

# Climate Adaptation to Protect Human Health

## BARBADOS



### A Global Pilot

The climate change and human health adaptation project is a unique global initiative jointly implemented by WHO and UNDP. This novel project, piloted in seven countries, seeks to identify and share solutions to address health risks caused and exacerbated by climate change.

### Barbados Project Objective

To strengthen national adaptive capacity to address health issues related to climate change attributable water scarcity.

### Climate Change in Barbados

Barbados is the most easterly of the twelve small island developing states (SIDS) in the Caribbean Basin and enjoys a tropical, oceanic climate with no drastic changes in either seasonal or daily temperatures. The climate is classified as dry sub-humid with an average temperature of 26.8 °C. Seasons are classified as either wet or dry, with the wet season coinciding with the Atlantic hurricane season that runs from June till November. There is a distinct dry season from December to May. Barbados is located on the edge of the Atlantic storm zone, and as a consequence has been affected by tropical storms in recent years. Most climate models indicate that conditions will be warmer and dryer in the Caribbean, thus water availability and related health issues are of key concern.

### Key Health Concerns and Vulnerability

Barbados is already classified as a water scarce country. A further reduction in the availability of water, due to changes in precipitation patterns could lead to serious health impacts. Climate change is expected to affect the quantity and quality of available water. Previous projects concluded that sea level rise causing saline intrusion and changing weather patterns will adversely affect the water supply. With a limited water supply in the future there will be competition between various sectors with regards to the use of water.

Water scarcity can cause a variety of health problems, by reducing the amount of water available to practice basic hygiene and by increasing the risk of chemical and microbial contamination; these can lead to gastrointestinal diseases and other health risks. Treated wastewater will be needed for non-potable purposes in the future; this will require effective management of the resultant health risks.

Barbados has the highest rate of dengue fever in the Americas. Studies in the Caribbean show an association between climate variability and increasing incidence of dengue fever. Rainwater storage is being promoted as an adaptation option to increase availability of freshwater, however, environmental health officers report an increase in the *Aedes aegypti* index due to mosquito breeding in domestic rainwater storage tanks. To reduce the negative impacts on public health, there are requirements to improve storage facilities to eliminate vector breeding, provide technical guidelines with regards to the construction and maintenance of water tanks, and to increase public awareness with regards to effective and safe water storage.

### Project Structure

The Ministry of Health will be the lead organization and the project will be implemented with the close co-ordination of the Barbados Water Authority, the Ministry of Agriculture, and the Ministry of Environment. The national climate change committee will play a key supervisory role. UNDP and WHO will guide and supervise the project and provide overall technical guidance.

Barbados is one of seven countries taking part in this Global Pilot. The seven countries, Barbados, Bhutan, China, Fiji, Jordan, Kenya and Uzbekistan, together represent four distinct environments (Highlands, Small Islands, Arid Countries and Urban environments,) and their related health risks. For more information visit the website at [www.who.int/globalchange/projects/en](http://www.who.int/globalchange/projects/en)

### Project Facts

Donor: GEF Special Climate Change Fund (SCCF)

Funding: 550,000 USD

Time frame: 2010–2014

Location:

The whole island of Barbados

Key Stakeholders:

- ◆ Barbados Government Ministries
- ◆ Barbados Water Authority
- ◆ Town and Country Planning Department

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## Project Scope

This project will include two areas of action. The first will use treated wastewater to recharge an aquifer, while minimizing health impacts. The second will focus on using wastewater for irrigation, while ensuring no increase in adverse health outcomes. Results from the pilot projects will be used to develop water quality standards for the use of treated wastewater, policies and procedures to ensure adequate aquifer recharge and safe and effective use of wastewater for irrigation, and increase the proportion of the community who are aware of the need for the use of treated wastewater. These results will be achieved through addressing the following adaptive capacity issues:

- ◆ **Resources** - There is a lack of sufficient national capacity in terms of human and financial resources for incorporating climate change risks into health sector activities.
- ◆ **Governance** - There are a lack of guidelines and legislation for water storage. This means that any new storage facility that is developed does not take into consideration climate change and the related health impacts.
- ◆ **Waste water capacity** - There is also a lack of capacity with regards to wastewater reuse issues. Barbados has little experience with regards to utilizing wastewater for non-potable purposes or for aquifer recharge. Human and technological capacity can be improved in this area.
- ◆ **Communication and information** - There is a significant lack of information and therefore communication on climate change and its impacts in Barbados. This includes those in the health sector as well as the general public. Linked to this, there is a lack of understanding among the general public on climate change issues and how certain diseases, particularly dengue, are related to climate.

## Expected Benefits

The most substantial benefit expected to arise from this project is the reduced incidence of dengue fever while increasing water safety and availability.

Other significant benefits include:

- ◆ Improved coordination and cooperation between relevant governmental and nongovernmental organizations.
- ◆ Improved practices for the storage of rainwater, preventing the breeding of *Aedes aegypti*.
- ◆ Increased awareness of *A. aegypti* breeding sites in rainwater tanks as well as other potential breeding sites and the reduction of overall breeding opportunities.
- ◆ Enhanced level of public knowledge in relation to wastewater reuse.

## Project Outcomes and Outputs

**Outcome 1:** Policies and Programs are implemented to ensure health risks do not increase as a result of using treated wastewater to recharge aquifers and for irrigation.

1.1: Develop procedures and guidelines for the effective recharge of aquifers using wastewater.

1.2: Develop strategies, policies and procedures for the use of wastewater for irrigation, ensuring that the quality and safety of agriculture crops is assured.

1.3: Develop guidelines and standards for the safe use of wastewater.

1.4: Develop monitoring systems for using wastewater in agriculture and aquifer recharge.

**Outcome 2:** Public acceptance of the use of treated wastewater for non-potable use.

2.1: Social acceptance of the use of treated wastewater.

**Outcome 3:** Public safely stores water to prevent the breeding of *Aedes aegypti* mosquitoes.

3.1: Enhance current rainwater storage facilities for the prevention of the breeding of *Aedes aegypti* mosquito.