

Fresh water

Fresh water resources available to the Caribbean islands are considerably less than those available to other oceanic island groups. Fresh water resources between 1970 and 1998 were 2 574 m³ per capita, compared with 19 333 in the Indian Ocean and 149 505 in the South Pacific (World Resources 1998–99 database; data compiled from: Departement Hydrogeologie, Orléans, France; Institute of Geography, USSR National Academy of Sciences, 1997).

While all of the Caribbean islands are in the ‘tropics’, with respect to water resources the situation is as varied as the countries themselves. Several are very arid (Box 1.1) even though the region is generally considered to be relatively well endowed with precipitation. Aridity is usually present in specific regions or zones of the region’s larger countries. The varied geology, topography and size of the islands also influence the availability of water and patterns of water resource development.

Box 1.1: Barbados among the ten most arid countries of the world

Barbados has been classified by the World Health Organization as being in the top ten most arid countries in the world. As a consequence of this and other factors, including the 1993 and 1994 droughts, the Barbados Water Authority is pursuing the development of a Reverse Osmosis Desalination Plant to provide an additional four million gallons per day of potable water for distribution.

In addition to this, the Water Authority is conducting other measures to address the water problems in the island – including replacement of mains, some of which are over 100 years old, public awareness and education programmes, and the provision of water-saving devices free of charge to customers not in arrears. The structure of the Water Authority is being reviewed with a view to separating the operational and regulatory functions.

National water availabilities have been estimated by the World Resources Institute for a number of countries in the Caribbean (Figure 1.4).

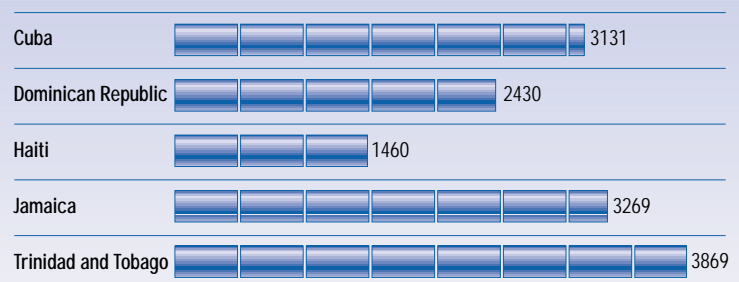
Some of the region's water supply systems date back to the nineteenth century. In Trinidad, the first public water supply system, the Maraval Waterworks, date from the 1850s, utilizing surface water, while Jamaica's first system, utilizing groundwater, dates from 1854, and in Barbados the date is 1850 and the source was a spring. In Cuba, the Albear Aqueduct, built in 1892, still serves some Havana City zones. The first water infrastructure, whether for domestic or agricultural use, was constructed on agricultural plantations, which were very large in some cases. Sugar plantations would also have been the first non-domestic consumers in the region and the forerunners of an industrial water supply. Later industrial fresh water systems were also used for home consumption around the mining, refining and oil and gas production centres, for example in Trinidad.

The growth of the tourism industry in the Caribbean has placed huge demands on the islands' water resources. However, a workshop on 'Water Resources Management in Small Island States', held in Barbados in August 1995, concluded that there were insufficient data to evaluate water resources for most of the Caribbean islands. Only the larger states (Cuba, Trinidad, Barbados and Jamaica) had the equivalent of a functioning Water Resources Agency.

The known facts about fresh water management in the Caribbean highlight a highly stressed environment.

- Many small islands have virtually no fresh water ecosystems (Virgin Islands, Netherlands Antilles, Barbados, etc.).
- Fresh ground water resources in many islands, especially the smaller islands, are being exhausted,

Figure 1.4: Fresh water availability for selected Caribbean countries (m³ per capita)



Sources: 1970–1998 World Resources Institute; 1980–1998 World Bank.

polluted or displaced by salt water intrusions.

- Polluted surface and ground water are major causes of degradation of coastal and near-shore marine ecosystems, including critical salt-pond, mangrove, estuary, sea grass and coral reef systems.
- Due to the lack of investment in the sector, in particular investment in maintenance, most water utilities in the region are unable to account for up to 50 per cent of total production.
- Increasing rates of deforestation are thought to be contributing to severe drought-and-flood cycles in most of the insular Caribbean during the annual dry and wet seasons.
- Tourism is a major consumer of water, with many resorts showing water consumption five or ten times higher than other residential areas.
- Expensive infrastructure such as the Roseau Dam in St. Lucia and a proliferation of desalination plants have been developed to provide fresh water to meet the increasing demands of agriculture, urbanization and tourism.
- Some attempts at agricultural diversification such as fruit and vegetable production require irrigation.
- Water recycling (such as the commercial use of grey water for irrigation) is uncommon.