Maize Trade Disruption Could Have Global Ramifications

Analyzing the maize trade among 217 nations suggests that if U.S. maize exports are disrupted due to environmental or other factors, supplies and food security in many nations could be jeopardized due to the bilateral nature of trade patterns.

Washington, D.C. – New research on the global maize (corn) trade suggests that any disruptions to U.S. exports could pose food security risks for many U.S. trade partners due to the lack of trade among other producing and importing nations. The study, while not primarily focused on plant disease, population growth, climate change or the diversion of corn to non-food uses such as ethanol, suggests that significant stresses in these areas could jeopardize food security. This is particularly true of nations like Mexico, Japan and the Republic of Korea that have yet to diversify their sources.

Maize is at the center of global food security as increasing demands for meat, fuel uses, and cereal crop demands increase the grain’s pivotal importance in diets worldwide. It is used as a basic raw material in producing starch, oil, protein, alcohol, food sweeteners and as a dietary staple. Disruptions in any one major exporter’s supplies could lead to price shocks. The centrality of maize means that it would become a critical food security risk if major exporters experience disruptions due to non-food diversions, plant diseases and climate impacts, according to the article.

The researchers studied trade patterns from 2000-2009 and determined that the U.S. is by far the largest exporter, exporting four times as much maize as Argentina, the next largest exporter. Drs. Felicia Wu of Michigan State University and Hasan Guclu of the University of Pittsburgh use network models — essentially, food trade maps — to track the movement of maize in their article “Global Maize Trade and Food Security: Implications from a Social Network Model.” The research was supported by the National Institutes of Health and the article was recently published electronically in the journal *Risk Analysis*, published by the Society for Risk Analysis.

The researchers based their work on United Nations Commodity Trade data and developed a social network model of maize exports and imports to study how “clustering” in trade patterns may affect food security. The clustering shows that nations generally do not trade broadly worldwide. Nations that import maize primarily from only one other nation may be vulnerable to any changes in their exporters’ ability to produce and ship maize. “These statistics show that the vast majority of nations are exporting to or importing from only one or a small number of nations,” they conclude. They also note that Japan is the largest importer by far, while other nations such as Taiwan and Egypt have more broadly diversified their sources of maize, thereby reducing their vulnerability to export disruptions.
The researchers are careful to point out that their work is descriptive and cannot predict what risks will actually be or if they might lead to disruptions. The article suggests that the largest maize producers may be wise to consider potential solutions to combat impacts of climate change on maize production for the purpose of maintaining supplies. Finally, they add that if the maize supply were to change from a global perspective for whatever reason, other cereal grains or legumes could fill gaps, softening the impacts of disrupted maize production and trade.

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