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Nicaragua

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NICARAGUA IS BOUNDED on all sides by water: to the east and west lie oceans, and most of the northern and southern borders are large rivers. Although the country has experienced growth in export processing and tourism, Nicaragua remains reliant on agriculture and fishing. The country experiences seasonal climate shifts, with pronounced wet and dry seasons. There is a tendency for flooding in the east and drought in the west. Knowledge about climate change mitigation is poorly developed within the country, in spite of vulnerability to natural disasters due to poverty, low investment in infrastructure, and poor interagency coordination. International nongovernmental organizations provide a large portion of disaster relief.

There has been a recorded increase in temperature of 1.2–1.8 degrees F (0.7–1.0 degrees C) across Central America over the past century. This generates concern over agricultural transition, since warming many increase crop pests and diseases. A drier climate may also increase risk of damage from forest fires. Malaria levels are likely to rise. There has been documentation of annual variation in Nicaragua of dengue/hemorrhagic dengue related to fluctuations in temperature, humidity, solar radiation, and rainfall.

Research suggests that hurricanes and tropical storms originating in the Atlantic Ocean may bring more rain as a result of increasing water temperatures. There is already a loss of more then 1 percent of the gross domestic product (GDP) annually in Nicaragua due to flooding. Regional studies suggest economic losses as a result of natural disasters are eight times greater now, as compared to the 1960s.

Hurricane Mitch struck Nicaragua in 1998. Its impact has been researched as a model for what could

occur from extreme weather events. In addition to the loss of 50 percent of GDP, major mudslides on the Las Casitas volcano led to the death of more than 2,000 people. There was also a documented increase in malaria, dengue fever, cholera, and leptospirosis. Conventional farms using chemical intensive monoculture had 60–80 percent more soil erosion, crop damage, and other water-caused losses from the hurricane than farms utilizing conservation practices such as polyculture, crop rotation, water conservation, terracing, and agroforestry.

Biodiversity reduction is a problem across Central America. Nicaragua has lost 50 percent of its forest cover in the last five decades. Research suggests an urgent need to reforest along the floodplains of rivers. Several forest conservation areas receive extensive foreign assistance, but marine reserves remain poorly protected. Mangrove swamps and coral reefs are particularly at risk.

Nicaragua ratified the Convention on Climate Change in 1995 and the Kyoto Protocol in 1999. Geothermal energy production is part of a national plan to combat climate change. New geothermal projects are under construction, with funding from the United Nations's Clean Development Mechanism (CDM). Other CDM projects utilize biodigesters and bagasse cogeneration to transform waste products from sugarcane processing into energy. In addition to rectifying low energy efficiency, Nicaragua needs to improve provision. About 20 percent of annual deforestation comes from fuel wood extraction.

SEE ALSO: Clean Development Mechanism; Deforestation; Floods; Hurricanes and Typhoons.

BIBLIOGRAPHY. Clean Development Mechanism, www.cdm.unfccc.int/index.html (cited June 2007); Walter Vergara, *Adapting to Climate Change* (World Bank, 2005).

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