

Agricultural Trade and Climate Change

Can the WTO Promote Resilience in the Face of Uncertainty?

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The focus of the climate change debate has recently shifted away from simple cost-benefit analysis toward identifying the efforts that must be made to ensure that the least advantaged members of society do not face disproportionate costs. Recent economic models have concluded that a country's capacity to adjust to these physical changes will determine ultimate economic impacts, and thus developing countries that are less resilient and flexible may suffer disproportionately. The uncertainty surrounding the issue and the ability of developing countries to adjust to potential shifts on agricultural production have important consequences for global trade and, by extension, for the multilateral debates within the World Trade Organization (WTO).

What are the institutional implications for the WTO in the face of future shifting patterns of agri-food production and trade, in the short-, medium-, and long-term? After briefly describing recent research insights into distributional impacts of climate change, the article first considers current negotiations and how the architecture of various proposals may address the need for flexibility in developing countries. The WTO dispute system may address the possibility of an escalating conflict spurred by climate changes during the transition to new social and environmental equilibria, but it remains to be seen whether countries participating in the current Doha Round are focusing on goals that anticipate the eventual long-

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run outcome of climate change.

The question for the WTO is two-fold. First, it is worthwhile to take a look at how shifts in production patterns will affect trade relationships and current WTO negotiations. Second, the extent to which the WTO can provide a system that will encourage resilience and flexibility for WTO members against the distributional consequences of climate change must be considered.

Climate Change and Agricultural Trade Patterns.

Climate change modeling has provided insights into the potential distribution of physical impacts of climate change, particularly in the area of agricultural production.¹ On a global scale, agriculture will be directly hit by shifts in temperature and precipitation patterns and will be forced to absorb some of the costs associated with climate change and declining levels of freshwater available for crop irrigation. Scientists predict that while the interiors of major continents will warm more quickly than the oceans, the weather extremes are likely to be exacerbated in the long run.

But how will the impact of climate change on agricultural production differ between the developed and developing world? A recent study by the Center for Global Development (CGD), based on detailed modeling of the distribution of impacts of climate change on agricultural productivity, indicates that the developing world is likely to experience, on average, a greater decrease in agricultural productivity.² For example, the CGD model estimates that by 2080 wealthy countries could experience a 6 percent decrease in agricultural output, whereas developing countries could experience a 21 percent decrease. The geophysical aspects of developing countries largely

explain these sharp discrepancies; most of these nations are near the equator and therefore will be significantly affected by higher temperature levels and consequent declines in agricultural productivity. In addition, many of these countries have low capacities to respond flexibly to rapidly changing conditions. The CGD study also notes that because agriculture contributes a larger percentage of national GDP for developing nations, the decline in agricultural productivity will disproportionately affect these nations over their industrialized counterparts. The primary areas of concern are sub-Saharan Africa and other commodities-based economies, where climate shifts could place millions of people at a greater risk of poverty and hunger.

The impact of climate change and declining agricultural productivity on trade patterns will be varied and will depend heavily on how well a nation is integrated into the global agricultural trade system. Currently, five wealthy, non-equatorial regions account for more than 80 percent of the world's exports of wheat, corn, soybeans, beef, pork, and poultry: Argentina and Brazil, Russia and the former Soviet Republics, the EU, Australia and New Zealand, and the United States and Canada.³ Although most of these regions will experience the negative results of climate change, they are not the most vulnerable.

Other researchers highlight the fact that unique geophysical characteristics of particular regions will determine their physical vulnerability to changing climates. In a recent *Scientific American* article, Jeffrey Sachs notes that while global impacts will vary widely, four primary zones of concern should be monitored: low-lying coastal settlements, farm regions that depend upon rivers fed by

glacier melt, arid regions which are likely to experience greater drought frequency, and humid areas in Southeast Asia, which are vulnerable to shifts in monsoon patterns.⁴

The effects of climate change, of course, will not be confined to a particular area. Rather, environmental productivity and socio-economic impacts may spill over political boundaries. Sachs points out that some areas have the means and the resources to shift their production to new economic activities in case of

Canada have encouraged a Mountain Pine Beetle epidemic that caused widespread mortality in lodgepole pine forests, the province's most abundant commercial tree species. At the current rate of growth, 50 percent of the mature pine will be gone by 2008, and 80 percent by 2013. The consequences will alter ecosystems and the forestry industry in British Columbia for decades.⁵ Ultimately, there is an alleged dangerous compounding risk associated with climate change. At a potential threshold

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an agricultural production crisis. Other regions will be unable to adjust and will be more likely to move to new areas in search of economically viable alternatives to their traditional agricultural roles. New migration movements will undoubtedly constrain various governments and economies. These changes will alter agricultural productivity and competitiveness in the global trade system.

Most current modeling scenarios consider changing weather patterns, temperatures and water availability, and their respective impacts on overall agricultural productivity. Climate change will, however, also have important effects on the distribution of agricultural production by altering habitats, behavioral patterns, and the relative competitiveness of pests and diseases. Increasing temperatures may allow populations of pests, which usually do not survive the winters in certain colder regions, to disrupt certain ecological and agricultural patterns. For example, milder winters in northwest

level, a species can become altogether extinct and hence lead to other irreversible ecological changes. At the same time, specific changes will be very difficult to predict. Most models have not incorporated these types of uncertainties into their projections.

Providing Flexibility for Vulnerable Groups. The current round of trade negotiations at the WTO seeks to reduce market distortions in the area of agricultural trade, in part through the reduction of bound agricultural duties. WTO members agreed at the end of the Uruguay Round to bind their agricultural duties so that tariffs on individual items would not exceed a specified level. Nevertheless, many countries still have substantial room between the duties that they apply and those defined by their WTO commitments. Depending upon the ambition and resilience of the Doha Round, the reduction in bound tariff rates may not imply a reduction in a

country's applied duties. A reduction in bound duties, however, would offer exporting countries some predictability with respect to future market access conditions. In addition, the room between bound and applied tariff rates provides some flexibility, or "policy space," for importing countries concerned about the uncertain, future socio-economic conditions.

Thirteen negotiating groups are actively engaged within the current WTO negotiations on agriculture. Recent negotiations have specifically identified three categories—least developed countries (LDCs), small and vulnerable economies (SVEs), and recently acceded members (RAMs)—that may warrant more flexible treatment, particularly under the market access negotiations in agriculture.⁶ Current negotiation proposals include a set of flexibilities for these groups of countries that will address their diverse concerns with respect to market access. For example, LDCs would not be required to undertake reductions in bound duties, and both RAMs and SVEs would, under certain conditions, be able to moderate cuts to agricultural bound tariffs. One component of this set of flexibilities for developing countries, the Special Safeguard Mechanism, could be particularly useful to developing countries dealing with import surges or price declines that might result from unexpected and extreme climatic events.

There is an overlap between the groups of countries targeted for more flexible treatment under the current WTO negotiations and the groups that climate change models have identified as likely to bear disproportionate costs from climate change. For example, 25 out of 32 LDCs who are WTO members are African countries and, as noted above,

may be more susceptible to negative productivity impacts of climate change. The flexible treatment of LDCs would exempt them from undertaking potentially burdensome policy changes, such as tariff reductions that could likely decrease tariff revenue and public expenditures.

The potential "flexibilities" given to the group of SVEs would arm these small island states—that are vulnerable to be particularly damaged by the impacts of climate change—with additional policy space. These provisions, which allow developing countries to adjust their policies in the face of shifting productivity and economic competitiveness, may ultimately provide the short-term political solution that is necessary for developing countries to accept negotiated outcomes in agriculture. Since market access policies, however, create market rigidity and influence the distribution of resources within economies, there is the concern that avoiding disciplines in this area could inhibit resilience in the long run.

Managing Conflict During Transition. Arguably, conflicts are more likely to result in situations where rapid change leads to the erosion of underlying common interests and disintegration of existing allegiances. Agricultural policies, such as tariffs and subsidies, represent policymakers' responses to domestic interests and historical trade relationships. For example, trade relationships between African countries and Europe have been fundamentally influenced by colonialism and its legacy. Existing agricultural production patterns continue to reflect trade arrangements that provide preferential access to European markets for African exporters. Although preferential arrangements shift over time, producer groups reluctant to lose this type of

competitive advantage will invest resources in order to buffer against potential economic costs. These types of agricultural policies, therefore, are less likely to shift abruptly as a result of climate change. While producers that experience deterioration of their competitive position may increase their demand for protectionist policies, one would not expect a sharp increase in *new* protectionist policies justified by climate change in the *medium* term.

On the other hand, shifts in climate may very well lead to increased conflict in the area of sanitary and phytosanitary (SPS) measures, which are used by countries to address potential food safety and animal and plant health risks. These measurements are important in light of the ecological impacts associated with insects and pests. Consider, for example, an African country in which many poor farmers cultivate cassava and depend upon the crop for as much as 50 percent of their calorie intake.⁷ In the past, many African countries suffered declines in cassava production due to the inadvertent introduction of the cassava mealybug from Latin America. Fortunately, the infestation was ultimately brought under control through the introduction of an insect predator.

Climate change could destabilize this predator-prey equilibrium in two main ways. First, climate change may create conditions that allow species to thrive in places where previously they could not survive. Second, through its direct impact on predator-prey relationships, climate change could permanently alter the ecosystem. If, for example, current predators of the cassava mealybug are less able to withstand increasing temperatures and water scarcity than their prey could, the consequent explosion in the cassava

mealybug population growth will have a direct, detrimental impact on agricultural productivity. In response, African countries that have already suffered production losses due to the influx of invasive species may be more inclined to implement immediate measures to address the potential risks of pests.

Under the WTO's Sanitary and Phytosanitary (SPS) Agreement, WTO members can implement emergency measures as a temporary response to a disease or pest outbreak within an exporting country. Since this type of urgent response is typically not subject to a lengthy comment or consultation period, these activities can be an effective mechanism to quickly block trade in the face of an increased risk. Furthermore, in light of risks and uncertainty about a pest threat, countries could become temporarily more risk-averse and inadvertently increase the frequency of emergency trade restrictions. If trade partners disagree over the extent to which risk has increased and exporting countries suspect a protectionist motivation for these blunt trade restrictions, countries will need additional mechanisms to solve and address these concerns. The WTO must provide such mechanisms to deter potential conflicts between trade nations.

Since pursuing formal dispute proceedings requires significant resource investment, developing countries may benefit from alternative approaches to resolve their trade conflicts. Informal processes to address trade concerns are typically more cost-effective in terms of both time and financial resources. The WTO has many routine monitoring, surveillance, and enforcement mechanisms. Within the SPS committee, members' SPS measures are subject to peer review. These peer review mechanisms

contribute to improved adherence by all members to rules, disciplines, and commitments made under the WTO agreements. The delays between data provision and measure implementation could be directly relevant to how well transparency works. Further efforts to strengthen monitoring and surveillance mechanisms—for example, through the development of tools for efficiently screening and prioritizing information—are important to ensure countries can manage the increasing volume of available information.

Moving Forward While Looking Backwards.

Given that 151 countries participate in the WTO negotiations, it is not surprising that overall efficacy and the process of achieving consensus has been slow. From an individual country’s perspective, it is important to procure additional information about the future, particularly the prognoses on how agricultural trade patterns may shift before the country commits to a particular offensive

tions. For developing countries, maintaining access to accurate and up-to-date national data is a chronic problem. In many of the analyses that need to take place to inform negotiating positions, the relevant data can be five to ten years old. The use of older data in the context of shifting global agricultural trade and production causes negotiating positions to be outdated by the time the Round’s conclusions are implemented.

Second, while climate change-induced shifts in agricultural production will alter interest group pressures and create new types of protectionist incentives at the national level, in many cases, entrenched domestic political interests will still control parts of the domestic policy agenda. Those groups that have benefited from public support in the form of subsidies in the past will have a greater ability to lobby for continued public support. Thus, although shifting productivity associated with climate change should re-shape countries’ defensive and offensive interests within

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or defensive position. However, from the point of view of the system as a whole and the changing climate, there are at least two reasons why countries’ positions in the long-term are likely to be mismatched with the economic conditions.

First, countries base their negotiating positions on analysis of domestic data and the available information about their trade partners. Some countries have current and thorough national data sources from which they can inform their posi-

WTO negotiations, there is likely to be policy inertia during trade negotiations.

To what extent does this policy inertia create a shortsightedness in member countries regarding the full package of the negotiations? Debates concerning agriculture and non-agriculture market access have dominated the current round of negotiations, while other important areas have had less focus. Given the uncertainty related to future global agricultural markets, policymakers, particu-

larly in developing countries, need to develop a broader vision of the ways in which other areas under negotiation might become increasingly relevant.

In the face of an uncertain climate, a focus on protecting particular sectors—or, the alternative, a focus on enhancing market access for particular exports—may benefit particular groups in the short run. This emphasis on short-term goals, however, ignores the need for strategies that could enhance adaptability to changing conditions. Policies related to transport services and infrastructure are more likely to create positive economic dynamics. Consider again a sub-Saharan African country faced with the question of how to best create policies that can mediate anticipated climate change. Exporters in this country must cope with limited infrastructure and logistical capacity that generate costs, increase prices of export products, and ultimately decrease competitiveness. Investments in infrastructure and transport services could improve the efficiency of getting products to market. Since these improvements are not product specific, but rather could benefit multiple exporters, they create conditions for flexibility.

Within the context of particular negotiating areas, given the dynamic effects of investments in services, countries seeking to promote adaptability and resilience should consider the implications of outcomes in the WTO services negotiations on their ability to buffer climate change impacts. A broader view of the range of issues in the negotiations relevant to climate change is important, but within this context, countries will need to seek efficient mechanisms for allocating their limited resources. The Aid for Trade agenda, in particular, stresses the impor-

tance of coordinating supply-side investments among national governmental ministries, and, where appropriate, implementing and financing investments at the regional level. The challenge for many countries is to select two or three objectives of strategic importance to their long-term trade growth, taking into account potential impacts of climate change.

Conclusion. The WTO was never intended to function as a multilateral institution to provide climate change rules. Rather, negotiated commitments under the WTO agreements provide predictability to the current trade system. This institutional predictability can be a useful tool for developing countries, which are confronted with increased physical uncertainty, to seek strategies for economic growth. In the context of current negotiations, many small countries and LDCs can gain market access opportunities without providing equivalent reciprocal access to their own markets. While this may provide a temporary economic buffer, delaying economic adjustment and maintaining market inflexibility would, in the long run, constrain developing countries' ability to respond dynamically to unexpected physical and economic conditions.

Developing countries can also benefit from engaging in the multilateral trade system to the extent that it provides them with mechanisms for stabilizing their relationships with other countries. Alternatives to the formal dispute settlement system provide less resource-intensive means of raising the political profile of particular concerns. These approaches may become particularly relevant if, as argued above, countries increasingly implement short-term trade restrictive

measures to address emerging SPS risks. Clearly, pests, such as the cassava mealybug, move unrestrictedly across socio-political and geographic boundaries. In addition to the specific institutional mechanisms for handling conflict, an integrated multilateral trade system can facilitate cross-country management of increased SPS risks by creating conditions enabling countries to share information regarding the prevalence of pests and policies to monitor their population growth.

What other approaches could the WTO take as an institution to enhance transparency in the area of trade policies? Given the looming uncertainty, it becomes imperative that the trade policy community develop and maintain up-to-date, accessible public data for decisionmakers. If climate change indeed increases weather volatility and hence the volatility of agricultural output, current data, including economic parameters and productivity levels, is even more crucial.

As new data products become available, the need for tools and frameworks for synthesizing and analyzing data also increases. Inter-disciplinary tools that capture spatial relationships become increasingly relevant in approaching this

challenge. While the WTO will not be the lead international institution with respect to climate change, the trade community would benefit from the WTO's involvement. The WTO can leverage its own position to develop and maintain links with relevant international institutions to ensure that information about food and agricultural production is accurate, unbiased, and easily accessible.

Climate change will shift agricultural production, consequently creating new dynamics in international trade. The primary danger for many resource-poor countries will be that, in response to crisis situations, emergency policy decisions will be implemented that will ultimately divert their economies from their strategic growth options. The challenge for the WTO, both the institution and its members, will be to promote trade policy frameworks that provide transparency and predictability without losing flexibility to adapt to unanticipated changes associated with the climate patterns. In this way, the WTO could create an additional buffer against the long-term economic impacts of climate change, thereby enhancing the resiliency of nations in the face of increased risk in agricultural trade.

NOTES

1 Food and Agriculture Organization, *Adaptation to Climate Change in Agriculture, Forestry, and Fisheries: Perspective, Framework and Priorities* (Rome: FAO, 2007).

2 William Cline, "Global warming and agriculture: New country estimates show developing countries face declines in agricultural productivity. CGD Brief September 2007," (Washington, DC: Center for Global Development, 2007).

3 UN Commodity Trade Statistics Database, 2007.

4 Jeffrey Sachs, "Climate change refugees," *Scientific American*, (1 June 2007).

5 "Mountain Pine Beetle Program." Natural Resources Canada, http://www.mpb.cfs.nrcan.gc.ca/index_e.html (date accessed: 24 September 24 2007).

6 "Revised draft modalities for agriculture," World Trade Organization, http://www.wto.org/english/tratop_e/agric_e/agchairt xt_1aug07_e.doc (date accessed: 25 September 2007).

7 "Biological control of Crop pests in the fields of Africa," <http://idrinfor.idrc.ca/archive/ReportsINTRA/pdfs/v13n3e/110878.pdf>. (date accessed: 25 September 2007).