water quality and water interruptions, and ii) economic studies that assessed the feasibility of a stratified tariff increase based on customers' willingness and ability to pay for water services. A financial case for a tariff increase was particularly supported since present cost of water does not reflect true production costs, and there was the recognition that such an increase would economically disadvantage some customers/homes more than others. There was an overall recognition of the need for better communication with its stakeholders particularly at the community level. Greater stewardship of the resource at all levels of power is needed to facilitate sustainable community growth and assist in poverty reduction.

e. Internal Revolving Fund to support Household Rainwater Harvesting and Household Residential Recharge

The current water crisis in Barbados due to the prolonged periods of no rainfall raised the many challenges faced by the BWA and country, and opportunities for innovative and sustainable solutions that would require decentralized approaches. Since 1996, buildings over a certain size have been required to install rainwater tanks, however, there is no requirement that the tanks are used. Given the high cost of electricity in Barbados many people do not install pumps required to access the rainwater and some argue that the tanks end up breeding mosquitoes. Architectural designs do not take advantage of gravity fed systems and plumbing for uses like flushing toilets is not popular and some believe it is illegal. Given the potential for rainwater harvesting to offset water needs from the BWA and therefore its pumping costs, this was seen as a useful thing to encourage households to do. Similarly, with the increase of impervious areas in built environments, options to encourage rainwater recharge (e.g. rain gardens) were discussed, especially for households with little space for rainwater tanks/cisterns. The team agreed that demonstration sites for public education need to be located on BWA properties, however, they recognized the importance of showcasing existing champions throughout Barbados. Partnering with the engineers and plumbers to create manuals etc. and publicize the options was recommended by the group.

Institutional Knowledge Gaps & Other Comments – The concept of gender mainstreaming was particularly new to many of the focus group members. Organizational members could benefit from gender training that includes roles of focal points, gender sensitive budgeting and gender competency. Institutional commitments to affirmative action can also ensure increased participation of the underrepresented group in projects. Steps should also be taken to improve the current unequal employment of men and women overall (72% vs 28% respectively) and participation in supervisory roles (70% vs 30% respectively) at the BWA. Targeted interventions in this regard will significantly reduce existing gender biases in decision-making on water and wastewater management in Barbados. Sustained education and outreach initiatives by the BWA are also needed to provide opportunities for continuous community participation in planning and design of context specific solutions.

4.2.2 University of the West Indies Institute of Gender and Development Studies (UWI IGDS)

The UWI IGDS Cave Hill Unit has staff with expertise in the areas of gender, sexuality, human rights, gender-based violence, Caribbean men and masculinities, and Caribbean feminism. The areas of gender and climate change are lesser explored topics by this department. In 2015, they included a 3 hour workshop called “Women and Water for the first time in their Caribbean Institute for Gender and Development (CIGAD) biennial summer program. An environmental engineering professor from the University of South Florida taught this workshop. Faculty at the UWI IGDS sister Unit at the Mona Campus in Jamaica have already delivered gender, climate change and disaster risk reduction training to 92 undergraduates in the region and are available to guide and mentor to increase competency in Barbados. Proposed activities to integrate the Cavehill campus IGDS program with EWN-SCI include expansion of CIGAD to include additional seminars on women and water that are open to non CIGAD program participants, production of educational materials on the rationale and context for recognizing and incorporating gender perspectives in development projects, and recruitment of M.S. and Ph.D. students to pursue research that directly support EWN-SCI project goals. The group also recommended targeting its CIGAD graduates (11 institutes have been held to date) to train them on EWN-SCI topics that would be applicable to the communities where they live, and for which they can become champions for sustainable water infrastructure.

4.3 Interviews

4.3.1 Financial Institution (CDB)

The Caribbean Development (CDB) Bank has been recently accredited as a regional implementing entity for the Green Climate Fund. It has funded BWA projects in the past, some with similar components included in EWN-SCI, though not from the holistic framework for building ecosystem for sustainability driven initiatives. The Senior Operations Officer interviewed suggested that the organizations involved with EWN-SCI should work closely with the CDB to avoid duplication of efforts and build on each other’s findings. The need to build capacity at the UWI IGDWS Cave Hill Unit in development of water sector projects was identified, and strategies to do this included requests in project Terms of Reference issued for consultants to utilize the department for some sub-contracts. The CDB recently completed a gender analysis of Barbados, however, there was little emphasis on engineering and infrastructure. The organization has a gender policy that its borrowers must follow and recently hired a gender equality specialist.

4.3.2 Caribbean Water and Wastewater Association

The research team used the Caribbean Water and Wastewater Association (CWWA) Conference in Trinidad and Tobago from October 24-28, 2016 to interview utility CEOs, engineers and other water sector professionals from Barbados and the wider Caribbean.

Some participants, primarily male, were actively opposed to developing actions based on gender considerations. They believed the gender analyses were looking for problems that did not exist. There was the sentiment that there was no reason to establish procedures benefitting one or other sex because everyone is considered equal. Concepts of gender neutrality often lead to a lack of information and quantitative data through which differences can be identified. On the other hand, there was a fixation by some persons on the thought that gender equality = women equality, and for water infrastructure projects gender mainstreaming meant a narrow focus on filling job quotas. There is a lack of recognition of the skewed nature of opinions thought of as reality, due to their domination of discourses by one sex in the engineering field. There also exists an intolerance/insensitivity towards the need for maternity leave as stated by one interviewee “women enter baby making mode.”

4.3.3 Environment Protection Department

The Environment Protection Department (EPD) has recently completed a Policy Paper on Wastewater (WW) Reuse. Presently WW reuse is limited to slow drip irrigation. The EDP supports pilot projects that will demonstrate that WW reuse for agriculture is safe (subsurface irrigation) and a viable option, as well as an analysis of perceptions of WW reuse for agriculture to assess potential stigma. If a business case can be made for WW reuse, the potential to significantly expand to other systems like packaged treatment plants, septic systems, and suck wells (unlined hole in ground) can be explored to allow for distribution of these reuse benefits to all individuals. Pilot systems that also serve as demonstration sites are critical for educating the public, getting their buy-in, and building the reuse market.

4.3.4 Health Sector

“In Barbados, the solution to pollution is dilution”. These were the sentiments of a Pan-American Health Organization (PAHO) employee. There was concern with improper nutrient management from wastewater, including the BWA’s sewage treatment plants, the packaged plants of hotels and businesses, or household septic systems and suck wells. High groundwater nitrate levels are of concern for drinking water in certain parts of Barbados and the impact of nutrient loadings to the sea are of a concern for impacts on corals and marine environment. Contaminants from wastewater discharge and stormwater runoff can potentially result in increased ear, nose and throat diseases from swimming in the sea, especially just after a storm. To reduce these nutrient loads, resource recovery projects should be pursued with the incentive for people being the added value that one would get in the form of water and nutrients for potential food or an income generating agricultural product.

4.3.5 Tourism

A representative from the Caribbean Hotel Energy Efficiency and Renewable Energy Action Program (CHENACT) surmised that up to 50% of the water and energy bills of some larger hotel can be attributed to on-site leakages. Rather than reduce the water and energy consumption by pursuing efficiency measures, the hotels sometimes choose to absorb the costs or lay off staff to recoup the difference. Since 70-80% of the hospitality sector are women, women are most likely laid off as a direct result of water wastage. The BWA can recommend that hotels conduct a water audit which will identify opportunities to reduce water consumption. Additionally, the project pursued in 2010 by the BWA where they distributed 10,000 water efficiency devices should be revisited to determine number of systems installed.

4.3.6 Business

The Altman Real Estate Group was interested in reuse of the treated effluent from their Limegrove Shopping Mall for agricultural production. The group has land available for the pilot site and would ultimately like to use the produce for resale to restaurants at their mall and to the Hometown community. The Altman Real Estate Group represents one of many companies in Barbados that have decentralized wastewater treatment systems and believe that discharge of the effluent to the sea is a waste of the resource. Similar sentiments were expressed by SIR Water Management Limited, a packaged wastewater plant supplier in Barbados. At one of the SIR sites, cut flowers are grown and some areas are believed to benefit from treated effluent. A female employee was pointed out as being the reason for the inclusion of edible produce on a small part of the land which is for her personal use. Innotech manages the BWA headquarters building, including a packaged wastewater treatment plant located there. The possibility of reuse of the effluent for agriculture was seen as a positive for piloting at this facility also.

4.4 Water User Survey

The survey data broadly characterizes a representative sample of the population within each of Barbados' 11 parishes. 48% % of survey respondents were male and 52% of respondents were female. The average age of the survey respondents was 39.7 years old with a range from 18 to 84 years. The number of individuals holding a bachelor's degree— 32% is the highest percentage from the entire sample. Following this, 25% and 16% of survey respondents have finished secondary school and have an associate's degree, respectively. The top three educational levels of the respondents (i.e. bachelor's degree, secondary school, and associate's degree) have more female representation than male. Such is also the case for vocational training and primary school education. Broadly speaking, this is consistent with national statistics that show females, on average, attend school for longer than their male counterparts, 17 years for females as compared to 14 years for males (BSS 2010). However, when considering the two highest educational levels, doctoral and master's degrees, there are almost double the number of men represented (i.e. 20 males and 11 females). This is consistent with UWI demographic data for engineering, and could reflect the referrals approach used for surveys, given that the survey team and partners had high university faculty representation.

The survey data was sex disaggregated and using a Pearson Chi-Square analysis, statistical significant associations ($p < 0.05$) were only obtained between gender and parish, types of water storage containers used and presence of mosquitoes in the storage containers. This would indicate that for each of these questions, the count of men or women who selected a particular response was either more or less than would be expected for this size study population.

The primary source of drinking water for the majority of the respondents is the tap in their house (90.8%). This observation is consistent with the national statistic of 98% potable water coverage. The second most common source of primary drinking water, bottled water (7.4%) was also the most cited supplementary source (48%). The heavy reliance on piped infrastructure for the source of potable water (indicative of 43% respondents citing they have no supplementary source of drinking water) demonstrates the cultural expectation of and need for limited interruptions in supply from the water utility. There was no association between gender and any of the survey responses to source of primary drinking water and use of a supplemental source of drinking water. With reference to the use of a supplemental source by parish there was also no association observed between gender response and primary source of drinking water used.

64.6% of the survey respondents indicated that they agreed or strongly agreed that their household is satisfied with the BWA water supply system. Smaller percentages of respondents disagreed or strongly disagreed (22.7%) or were indifferent or neutral (8.7%) to this statement. In spite of access to piped infrastructure, many respondents (78.6%) stored water at the household level. Of this group, more women (43.7%) than men (34.9%) reported that they stored water. The three (3) most common responses to type of storage receptacle were buckets (25.8%), multiple containers (22.3% comprising mainly buckets, plastic bottles, and plastic tanks, and barrels in order of decreasing frequency), and plastic tanks (15.3%). The Chi-Square test ($N=180$, $p=0.024$) revealed a significant association between gender and choice of storage container used. Women were more likely to use small receptacles (buckets and plastic bottles), while men would cite larger receptacles (plastic tanks and barrels) as storage containers. Disaggregation of types of storage containers used by parish revealed no significant association.

With a projected drier climate in the Caribbean (UNEP 2010), expansion of rainwater harvesting (RWH) at the household level is a potential solution to build community resilience and safeguard from water interruptions from the BWA. The preference for use of plastic tanks and barrels by men could indicate an easier adoption and maintenance of RWH systems that use these larger receptacles. Assistance of some kind (extension officers, grants, subsidies) to install these systems, or for redesign of the RWH system to include preferences by women and ensure its affordability may be specifically needed to ensure both groups benefit equally from such an intervention. Affordability of design is very important as some households rely on their relatives in Diaspora to provide monetary support that will cover costs for household infrastructure upgrades. For example one custodian from the parish of St. Lucy indicated that her family who lived overseas paid for a water storage system for her that is on a platform with a pump. The initial installation of this system was at a cost of approximately \$2,000, she incurs a recurring cost for purchase of filters. She does not mind this additional cost as she grew up going to a plantation property to go to a well to get water, and is thankful for the BWA piped water today. The

Government of Barbados distributed inflatable water storage containers that are smaller than the plastic tanks and barrels, and can be considered in the approach of increasing storage capacity at the household level.

The two (2) main reasons reported for water storage at the household level were “Multiple Concerns” (32.8%) and “as a back-up during interruption from BWA” (28.4%). In order of decreasing frequency, the category Multiple Concerns (32.8%) included “as a back-up during interruption from BWA”, “for household convenience”, “in case of natural disaster” and “as water source in dry season”. One respondent from Bathsheba in the parish of St. John indicated that she stores 37 buckets of water at home since water coming through her tap has been infrequent in previous months.

Reuse of water at the household level for different purposes and from varied sources was not a common practice by the survey respondents (71.6%). Although most survey respondents did not reuse, many were not opposed to the concept of wastewater reuse for irrigation. For example one woman from the market who sells produce, but does not own land indicated that she would love to have access to land for planting, and has no problem using treated wastewater for irrigation. She watches television and sees there is technology available to clean the wastewater so persons won't get sick. She believes it is done in China, and thinks the food that they import from China would likely have been irrigated with wastewater.

Roughly half of the survey respondents (51.5%) reported that they administered treatment of some form to their primary drinking water source. Use of a household filter (21.4%) and boiling (17.9%) were the most common water treatment practices observed. In instances where water treatment was observed respondents indicated the water was being used for children.

The majority of respondents (66.4%) either agreed or strongly agreed that they were satisfied with the water quality provided by the BWA. A much smaller number of respondents (18.3% and 10.9%) either disagreed or strongly disagreed, and were indifferent or neutral, respectively about their satisfaction with the BWA water quality. Most Barbadians are satisfied with the BWA's water quality. Qualitative information obtained during data collection indicates that persons primarily treat the water by boiling for use in tea and for use by babies. The use of softeners was to correct for taste, which was often attributed to the limestone in the water. A small number of respondents reported an infrequent need to purge the pipe due to increased sediment loads observed after a repair in the pipe distribution network. The majority of respondents (61.6%) disagreed or strongly disagreed with the statement that BWA water negatively impacted their health.

Knowledge gaps on the type of wastewater management services used were highlighted in the question – “How do you maintain your septic system?” 49.8% of respondents reported that they did not use a septic tank but instead used a suckwell. Further disaggregation of this information by parish revealed that 46.9% of the suckwell responses were for the parishes of St. Michael and Christ Church. In Barbados only these 2 parishes are connected to the sewer, and it is possible that some of these responses are incorrectly attributed to use of a suckwell as it is mainly the

tourist locations connected to the centralized wastewater treatment plants. An additional 17.9% of the respondents indicated that they did not know how their septic tank was maintained. Of those respondents indicating a connection to the sewer (9.2%), 3.9% or 9 responses incorrectly indicated this choice, given the parishes where they lived. Of those who reported having a septic tank, 15 % indicated that their septic tank was pumped regularly (5-7 years).

Most persons reported that they used the BWA Hotline (38.3%). A Multiple Methods approach (15.3%) was the second most cited response and this was usually a combination of the BWA Hotline, a visit to the BWA Office and/or a Call to a BWA Employee. A large number of the study population indicated that they Never Contact the BWA (34.1%). Qualitative information received for this question usually cited a perception that their concerns will not be addressed, or that they had no problems and thus never contacted the utility. Radio Ads were the common method cited (21.4%). A close second response was Multiple Approaches (21%), which comprised mostly radio ads, word-of-mouth and newspapers. The largest individual response category (34.5%) to this question was that many persons were Never Informed by the BWA on new projects or changes in service. In general, women were more likely to cite that they received some form of information from the utility, and this may be due to a greater interest and need to know about interruptions or changes in the service which directly impact their water-related domestic activities.

There is a bottleneck in the flow of information or communication between the BWA and its stakeholders, with persons feeling that their concerns may not be addressed if they contact the utility, and/or that the utility does not do enough to engage with all sections of the population. The social media analysis revealed a missed opportunity for the BWA to engage with stakeholders online, and these further reiterate and highlight the isolation of some persons from communicating with the utility. Clear communication policies that leverage most of these used and received methods of communication are needed. In spite of these bottlenecks, the majority of survey respondents (34%) either agree or strongly agree that their concerns are addressed. 24.8% of the respondents either disagree or strongly disagree that when they contact the BWA their concerns are addressed. A smaller section of the study population (8.3%) reported indifference or neutrality to the question.

Most respondents (78.2%) agree or strongly agree that their opinions should be considered in decisions made about water management in Barbados. Few responses of indifference or neutrality (11.8%) and disagree or strongly disagree (2.2%) were recorded. Average monthly expenditure for 81.7 % of the study population ranged from BDS \$25-\$600 with a mean and median of BDS \$83.97 and BDS \$60 respectively. The most cited (36.6%) expenditure range was BDS \$25-\$50 and this was populated by mostly women (58.3%). The minimum possible monthly expenditure on water from the BWA is \$32 comprising the connection fee and up to 8 m³ of water. Some respondents (9 or 3.9%) quoted expenditures under BDS \$32, which likely reflects a credit or subsidy. Another 14.8% of the study population reported that they didn't know the cost of the water because it was included in their rent. Eight respondents (3.5%) did not provide a response and in most instances, it was because they did not know. One individual reported that

they hadn't received a water bill in months since their water meter had been broken and attempts to get it fixed had been unsuccessful.

Responses to questions on the average monthly expenditure on wastewater revealed a lack of knowledge on this area. Only the parishes of St. Michael and Christ Church (which make up 46 % of the study population) have some sewage coverage. Of this population, 39% indicated that they were not connected to the sewer. Only 4.8 % of the respondents were able to provide expenditure values that ranged from BDS \$0.50-\$66 with a mean and median value of BDS \$32.7 and \$35 respectively. It should be noted that some of the prices quoted that were less than BDS \$6 seemed unreasonable and are most likely inaccurate. Limited data points made statistical tests for gender association with responses recorded not possible. While 60.3% of respondents indicated that they purchased water, but only 42.8% of them could provide expenditure amounts. The expenditure ranged from BDS \$2-\$500 with a mean of BDS \$56.5 and median of BDS \$27.

5. Summary & Recommendations

Gender mainstreaming entails setting gender outcomes, outputs and indicators to track the project's progress in changing conditions of men and women in terms of power, agency, participation and access to resources. The following recommendations have been developed to incorporate gender findings throughout the project, or to assist in further understanding issues that need to be addressed:

- Create a gender-responsive budget that allocates resources for a gender focal point to coordinate integration of gender analysis findings, and reflect commitments to gender objectives.
- Develop and provide routine gender training to recognize and raise awareness of the disparity in stakeholder representation and take corrective action to balance stakeholder views.
- Formulate institutional gender policy & partner with UWI IGDS to build capacity on gender and infrastructure in Barbados.
- Ensure institutional commitments to gender integration in organizational policies. - In-depth gender analysis and impact assessment is conducted
- Set reasonable targets for increased participation of underrepresented groups in instances of job creation that goes above baselines and that are supported by appropriate recruitment efforts.
- Set measurable gender outcomes for project in terms of persons trained and livelihoods improved.
- Develop clear communication policies (inclusive of a social media presence) on information dissemination and follow-up to address stakeholder concerns.
- Include social factors such as gender impacts and presence of vulnerable groups in criteria for prioritizing operation and maintenance activities like pipe replacement.

- Produce educational materials on the rationale for inclusion of gender perspectives as smart economics in water sector development projects, and recruit M.S. and Ph.D. students for the UWI IGDS to pursue research that directly support EWN-SCI project goals.
- Ensure equal voice among women and men in the decision-making processes of the project & as water champions in communities.
- Explore the potential of decentralized projects like rainwater harvesting in increasing customer resiliency during water supply shortages and natural emergency situations.
- Monitor with sex disaggregated data the impacts of project components and use to evaluate progress towards gender targets.
- Current skillsets for technical jobs bias allotment to men, there will be need for targeted training, recruitment and promotion of women to fill these roles. Potentially partnering with the technical training institute should be explored.

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<p>(a) as back up during interruption of BWA services (b) as independence from BWA network (c) as a source of non-contaminated water (d) for household convenience (e) as a water source in dry season (f) as a water source in wet season (g) as a source in case of natural disaster (h) to reduce the cost of water bill from BWA</p>	<p>(c) install toilets with low-flow water usage (d) add chemicals to help breakdown in septic system (e) i do not use septic, I am connected to the BWA system (f) i do not use septic, I treat my wastewater by (write in):</p>
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<p>15. How do you contact BWA? (Select all that apply)</p>	<p>16. How does BWA inform you of new projects, changes, or issues to your water and sewage services? (Select all that apply.)</p>
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<p>(a) call BWA Hotline (b) post on social media (c) email customer care (d) post letter to BWA (e) fill out form on BWA website (f) visit a BWA office (g) attend public meetings (h) never contact BWA directly (i) other, please write in:</p>	<p>(a) flyer at payment stations (b) social media updates (c) emails (d) posted mail (e) door-to-door fliers (f) TV ads (g) radio ads (h) billboard (i) community meetings (j) word-of-mouth (k) surveys (l) never been informed (m) other, please specify</p>
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17. For the past three months, what is your household’s average monthly expenditure on
a) water services? BDS\$_____ b) wastewater services? BDS\$_____

18. If you buy water (outside of BWA), how much do you spend on purchased water per month?
BDS\$_____.

19. Given your current monthly consumption, what is the maximum your household would be ABLE to pay per month for water services? BDS\$_____.

20. Given your current monthly consumption, what is the maximum your household would be WILLING to pay per month for water services? BDS\$_____.

Using a scale of 1 to 5 please indicate the level of satisfaction with items listed below. The numbers indicate
1 – I strongly agree 2 – I agree 3 – I am indifferent 4 – I disagree 5 – I strongly disagree
6 – This question does not apply to me

ITEMS	1	2	3	4	5	6
21. When I contact BWA, my concerns are addressed?						
22. I should you be able to contribute to decisions made about water projects?						
23. The current cost for the water service offered is reasonable						
24. The current cost for the wastewater service offered is reasonable						

25. Overall, my household is satisfied with BWA's water supply system						
26. Overall my household is satisfied with BWA's water quality						
27. I am concerned that BWA's water quality negatively affects the health of my household. Some of my concerns are:						