2 CLIMATE OF THE EASTERN CARIBBEAN

The eastern Caribbean is located in the humid tropics but the rainfall is strongly influenced by topography. The intertropical convergence zone and to a lesser extent easterly waves, wave disturbances, or upper level troughs are the main weather systems that cause rainfall in the wet season. Convectional showers are the main forms of precipitation in the dry season. The wet season lasts between five and seven months from May or June, to November or December depending on location in the eastern Caribbean and on topography of the islands.

The islands of the eastern Caribbean can be divided into two topographical classes: flatter islands with low relief e.g. Antigua and Barbados, and hilly or mountainous islands to which most of the other islands belong. Dominica is the most mountainous.

The moisture laden northeast trade winds blow onto the islands from the east. These winds are forced to rise when they reach the mountains or mountain ranges on the islands. These rising winds result in condensation and precipitation or orographic rainfall. Consequently, there is increasing rainfall with elevation on the windward or eastern sides of the islands and a rainshadow effect and low precipitation on the leeward or western side. Leeward coasts can have quite low annual precipitation. Annual rainfall on the windward sides of the islands can vary from 1500-3500 mm depending on the island and on elevation. The leeward coast can have rainfall as low as 800 mm per annum. The range of rainfall on the leeward side of the islands can be 800-1200 mm per annum. The highest rainfall occurs at high elevation on the windward coast on the island of Dominica where rainfall can be as high as 7000 mm per annum. Rain falls almost every day and there can be several showers on some days.

The flatter islands of Antigua and Barbados have the lowest rainfall. The annual rainfall can vary generally from 750-1750 mm and the dry season can be prolonged.

Rainstorms in the Caribbean can be intense. It is not unusual to have storms of 50-100 mm per hour and a duration of more than one hour. Storms of greater intensities also occur. In some years, 50-70% of the annual rainfall may occur in 10-15 rainfall events. These rainstorms are very erosive and significant soil loss takes place.

Temperature and humidity vary with elevation and on the windward and leeward sides of the islands. Temperature decreases with elevation and with shade and is higher on the leeward side which does not benefit from the cooling effect of the moist northeast trade winds and precipitation as the windward side. There is also radiative cooling which can be high on cloudless nights giving rise to relatively low temperatures. Temperatures can therefore vary from a night time minimum of 18 - 20°C to a day time maximum of 34 or 35°C depending on location and elevation. The mean monthly minimum and maximum temperatures are 24°C and 29°C respectively.

Humidity varies from about 50-100% depending on rainfall, elevation and location on the island. The mean annual humidity is about 80%. The northeast trade winds, shelter, and temperature are the other factors which influence humidity.

On every island there are variations of the local climate which may be influenced by factors such as local wind circulation, slope aspect, and shelter. This results in variations in the local environment and ecology.