



## Thematic Programme of Action B Water efficiency, re-use and augmentation

### Relevant regional partners<sup>1</sup>

CARPHA, CAWASA, CCCCC, CTO, CWWA, GWP-C, IFIs, PAHO, UNEP CAR/RCU, UWI

### Relevant national partners<sup>1</sup>

Ministries responsible for Water Resources and supply, Ministries of Finance, Ministries of Environment, Water Utilities, Industry Associations

### Summary

Caribbean water utilities suffer high rates of non-revenue water (in some cases up to 50%) due to a combination of factors including high levels of leakage, aging infrastructure and the prioritisation of new connections over maintenance programmes. These issues compound the effects of drought by increasing the demand placed on water sources. Climate change is likely to impact on water availability and compound water scarcity issues in the future. In addition, leakage exacerbates the high expenditures on energy required for pumping and treatment, with some utilities expending 40% of their budgets on energy. Managing the demand for water will help countries make better use of existing water resources, reducing the need for expensive desalination and maintaining more water for other users and the environment. Demand management at the household, business and utility level through technological, process and behavioural change is required to support the overall efficiency of water use across the region.

**The Programmes in this Thematic Programme of Action focus on enhancing water security through improved efficiency in water use.**

#### Programme B.1 – Household demand management

**Programme Objectives:** Supporting community resilience to drought through enhanced water efficiency and water augmentation at the household level

#### Programme B.2 – Water and energy efficiency for water utilities

**Programme Objectives:** Supporting water utilities manage leakage, non-revenue water, energy demands and carbon emissions for multiple environment and economic benefits

#### Programme B.3 – Water user efficiency for large scale water consumers

**Programme Objectives:** Targeted interventions aimed at large consumers of water to increase efficiencies, providing cost savings and enhancing resilience to drought risks

<sup>1</sup>Partners identified are indicative, not exhaustive, and are intended as a starting point

## Water efficiency, re-use and augmentation

### Programme B.1 – Household demand management

**Programme Objectives:** Supporting community resilience to drought through enhanced water efficiency and water augmentation at the household level

Alignment with SDGs	6.1 Water supply	6.2 Sanitation	6.3 Water quality	6.4 Water efficiency	6.5 IWRM	6.6 Water ecosystems	11.5 Water related disasters	13 Climate Change
Alignment with Regional CARICOM Climate Change Framework	Adaptation policy, strategy, capacity and awareness		Implementing adaptation measures		Low carbon development		Vulnerability reduction	Forest management
Indicative cost	<ul style="list-style-type: none"><li>• Low cost for behavioural change and pilot projects.</li><li>• High costs for large scale subsidies and financial incentives.</li></ul>							
Lead time	Short – building on ongoing initiatives and expertise in the region.							

In some countries, demand for domestic water forms a substantial component of total water abstractions. Managing water demand at the household level will help communities become more resilient to drought and support utilities by reducing the volumes of water which are treated and pumped to consumers. This Programme may contain the following activities:

- Awareness, advocacy and education campaigns at a variety of levels;
- Investigation of incentive schemes such as subsidies on household demand management devices;
- Review and realignment of planning regulation to move towards low consumption domestic development;
- Promotion of rainwater harvesting to augment piped water supplies; and
- Investigation of the potential to re-use and recycle grey water at the domestic level for irrigation and other non-potable uses, when properly controlled.

**Relevant regional experience:** A number of regional organisations work on these elements including GWP-C and CARPHA's work on rainwater harvesting, and these types of programmes would be relatively straightforward to scale-up and implement.

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Programme B.2 – Water and energy efficiency for water utilities								
Programme Objectives: Supporting water utilities manage leakage, non-revenue water, energy demands and carbon emissions for multiple environment and economic benefits								
Alignment with SDGs	6.1 Water supply	6.2 Sanitation	6.3 Water quality	6.4 Water efficiency	6.5 IWRM	6.6 Water ecosystems	11.5 Water related disasters	13 Climate Change
Alignment with Regional CARICOM Climate Change Framework	Adaptation policy, strategy, capacity and awareness		Implementing adaptation measures		Low carbon development		Vulnerability reduction  Forest management	
Indicative cost	Low cost for studies, assessments and behavioural change interventions. High cost for capital works.							
Lead time	Short for initial studies and pilots, medium to long term for investment in infrastructure.							
<p>Leakage and non-revenue water (NRW) are key issues for Caribbean utilities with rates reaching up to 50% of total water inputs to supply systems in some cases. This means that utilities are abstracting, treating and pumping more water than is required, increasing operating costs and reducing environmental flows. The region is already working on NRW and leakage, for example Barbados is currently implementing a programme to address this issue. Leakage and NRW also results in high energy costs for treating and pumping water. Increasing water and energy efficiencies and deploying low-carbon energy sources brings multiple environmental and economic benefits. A regional programme could include the following activities:</p> <ul style="list-style-type: none"><li>• Knowledge sharing, capacity building and learning lessons intra-regionally and inter-regionally;</li><li>• Comprehensive hydraulic modelling of water supply systems, including capacity development, to allow assessment of NRW and development of cost effective interventions to manage NRW;</li><li>• Technical studies on the economic case for NRW reduction and preparation of investment plans;</li><li>• Technical studies on energy and carbon efficiency in water supply, including the identification and assessment of options to reduce energy consumption and carbon intensity through actions such as more efficient technology;</li><li>• Investigation of the economic, social and environmental potential for closed cycle systems such as recycling grey water, energy and nutrients from wastewater;</li><li>• Developing investment plans for energy efficiency and investment in low carbon green energy solutions such as solar and energy / nutrients from waste; and</li><li>• Facilitating access to finance to support programmes including metering, network upgrades and information management systems.</li></ul> <p><b>Relevant regional experience:</b> This Programme will build on the experience of water utilities across the region in managing leakage and non-revenue water through a various projects and initiatives, and benefit from regional cooperation and knowledge sharing regional organisations such as CAWASA and CWWA.</p>								

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Programme B.3 –Water user efficiency for large scale water consumers								
Programme Objectives: Targeted interventions aimed at large consumers of water to increase efficiencies, providing cost savings and enhancing resilience to drought risks								
Alignment with SDGs	6.1 Water supply	6.2 Sanitation	6.3 Water quality	6.4 Water efficiency	6.5 IWRM	6.6 Water ecosystems	11.5 Water related disasters	13 Climate Change
Alignment with Regional CARICOM Climate Change Framework	Adaptation policy, strategy, capacity and awareness		Implementing adaptation measures		Low carbon development		Vulnerability reduction	Forest management
Indicative cost	Low cost for studies and assessments (where gaps exist). Medium cost for pilot projects. High cost for capital works.							
Lead time	Short for initial studies and pilots, medium terms for regulatory and policy regimes and to long term for investment in infrastructure.							
<p>Water use in agriculture, tourism and industry are major components of overall water abstraction in many Caribbean countries. Given the importance of these activities in maintaining livelihoods and economic development, ensuring their efficient use of water resources is important for maintaining a competitive edge. Increasing the efficiency of large water users also brings benefits in terms of conserving water for environmental and other uses, especially during periods of drought. This Programme could include the following activities:</p> <ul style="list-style-type: none"><li>• Identification and assessment of major water consumers, such as industrial facilities, tourism businesses and agro-businesses, amongst others;</li><li>• Development of initiatives with major water users to identify feasible water efficiency options, including the piloting of innovative technological solutions where appropriate; and</li><li>• Development of incentives and support interventions to support efficiency (financial, policy, regulatory) with all water consumers including domestic users.</li></ul>								
<p><b>Relevant Regional Experience:</b> This work builds on work carried out by PAHO and the CTO on water demand management and by GWP-C on water use efficiency.</p>								

### Immediate projects identified by regional partners

Regional organisations have identified project concepts within programme areas articulated above which can be implemented in the short term. Relevant regional project concepts for this thematic area and programmes are presented below.

Regional Agency	Possible Regional / International Partner	Confirmed Regional / International Agency Project Partner	Scope / Possible Project Countries	Possible / Proposed National Partners	Project Title	Project Description
CARPHA/ GWP-C		UNEP-CAR/RCU, GIZ	Regional	Water Utilities, Water Resources Agencies, Ministries responsible for Water	Caribbean Rainwater Harvesting (RWH) Programme	Caribbean Rainwater Harvesting Programme - Updating and Continuation of the Programme developed by CEHI/CARPHA. The Programme speaks to RWH awareness raising, capacity building, legislative and policy development and infrastructural development.
CARPHA	PAHO, CTO		Regional	Ministries of Tourism, Ministries of Health	Water Use Efficiency and Water Safety Planning for the Tourism Sector	Demand side water management within the tourism sector, including water loss reduction devices, low volume water use fixtures and conservation practices. Also focuses on the protection of water quality.
CERMES at UWI	CAWASA, CWWA		Regional	Water Utilities	Water supply modelling for NRW reduction	A key entry point to effectively managing NRW is the ability to understand water network performance, and to model the impact of upgrades and changes to operational practices. This project would undertake comprehensive hydraulic modelling of water supply systems, including capacity development, to allow assessment of NRW and development of cost effective interventions to manage NRW.



CARPHA	Caribbean Public Health Agency
CAWASA	Caribbean Water and Sewerage Association Inc.
CCCCC	Caribbean Community Climate Change Centre
CERMES	Centre for Resource Management and Environmental Studies
CTO	Caribbean Tourism Organisation
CWWA	Caribbean Water and Wastewater Association
GIZ	Gesellschaft für Internationale Zusammenarbeit
GWP-C	Global Water Partnership Caribbean
IFIs	International Financial Institutions
NRW	Non-Revenue Water
PAHO	Pan American Health Organisation
RWH	Rainwater Harvesting
UNEP CAR/ RCU	United Nations Environmental Program Regional Coordinating Unit for the Caribbean Environment Programme
UWI	University of the West Indies



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