

INSTITUTE OF MEDICINE

Global Environmental Health Research Gaps and Barriers for Providing Sustainable Water Sanitation and Hygiene Services



**Approaches to Sustainability
Global Water Partnership
PAHO Auditorium
Washington DC**

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The Caribbean





The Caribbean

Country	Annual Rainfall (Inches)	Annual Rainfall (Millimetres)
Anguilla	40.2	1021
Antigua & Barbuda	40	1016
Aruba	21.3	541
Bahamas	49.3	1252
Barbados	46.7	1186
Belize	72.3	1836
Bermuda	56.5	1435
Bonaire	21.3	541



The Caribbean cont'd

Country	Annual Rainfall (Inches)	Annual Rainfall (Millimetres)
British Virgin Islands	27	686
Cayman Islands	46	1168
Costa Rica	132.1	3355
Curacao	21.3	541
Dominican Republic	54.5	1384
Guadeloupe	70.3	1786
Guyana	74.6	1895
Honduras	99.1	2517



The Caribbean cont'd

Country	Annual Rainfall (Inches)	Annual Rainfall (Millimetres)
Jamaica	50.709	1288
Martinique	76.2	1936
Mexican Caribbean	50	1270
Puerto Rico	52.9	1344
St. Lucia	60	1524
Trinidad & Tobago	67.7	1720
U.S. Virgin Islands	40	1016
Venezuela	35.6	904



Issues Impacting on Water Resources

- **Annual per Capita Freshwater Availability is below 1000 m³ (except for few countries)**
- **Integrated Water Resources Management is not practiced widely**
- **Countries are very dependent on rainfall to replenish aquifers and surface water sources.**



Issues Impacting on Water Resources cont'd

- **Climate Change and Variability:**
 - **Changes in rainfall patterns causes shortfall in water reserves**
 - **Longer dry periods causing reduce stream flows**
 - **Reduction in reservoir storage**
 - **High intensity short duration rainfall leading to flooding and inundation.**



Issues Impacting on Water Resources cont'd

- **Climate Change and Variability**
 - **Rainfall pattern changes causing greater rainfall out of catchment areas.**
 - **Increase in frequency of extreme events.**



Issues Impacting on Agriculture/ Tourism

- **Agricultural sector highly dependent on freshwater for irrigation and crop production.**
- **Agricultural Infrastructure is inadequate to cope with changes in rainfall patterns.**
- **Need for new infrastructure, dams & well sources and more efficient irrigation technologies e.g. Drip feed system**



Issues Impacting on Agriculture/Tourism cont'd

- **Need for research and development for drought resistant crops.**
- **Tourism demand accounts for a fair volume of water.**
- **Water is also needed for the irrigation of golf courses.**
- **Recycling is recommended and should be practiced to reduce demand on potable supplies.**



Issues Impacting Water Supply Systems

- **Tariffs are relatively low**
- **Water is still not treated as an economic good**
- **Rating structure does not penalize wastage**
- **No metering policy in some countries**



Issues Impacting Water Supply Systems cont'd

- **Water supply infrastructure is old and inadequate to provide expected service**
- **Demand has outstripped supply**
- **Distribution mains have a high level of leakage in excess of 50% in cases**
- **Increased population densities, new residential development and tourist resorts**



Issues Impacting Water Supply Systems cont'd

- **Sediments from soil erosion on newly cleared slopes, agricultural practices, increased utilization of chemicals and increase in clearing of land for housing causing a deterioration of water quality.**
- **Contamination of rivers/water courses by poorly performing wastewater treatment plants**



Issues Impacting Water Supply Systems cont'd

- **Sea level rise and occasional flooding causing contamination of aquifers**
- **Sea water surges during hurricanes/ storms causing contamination of water supplies**



Issues Impacting Coastal Waters

- **Agricultural chemicals usage in the higher reaches of the watershed causes migration into the coastal areas and beaches affecting ecosystems/habitats**
- **Inadequately treated sewage causing contamination of the coastal waters – high levels of faecal coliform**



Issues Impacting Coastal Waters cont'd

- Coastal algal blooms causes destruction of coral reefs and coastal habitats and biodiversity
- Processing plants discharging into the nearby rivers contaminating the coastal waters



Climate Change Impact Mitigation:

- **Need to plan based on extreme events rather than from historical data**
 - 1) **Design of larger storage reservoirs to cater for long dry spells or short period of high intensity rainfall**
 - 2) **Utilize urban catchments that collect and pump runoff from the catchment to storage reservoirs as is being done in Singapore**



Climate Change Impact Mitigation:

- 3) Pursue treatment of sewage to very high quality standards using reverse osmosis filtration to allow for recycling, reuse again as in Singapore.**



Climate Change Impact Mitigation:

- 4) The use of desalinated technology to produce water in supply like Trinidad & Singapore.**

- 4) The use of conservation principles to ensure the sustainable use of the resource**



Climate Change Adaptation

- IPCC + Studies in the region have confirmed that the region is vulnerable to Climate Change
- Agriculture, Tourism, Water and the Health Sectors will be affected
- There is a need to:
 - Quantify the extent of the impact on sectors
 - Develop Sectoral Models
- Need to develop Scenarios e.g. Crop Yields
e.g. Vulnerability Maps
- Training and Funding would be needed



Disaster Preparedness

- **The region is very vulnerable to Hurricanes and Flooding**
- **Increasing frequency of greater magnitude (Category 3, 4, 5) Hurricanes**
- **Greater need to mitigate impact of disasters**
- **Need for Risk Assessment**
- **Need for DP Committees to deal with plans, Vulnerability Assessments, Procurement of Emergency Resources**
- **Need for standby power supplies**
- **Need for communication systems and coordination with regional bodies e.g. Caribbean Disaster Emergency Response Agency (CDERA)**



Global Water Partnership (GWP) Activities

- **The GWP is aware that there are a number of Regional Bodies working in the Region, these include:**
 - ✓ **Caricom Environmental Health Institute**
 - ✓ **Caribbean Water and Wastewater Association**
 - ✓ **United Nations Environmental Program**
 - ✓ **Integrated Watershed and Coastal Areas Management (GEF IWCAM)**
 - ✓ **NGOs & CBOs**



Facts about the GWP

- **Created in 1996, the Global Water Partnership is a global network of stakeholders committed to the sustainable management of water resources.**
- **The mission is to support countries in the sustainable management of their water resources.**



Facts about the GWP

- **Global Water Partnership – Caribbean (GWP-C) was formally launched by the Prime Minister of Grenada, the Honourable Dr. Keith Mitchell on June 9th 2004 in Tobago.**



Facts about the GWP

- **GWP – C comprised of working partners and stakeholders in water management in the Caribbean. There are currently forty (40) partners from 16 different Caribbean Islands.**



Facts about the GWP

- **The Caribbean Water and Wastewater Association (CWWA), in conjunction with the Global Water Partnership – Caribbean (GWP-C), has held three Ministerial Forums on Water to date:**
 - ✓ **1st Forum in Barbados – 13th-14th October 2005**
 - ✓ **2nd Forum in Tobago – 3rd-4th October 2006**
 - ✓ **3rd Forum in St. Kitts – 2nd-3rd October 2007**



Facts about the GWP

- **Sponsored dialogues in:**
 - Jamaica
 - Puerto Rico
 - Grenada
 - Guyana
 - Dominican Republic
 - Haiti

- **Held IWRM workshops and CWP sensitization meetings in:**
 - St. Kitts
 - St. Lucia
 - Antigua.



Facts about the GWP

- **Currently working on establishing Country Water Partnerships in:**
 - **Jamaica**
 - **Trinidad and Tobago**
 - **Grenada**
 - **Puerto Rico.**



Facts about the GWP

- **Completed –**

- 1) **the designing of a comprehensive IWRM database.**
- 2) **GWP-C website is also in the design stage.**



Facts about the GWP

- **GWP-C is working on a Rainwater Harvesting model for the poor rural communities in the Caribbean. This model will be easily adaptable to each island's specific needs.**



Facts about the GWP

- **Partnership with Cap-Net has lead to the establishment of Caribbean WaterNet in 2006 to address capacity-building needs in the region. Several training workshops have been completed to date.**



Thank You!