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Climate Change Has Adverse Impact on Mexico's Agriculture Sector

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Global climate change is expected to have a dramatic impact on Mexican agriculture, including the possibility that agriculture production could become non-existent in a region of northern Mexico that has faced a series of droughts. In other areas of the country, agriculture production could become more uncertain, as droughts and excessive moisture, due to a warming of the atmosphere, result in dramatic fluctuations in output.

An indirect impact is the rush in the US and Europe to promote production of corn-based ethanol, which could prompt producers in Mexico to abandon traditional crops like agave in favor of corn, which is rapidly becoming a high-revenue crop.

Tequila industry faces oversupply of agave cactus

The warming of the global climate could have an unexpected negative impact on production of agave and the tequila industry in the near future. Warmer temperatures in western Mexico may cause agave plants to mature at a faster rate than originally projected, which could translate into an oversupply of agave, said the Consejo Regulador del Tequila (CRT). "This could greatly increase inventories at a time when the industry is not expanding its processing capacity," said the CRT's certification director Ismael Vicente.

Vicente said the tequila industry used about 788,000 metric tons of agave in 2006, or somewhere between 28 million and 32 million plants. With plants maturing at a faster rate than anticipated, producers will have about 80 million plants to harvest in 2008, leaving about 48 million plants without a market. "The excess would represent 120% of what the tequila industry currently consumes," said the CRT official.

"We have to diversify our industry in the very short term," said Vicente. "The agave plant has more than 100 uses, and we are basically focusing on one use: tequila production." He said the industry should put more emphasis on manufacturing such products as syrups, sweeteners, food additives and fibers.

The oversupply situation will not only depress prices in the near term, but could have negative supply repercussions over the longer term. "If the agave producer sees that his crop is not being purchased, he will stop planting," said Vicente. "And when we have exhausted our current harvest, we may find ourselves with a tight supply of raw material to produce tequila."

Corn a more lucrative crop

Other CRT officials predict that roughly one-fourth of agave producers could abandon that crop in favor of higher-priced corn, which has benefited from the surge in demand for ethanol in the US, Europe and even at home in Mexico. Earlier this year, the Chamber of Deputies approved legislation

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to require cleaner-burning ethanol to oxygenate gasoline in Mexico's three largest metropolitan areas: Mexico City, Monterrey, and Guadalajara (See SourceMex, 2007-06-07).

The situation facing the tequila industry is repeated in other parts of the world. For example, the Associated Press reported that brewers in Germany are worried that high corn prices have prompted European farmers to opt for that commodity at the expense of barley, hops and other products used to produce beer. The shortage of those products could result in an increase in beer prices in Germany, said the report. The shift to corn could reduce production of many other crops in Mexico, including beans, potatoes, rice, and barley.

The Confederacion Nacional de Productores de Maiz (CNPM) estimates that corn production could increase to about 24 million MT this year, due to increased plantings of both white and yellow corn. White corn is used for production of tortillas and other foodstuffs, while the yellow variety is used for industrial purposes, including ethanol. Production of all varieties of corn averaged 19 million MT annually between 1996 and 2005, according to the Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca y Alimentacion (SAGARPA). "There is a lot of enthusiasm for corn across the country," says CNPM secretary general Carlos Salazar.

Even with the increased production, Mexico has to import white corn from the US, South Africa and Mozambique to ensure adequate supply and stable prices. According to the CNPM, imports of white corn totaled 337,000 MT in the first half of 2007, compared with 80,000 MT in the same six-month period in 2005. The surge in the costs of corn and tortillas earlier this year prompted protests around the country and led the Calderon administration to negotiate a pact with the tortilla industry and retailers to keep prices down (see SourceMex, 2007-01-10, 2007-01-31 and 2007-05-02).

Salazar said President Felipe Calderon is pushing for producers to include white corn in their increased area, not just yellow corn. Still, critics say Mexico should not cave in to the interests of the US and Europe, which could result in the shift of millions of hectares to corn and sugar cane to "feed automobiles." "In the rush to promote biofuels as a 'solution' to global warming, developed countries are pushing for an increase in the surface destined to the cultivation of grains and oilseeds," said the Mexico City daily newspaper La Jornada.

The newspaper said the European Union (EU) and the US don't have sufficient land within their own borders to grow the amount of corn or other crops needed to meet projected demand for ethanol and will have to rely on overseas production. The EU wants to ensure in the short term that 13% of its fuel usage is made up of bioethanol and biodiesel, but most of the raw material for this conversion will have to come from overseas. "They are well aware that their own lands can produce only 30% of the required needs," said La Jornada.

The situation is similar in the US, which "knows that the surface destined toward corn is insufficient to satisfy current demand [for ethanol]," said the newspaper.

Permanent drought forecast for northern Mexico

While Mexican farmers shift emphasis to producing crops for the biofuels industry, one region of the country may not be able to produce much of anything at all in the long term. According to

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a new study published by Lamont-Doherty Earth Observatory, a member of The Earth Institute at Columbia University, a big region that includes a large portion of northern Mexico and southwestern US, will experience a major drought as a result of global climate change. According to the study, annual rainfall in the region will have declined by as much as 20% by the end of the century.

Northern Mexico has suffered a serious of droughts over the past two decades, some of which have caused significant reduction in agriculture production (SourceMex, 1995-06-14, 1996-06-12, 1998-08-05, and 1999-03-03). Researchers predict that the pattern of dryness will become permanent in the region. "The arid lands of southwestern North America will imminently become even more arid as a result of human-induced climate change just at the time that population growth is increasing demand for water, most of which is still used by agriculture," said Richard Seager, senior research scientist at the Lamont-Doherty Earth Observatory and one of the lead authors of the study.

The prediction of drier conditions in northern Mexico and the southwestern US was based on a study of 19 climate computer models assembled for the Intergovernmental Panel on Climate Change, the international scientific effort to assess the impact of global warming. Sixteen of the 19 computer models projected the dry conditions in northern Mexico and the southwestern US, while forecasting more rain outside the region. "It's a situation of the poor getting poorer and the rich getting richer when it comes to rainfall," said Yochanan Kushnir of the Lamont-Doherty Earth Observatory of Columbia University, one of the paper's authors. "From a climate perspective, these changes are quite dramatic."

Government urged to develop strategy for agriculture

The Calderon administration's recently released national development plan (Plan Nacional de Desarrollo) proposes some steps to help ease the impact of global climate change. The study, which recognizes that Mexico ranks among the 15 major producers of carbon dioxide (CO2), proposes a series of steps to help address global climate change.

In the plan, the government pledges to develop a plan to reduce greenhouse emissions, reverse deforestation, and promote more efficient and cleaner technologies. The issue of deforestation is important to Mexico, which ranks among the countries with the highest loss of wooded areas (see SourceMex, 2007-03-21). The Secretaria del Medio Ambiente y Recursos Naturales (SEMARNAT) has begun discussions with the UN's Food and Agriculture Organization on a plan to develop a strategy to reverse the loss of woodlands.

Critics say, however, that the Calderon administration's plan deals with long-term solutions, not on proposals for the short and medium term. Furthermore, they said, the administration has released few specifics on how Mexico is going to deal with the impact of global climate change on its own agriculture sector. Arturo Osornio, secretary for agriculture development in Mexico state, said state officials and producer organizations would have to pressure the government to spell out a policy. "That is all that we are asking," said Osornio. "This decision is the domain of the federal government."

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Some farmers in Mexico state have started to consider alternative operations, including hydroponics and production of organic fruits and vegetables, to deal with the loss of traditional agriculture. Hydroponics is a technology for growing plants in nutrient solutions (water containing fertilizers), with or without the use of an artificial medium like sand or vermiculite. "In combination with greenhouses, it is high technology and capital-intensive," said Merle H. Jansen, professor of Plant Sciences at the University of Arizona. "It is also highly productive, conservative of water and land, and protective of the environment."

Agriculture officials in Mexico state acknowledge that it will be a challenge to convince farmers to change their habits. "Only about one-fourth of the area we have devoted in the state to vegetables makes use of hydroponics," said Jaime Segura, Mexico state's agriculture director. Segura said the government is offering subsidies of up to 50% for producers who decide to set up hydroponics operations. At present, this agricultural method is used primarily to grow tomatoes and flowers. He said the method is prevalent in the flower corridor, near the Tenango zone, in the southern areas of Mexico state.

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