



Rainwater Harvesting

MAKING EVERY DROP COUNT IN THE CARIBBEAN



Climate change studies suggest that there will be drier and longer dry seasons across most of the Caribbean basin in the future. When rain does fall, the rainfall events are likely to be heavy downpours which will increase the likelihood of flooding. Increased temperatures, more intense hurricanes and sea level rise are also expected.

Such changes will affect the fresh water resources of every nation in the region. As sea levels rise, there will be a greater likelihood of saltwater intrusion into underground fresh water systems along coastal areas. This threat of saltwater contamination will leave the Caribbean islands especially vulnerable, as many depend heavily on groundwater for their drinking supplies. Countries like Antigua and Barbuda and Barbados, which are already categorised as water scarce will certainly be impacted.

Globally, one of the solutions being encouraged by organisations like Global Water Partnership-Caribbean (GWP-C) to help manage the effects of climate change and water scarcity is public education and the introduction of practices, like rainwater harvesting.

In particular Rainwater Harvesting (RWH) is being promoted by GWP-C, as a technique to augment existing potable municipal supplies, and as a readily accessible emergency source of water in case of natural disasters like hurricanes and floods, which may disrupt access to the main municipal water supply. RWH is seen as one of the means of building climate resilience into the water sector in the Caribbean.

RAINWATER HARVESTING — RESTORING AN OLD CARIBBEAN TRADITION

Rainwater Harvesting (RWH) is a centuries-old system for ensuring water security and was at one time widely practiced in the Caribbean as a main source of household water supply. However, with expanded access to potable, pipe-borne water, there has been a move away from RWH and a perception that the practice is outdated.



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But in the face of concerns about climate change and water scarcity, rainwater harvesting could be set to make a comeback in the Caribbean, becoming a formal part of the region's strategic planning. The GWP-C's Water, Climate and Development Programme (WACDEP) recognises rainwater harvesting as one of the possible approaches to securing the region's water supplies.

“Rainwater harvesting is one of the important tools to ensure resilience in Caribbean water supplies, in particular to augment existing municipal water supplies.”

- Dr. Natalie Boodram, Programme Manager, GWP-C Water, Climate and Development Programme

One advantage is that the technology is already in place, with many rural householders who cannot access government supplies, collecting rainwater from their roofs for daily household use. Approximately 500,000 people in the Caribbean currently utilise rainwater harvesting especially in countries like The Bahamas, British Virgin Islands and Antigua and Barbuda.

In recent years, some of the Caribbean's water scarce countries have made significant investments in desalination plants which convert seawater to fresh water. However, desalination comes at a significant cost due to the high energy inputs needed and desalination plants remain vulnerable to disruption during times of disaster. Furthermore, it is important to build redundancy into Caribbean water supplies by ensuring access to multiple sources of water if one supply is disrupted. Thus, if desalination is used at a national level, rainwater can provide an additional, alternative and emergency supply at the household level.

“In Small Island Developing States (SIDS) rainwater harvesting is a key element in Disaster Risk Reduction and provides a means of building climate resilience into localised development plans.”

- Wayne Joseph, Regional Coordinator, GWP-C

ABOUT GLOBAL WATER PARTNERSHIP-CARIBBEAN (GWP-C)

Global Water Partnership-Caribbean (GWP-C) is the Caribbean arm of the Global Water Partnership (GWP) Organisation, a network of over 2900 partners worldwide, all working toward a water-secure world. Established in June 2004, GWP-C works to support Caribbean countries in the management of their water resources promoting and fostering an Integrated Water Resources Management (IWRM) approach at the community, national and regional levels.

In partnership with the Caribbean Council for Science and Technology (CCST), the Global Water Partnership-Caribbean (GWP-C) received grant funding from the Perez-Guerrero Trust Fund (PGTF) to finance a Rainwater Harvesting (RWH) project aimed at building awareness of the benefits of RWH in the Caribbean.

With many poor and rural communities throughout the Caribbean living without a pipe-borne supply of water — often, their only source coming from rivers and streams, rainwater or paying for delivery by water trucks — the GWP-C saw the introduction of safe and modern rainwater harvesting practices to the region as a viable solution for water scarce communities, and a means of self-reliance.

WORKING WITH PARTNERS



To undertake the project, GWP-C contracted the Caribbean Environmental Health Institute (CEHI) who had conducted extensive research in the region, about best practices in rainwater harvesting.

The groundwork carried out by CEHI indicated that the traditional practices of rainwater harvesting could be improved by the introduction of simple technologies, and that most water quality standards could be met by the application of basic practices.



Through their research, CEHI identified a method of RWH which could be implemented in the region. As a result, a RWH model (including a mock-up house with guttering, downspouts and water storage tank) and an accompanying online Toolbox

were developed to help promote the methodology. GWP-C has since been able to use its RWH model to creatively introduce best practices in RWH to rural communities in the region, also sharing this knowledge at various national and regional fora.



TOOLS FOR HARVESTING

The GWP-C online Rainwater Harvesting Toolbox, which is a support component to the model, is also being used as an educational tool to enhance awareness of rainwater harvesting in the region. It is made up of a wide range of resources such as a Caribbean Handbook on RWH; technical leaflets and reports; brochures; posters; videos and other media products on the subject of rainwater harvesting in the Caribbean. The GWP-C online Rainwater Harvesting Toolbox can be accessed at www.gwp-caribbean.org.

A screenshot of the "Toolbox Rainwater harvesting in the Caribbean" website. The header features the word "Toolbox" in large black letters, with "Rainwater harvesting in the Caribbean" below it. To the right is the "Global Water Partnership Caribbean" logo. Below the header is a navigation menu with buttons for: BACKGROUND, TECHNICAL PRODUCTS, EDUCATIONAL PRODUCTS, POLICY AND ADVOCACY, ONLINE RESOURCES, ABOUT RWH, RESEARCH PUBLICATIONS, RADIO AND PUBLIC SERVICE ANNOUNCEMENTS, REGIONAL PROGRAMME FOR RWH, CARIBBEAN WATER AGENCIES, RWH IN THE CARIBBEAN, MAPPING PRODUCTS, PROMOTIONAL FILM, NATIONAL PROGRAMME FOR RWH, INTERNATIONAL WATER AGENCIES, GLOSSARY, RWH AND A QUINER RECHARGES, POSTERS AND TECHNICAL BROCHURES, MEETINGS, DEMONSTRATIONS, RWH HANDBOOK, and FACT SHEETS. At the bottom, there are links for "About the Toolbox" and "About the GWP-C". A small text block at the very bottom states: "The Rain Water Harvesting Toolbox was developed with grant funding from the Perez Guerrero Trust Fund for Economic and Technical Cooperation (PGTF) to the Caribbean Council for Science and Technology (CCST) on behalf of the Global Water Partnership-Caribbean".

THE BASICS OF RAINWATER HARVESTING

Rainwater harvesting simply involves catching and storing rain where it falls — most often by saving the rainwater which flows

from a roof and down the drain pipes, diverting it through a filter in a storage tank for later use. Rainwater collection systems can be as simple as collecting rain in a barrel or as elaborate as harvesting rainwater into large plastic tanks or concrete cisterns to supply an entire household or work place demand.

Whatever system is used – the collected water must be covered properly with mesh or netting to prevent mosquitoes from breeding. This is extremely important to prevent the spread of diseases like dengue and chikungunya. If the water is to be used for drinking, it should be passed through a filter, an ultraviolet (UV) system, or it should be chlorinated.

THE FIRST-FLUSH MODEL (INNOVATION)

An important aim of the GWP-C's Rainwater Harvesting project was to promote measures to reduce the contamination of stored water by animal droppings and other debris from poorly maintained roofs. These corrective measures include first-flush diverter systems.

The first rains that wash the roof surface will often contain unwanted matter such as rodents' droppings, birds nests, leaves, dust and other debris, all of which can degrade the quality of the stored water should this "first-flush" enter the storage tank.

The first-flush diverter system is part of the downpipe that is configured to divert the initial roof water, so that debris does not enter the water storage tank. It works by channelling the first flow of water through the downpipe to its base where it encounters a cap with a small drain hole. This allows the first flow of water containing the roof debris to settle at the bottom of the downpipe, with the cleaner "later" water settling on top, permitting relatively clean water to enter the tank. The tanks are also fitted with filters to ensure a second cleansing of the water.



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SCHOOLS AS ECO-FRIENDLY AND EFFICIENT EMERGENCY SHELTERS

This is the design that was used by the National Institute of Higher Education Research, Science and Technology (NIHERST), in its partnership with the GWP-C to introduce rainwater harvesting technology to rural Trinidad with a focus on outfitting schools that had been designated as disaster shelters.

“Because of climate change, we need to be disaster prepared, the first thing to go in hurricanes is the water.”

- Lovaan Superville, Senior Project Officer, NIHERST

NIHERST outfitted 15 schools with the rainwater harvesting technology, and provided some of them with solar panels as a backup energy source. To ensure maintenance, they also trained residents in the areas of Toco, Moruga, and Barrackpore.

“The materials used to make the rainwater harvesters are easily available, easy to clean. It’s made out of local materials and so it is not expensive. Any plumber or electrician, once trained in how our system works, can easily duplicate them.”

- Lovaan Superville, Senior Project Officer, NIHERST

Interviews with the principals of some of the schools in Trinidad’s southeast communities of Moruga and Barrackpore confirm that

Case History: Toco Foundation

The Toco Foundation, a non-governmental organisation (NGO) based on the north-east coast of Trinidad, with funding from the Government’s Green Fund and in partnership with NIHERST and the GWP-C, is working to introduce rainwater harvesting systems in 50 households in 17 rural communities in north-east Trinidad, over a four year period, from 2012-2016.

The project educates participants in a full range of rainwater harvesting and small business skills to reduce unemployment and underemployment, including: rainwater

harvesting systems installation and practice, aquaculture, farming and soil conservation. An important part of the system introduced to participants is safe and hygienic water collection procedures using the GWP-C’s first-flush method.

The project aims to increase sustainability in rural communities in north-east Trinidad and encourages families, schools, community groups and others to create cooperatives in order to sustain the programmes for the next 10 - 15 years.

the rainwater harvesters have thus far been a success.

According to Benjamin Santoo, the principal of Rochard Douglas Presbyterian School, when the school cleans the tap water tank, it has four inches of slush. When we clean the rainwater tanks, there is no such problem.

“Water used to come once a month. We depended on water trucks to give us water Monday, Wednesday and Friday. Because of the school population, 500-plus, the water that we had was not enough for both drinking and flushing toilets.”

- Benjamin Santoo, Principal, Rochard Douglas Presbyterian School

In many instances, schools received pipe-borne water from the municipal supply only twice a week, sometimes less. With the installation of the rainwater harvesters, they have been able to save the pipe-borne water for drinking and use the rainwater for flushing toilets, watering gardens, and carrying out school projects.

If you would like to know more about rainwater harvesting, visit the GWP-C Rainwater Harvesting Toolbox at www.gwp-caribbean.org.



Contact GWP-C for more information at:

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