

# Climate Change in Corn Fields of the Coastal Region of Ecuador

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**Abstract**

The Ecuadorian coast has two different climate regions. One is humid region where the annual rainfall is above 2000 mm and rain falls in almost all months of the year, and the other is dry region where the annual rainfall can fall below 50 mm and rainfall can be very seasonal. The agriculture is frequently limited by the seasons during the year and the availability of rainfall amounts. The corn fields in Ecuador are cultivated during the rainy season, due to this reason. The weather conditions for optimum development of corn growth require a monthly average rainfall of 120 mm to 140 mm and a temperature range of 22°C~32°C for the dry region, and a monthly average rainfall of 200 mm to 400 mm and a temperature range of 25°C~30°C for the humid area. The objective of this study is to predict how the weather conditions are going to change in corn fields of the coastal region of Ecuador in the future decades. For this purpose, this study selected six General Circulation Models (GCM) including BCC-CSM1-1, IPSL-CM5A-MR, MIROC5, MIROC-ESM, MIROC-ESM-CHEM, MRIC-CGC3 with different climate scenarios of the RCP 4.5, RCP 6.0, and RCP 8.5, and applied for the period from 2011 to 2100. The climate variables information was obtained from the INAMHI (National Institute of Meteorology and Hydrology) in Ecuador for the a base line period from 1986 to 2012. The results indicates that two regions would experience significant changes in rainfall and temperature compared to the historical data. In the case of temperature, an increment of 1°C~1.2°C in 2025s, 1.6°C~2.2°C in 2055s, 2.1°C~3.5°C in 2085s were obtained from the dry region while less increment were shown from the humid region with having an increment of 1°C in 2025s, 1.4°C~1.8°C in 2055s, 1.9°C~3.2°C in 2085s. Significant changes in rainfall are also projected. The rainfall projections showed an increment of 8%~11% in 2025s, 21%~33% in 2055s, and 34%~70% in 2085s for the dry region, and an increment of 2%~10%, 14%~30% and 23%~57% in 2025s, 2055s and 2085s decade respectively for humid region.

**Keywords:** Climate change, Corn fields, GCM, Ecuador

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