

NAFTA and Conservation of Maize Diversity in Mexico

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The effects of the North American Free Trade Agreement (NAFTA) on the Mexican maize sector and the conservation of maize diversity have been subjects of much debate. This paper first reviews the commitment to liberalize the North American maize market, the actual policies undertaken to this effect, and the evolution of maize output, imports and consumption in Mexico. It then outlines the controversy surrounding the effects of NAFTA on the conservation of maize diversity in Mexico, discussing two perceived threats to *in situ* conservation of maize in Mexico: the extinction of subsistence maize agriculture and the spread of maize transgenes.

NAFTA and Internal Agricultural Reform in Mexico

It is hard to distinguish NAFTA's effects on Mexico's maize sector from those attributable to concurrent internal reforms and the macroeconomic instability experienced in Mexico from 1994 to 1996. From the mid-1930s to the early 1990s, Mexico's grain sector was supported through the government's Conasupo program. In 1999, Conasupo was dismantled and government involvement in the maize sector has been reduced to the retail sale of maize through the Diconsa network, the allocation of maize imports, and the Kilo-por-kilo program. NAFTA signaled an end to barriers to Canadian and American maize imports, liberalizing maize seed imports in 1994, while subjecting other maize to gradual liberalization scheduled to be completed by 2008.

Macroeconomic models of liberalization consistently predicted a sharp increase in maize imports and a sizeable reduction in the Mexican maize sector. Following NAFTA's coming into force, maize imports increased as predicted, but surprisingly, domestic maize production also increased, particularly in rain-fed maize areas through increases in area. In contrast, the supply of maize from irrigated areas remained constant through an increase in productivity. Ongoing statistical analysis has not identified significant variations in the trend of Mexican maize imports during the last 20 years, implying that factors other than NAFTA have influenced the variation in maize imports, such as changes in the exchange rate, the domestic demand for maize, or agricultural pricing policies.

In comparison to the three years prior to NAFTA, the domestic price of maize since NAFTA has followed the downward trend of international prices. Despite this trend, movements in domestic prices were experienced from 1995 to 1996 due to changes in the real exchange rate. These exchange rate fluctuations help to explain the sharp changes in governmental intervention in the maize market during the period in which NAFTA has been in effect.

Conservation of Maize Diversity in Mexico

It was expected that NAFTA and internal agricultural reform would curb subsistence maize agriculture in Mexico (a center of maize origin and diversification), thus threatening *in situ* conservation of Mexican maize land races. However, the paper proposes that maize agriculture in Mexico has not been curbed as expected. In fact, early evidence suggests that price changes may have contributed to the conversion of commercial maize agriculture into a subsistence practice in some regions, thereby conserving local maize diversity. Despite this evidence, some critics believe that NAFTA remains a threat to maize conservation in Mexico, while others refute this argument. As the paper discusses, the debate lies on alternative microeconomic interpretations of farmers' responses to price changes. One hypothesis posits that although rain-fed-maize farmers

have not yet experienced price changes due to their isolation from the market, they will cease their production if prices continue to fall. The other holds that the rain-fed maize sector has already restructured in response to price changes, and that subsistence farmers will continue growing maize despite further price decreases.

Still other concerns for the diversity of Mexico's maize crop arise from the introduction of maize transgenes from the US, emphasizing the need for an *in situ* conservation program. The paper suggests that costs are a fundamental aspect of *in situ* conservation since it was considered economically infeasible for many years. The cost of conserving land races depends on the efficiency of a conservation strategy, which in turn is contingent upon the research to support it. The paper suggests there is no need to permanently subsidize traditional agriculture as an umbrella for conservation. Instead, it is more efficient to address specific threats to conservation individually, thereby allowing limited but specific responses to these threats.

The establishment of a monitoring and research program is required to detect and respond to threats to the conservation of maize diversity and, by extension, to reduce the costs of crop genetic resource conservation *in situ*. A monitoring program should identify changes in the status quo of land race management by detecting long-term processes—such as cultural change and land consolidation—but also more rapid developments such as the spread of transgenes. Additional areas for research include the influence of culture change and loss of indigenous values, as well as changes in land tenure following the amendments of Article 27 of the Mexican Constitution.

The National Survey of Rural Households in Mexico (ENHRUM) recently gathered countrywide information on the economy of Mexican families. The survey generated extensive information on local and regional maize markets, as well as a wealth of information on the management of maize in rural homes and the extent of maize seed networks across the nation. In association with researchers in the University of California and *El Colegio de la Frontera Sur*, ENHRUM also collected a nationally representative maize sample. This is the head start for a conservation program for Mexican maize.