Rainwater Harvesting: A Common Sense Solution to Water Security

by Dr Christopher Cox, Acting Programme Director at the Caribbean Environmental Health Institute (CEHI)

The impact of global warming on our Caribbean climate is of increasing concern. Preliminary predictions emerging from experts in the field of climate observations and the Caribbean Community Climate Change Centre (CCCCC) suggest that rainfall patterns in the Caribbean will likely tend toward an overall 'drying trend' with declines in wet season rainfall, although dry season rainfall may be more moderate and actually tend toward increased rainfall amounts.

Experts generally agree that hurricane activity may increase, exposing the Caribbean region to untold adverse consequences. Post-hurricane situations are marked by water scarcity and extreme risk from the health and sanitation perspective. In this light our Caribbean communities must hasten the pace to incorporate appropriate adaptive measures to climate change in securing water supplies. Collecting and storing rainwater for later use is perhaps among our best 'standbys' for reducing our vulnerability to water scarcity in the face of climate change impacts.

Rainwater harvesting (RWH) is by no means new to the Caribbean. We practiced it for generations before pipe-borne supplies became widespread in our communities. In fact RWH continues to be a main source of water supply in many of the drier islands, notably the Grenadines, the Leeward and Virgin Islands, and the Bahamas.

However, the emerging trend in some of these islands is to move away from traditional RWH methods in favour of alternative technologies such as desalination and deep-well abstraction.

However these alternative technologies come at a higher cost and their sustainability depends on consumers' ability and willingness to pay for services. In many cases RWH has fallen out of favour due to the perception that the practice is 'outdated'. Where investments in such expensive water supply options are not viable, RWH remains an attractive option to meet shortfalls in supply.

Rainwater harvesting should be used to provide an additional measure of water security to householders, farmers, hospitals, schools, hotel and business operators. The technology can be easily incorporated into existing plumbing systems and hard surfaces (e.g. roofs) and used to capture and channel harvested water. RWH is of high value particularly following natural disasters (notably hurricanes), where water supply infrastructure may be damaged and remain out of commission for extended periods.

Applications of rainwater harvesting are not only limited to household and domestic purposes, but are also important to the agricultural and commercial sectors where rainwater can be used to offset heavy demands for non-potable (not for drinking) water. The high volumes of potable water that are used in a variety of manufacturing, washing/cleaning, watering (crops and livestock) processes can be augmented by rainwater, which can benefit production costs through reduced water utility bills, and assist in conserving water supplies in general.

The United Nations Environment Programme (UNEP) has embarked on a global initiative to promote the use of RWH and has implemented projects in Asia, Africa and the Pacific SIDS. The agency has extended the initiative to the Caribbean since 2005 partnering with the Caribbean Environmental Health Institute (CEHI) to engage in pilot RWH promotion activities.

In a first phase of the UNEP-CEHI collaboration, the tri-island state of mainland Grenada, Carriacou and Petite Martinique was chosen for a pilot initiative in the development of a National RWH Promotional Programme. The principle partners included the Grenada Ministry of Agriculture and the National Water and Sewerage Authority.

Significant destruction brought on by Hurricane Ivan in 2004 caused massive damage to the housing stock and commercial sectors, and disrupted water supplies in mainland Grenada for extended periods. On the other hand, water availability on Carriacou and Petite Martinique was not an issue following the hurricane as these islands utilise rainwater for all needs. In fact, Carriacou supplied mainland Grenada with water in the aftermath of the storm.

The Grenada RWH national programme provided the basis for development of a Regional RWH Programme for the Caribbean which seeks to replicate the national actions proposed for Grenada, in addition to actions best implemented at the regional level to facilitate coordination and harmonisation of approaches. The project also produced a suite of public education materials that included posters, brochures, a television feature and radio public service announcements.

A second phase of the UNEP-CEHI collaboration is underway and focuses on specific elements of the Caribbean Regional Strategy, but again at a local level with emphasis on development of best practices in RWH. In this case Antigua and Barbuda was selected as a demonstration country given the fact that it experiences high levels of water-scarcity, and that RWH is a well-established tradition among the populace. The principal local partner is the Antigua Public Utilities Authority (APUA)

A national symposium on Integrated Water Resources Management was held in January 2008 in which RWH water augmentation strategies were examined in the context of enhancement of water security in Antigua and Barbuda. Emphasis was also placed on health and sanitation practices related to rainwater harvesting. The symposium also sought to raise the profile of water resources management in the country.

Two field demonstration projects on RWH best practices are currently being established in north-west Antigua. One model is a lower-income household, and the other a small-scale commercial agro-processing enterprise. These demonstrations will feature retro-fitted roof capture, conveyance and storage facilities that are designed to optimally capture rainwater and safely store it. Of importance is ensuring that these RWH solutions are low-cost and easy to install.

To complement the demonstrations, a handbook on RWH best practices will be published for use by home and business owners, contractors and architects. Training seminars will also be organised for farmers, entrepreneurs, contractors and homeowners on configuration and installation/retro-fitting of appropriate RWH systems.

In St Lucia RWH demonstration is also being promoted under the aegis of the Global Environment Facility-funded Integrating Watershed and Coastal Areas (GEF-IWCAM) project with funding assistance from the European Union. In this initiative some 10 households and five community institution buildings in the Mabouya Valley, a severely water-stressed community on the island's east coast are being configured for RWH. It is expected that with expanded storage residents and community members will benefit from a more reliable supply particularly during the drier months of the year.