

# BRAZIL - South America's Agro-Power Heats Up

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*IPS - Brazil, one of the world's agricultural superpowers, will see changes in the map of its emblematic crops, like coffee and soybeans, as a result of global climate change, say the latest studies.*

Even the most optimistic scenarios outlined in the studies by the Intergovernmental Panel on Climate Change (IPCC) predict that the thermometer will keep rising and will alter the rainfall patterns over much of South America.

Agro-meteorological researcher Moacir Ant- nio Berlato, from the agronomy department at the Federal University of Rio Grande do Sul, says various studies have already shown that warming is affecting farming practices across the south-eastern region of the South American continent.

Although "in Brazil we are still lacking field studies to better understand the problem," he adds.

The government's agricultural research agency, Embrapa, conducted simulations with data from the IPCC to predict the impact of climate change on five crops: soybeans, maize, coffee, rice and beans.

The results of scenarios with temperature increases of 1.3 to 5.8 degrees Celsius and five, 10 and 15 percent increases in rainfall revealed the need for a dramatic geographical reorganisation of the country's agricultural production.

In the coming decades, grain crops will be increasingly difficult to grow in southern Brazil, while perennials like coffee will tend to prefer zones with more moderate temperatures, which means the centre of production could shift to the south, according to an Embrapa study.

Excessive heat in the southern hemisphere summer will likely push production of crops like rice, beans, maize and soy towards Brazil's central-west.

"Warming is already causing extreme weather events in the south, like more intense summers and heavy rains. To a lesser degree, the same is happening in the central-east and south-east, Eduardo Assad, Embrapa's information technology chief and head of the climate model study, said in an interview for this report.

In function of these changes, Embrapa is working to disseminate information on actions to mitigate the impacts of climate change, caused by the accumulation in the atmosphere of so-called greenhouse gases — the sharp increase of recent decades the result of human activities.

In this way they hope to promote integration of farming and livestock, the agro-forestry systems that combine pastures and forest, and expanding direct planting, a cultivation technique that doesn't disturb the topsoil and, according to Assad, can capture up to 500 kg per year per hectare of carbon, the principal greenhouse gas.

In Brazil, with 23 million hectares cultivated using direct planting techniques, this could represent 12 million tonnes of carbon captured from the atmosphere each year.

"Farmers should be concerned about global warming and adopt practices to reduce carbon emissions in exchange for remuneration for these environmental services, as already occurs in (the southern U.S. state of) Texas and in Canada, where farmers are paid for direct planting," Assad said.

Another focus of Embrapa are measures to adapt agriculture to climate change by genetically improving crop varieties to make them resistant to the stresses of drought and higher temperatures.

In late June, the Ministry of Agriculture will announce zoning for the 2007-2008 growing season, with restrictions on crops in the southern state of Rio Grande do Sul. "Crops will be limited in 68 municipalities along the south and eastern borders, which have soils with a clay factor of between 15 and 35 percent," said ministry official Francisco Mitidieri.

The ministry does not say global warming is the reason behind the restrictions, but rather the historic climate trends. These government-led limits in the far south began in 2005 when planting of soybeans was restricted for the first time, citing sandy Rio Grande soils that retain less water.

Furthermore, the Ministry of Agriculture aims to provide new crop choices for Rio Grande do Sul farmers, the hardest hit by climate change in Brazil. For the first time the region will be zoned for growing sunflowers, rapeseed and temperate climate fruits like plums, peaches, nectarines and pears.

The daily minimum temperatures are on the rise in the southeast of South America, extending across southern Brazil, Paraguay, Uruguay and north-eastern Argentina.

Climate data from 1960 to 2000 reveal a significant increase in the proportion of warm nights and a trend towards fewer cold nights, especially in the southern hemisphere summer (December through February) and autumn (March through May) with the most notable changes along the Atlantic coast.

In Rio Grande do Sul, was a 1.4-degree Celsius decline in the average daily low temperature between 1913 and 1998, said university researcher Berlato. The data show more heat waves and more warm nights, and fewer days with severe frost. Annual precipitation has increased in recent years by an annual average of 6.2 millimetres across the state, he said.

The number of consecutive days without rain has decreased, and the days with continuous rain has increased in all seasons, but especially in the autumn, which is a problem for grain crops, which at that time of year are in the final stages of maturation and ready for harvest.

Nevertheless, "this could be good for agriculture," says Berlato.

Furthermore, the frequency of intense rains (more than 20 mm) and "very intense" rains (more than 50 mm) is also on the rise.

There are also clear indications of temperature and precipitation alterations in the neighbouring state of Santa Catarina.

Analysis of data from 40 to 70 years ago shows that these are not temporary phenomena, or part of a natural cycle, but rather are linked to the intensive exploitation of natural resources and use of fossil fuels, as well as changes in soil use, according to the state's Centre for Information on Environmental Resources and Hydrometeorology.

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This story is part of a series of features on sustainable development by IPS - Inter Press Service, and IFEJ — the International Federation of Environmental Journalists.

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