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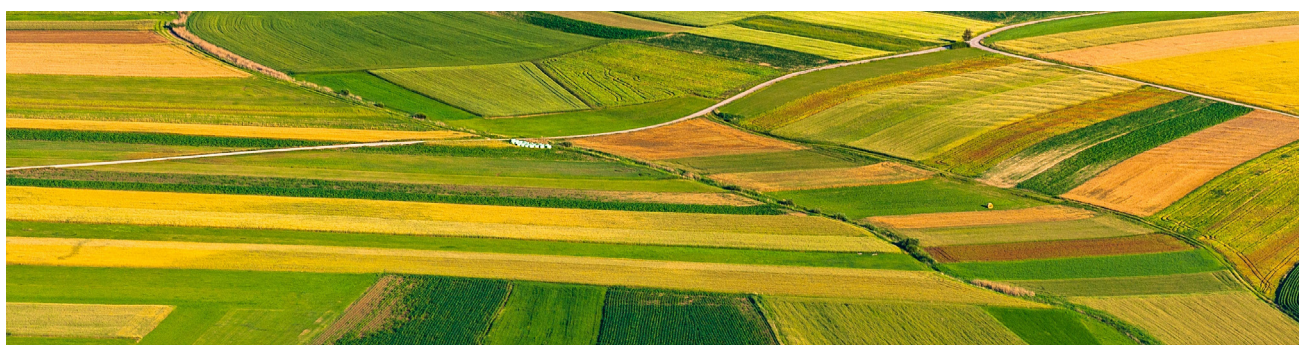
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STRENGTHENING THE GLOBAL TRADE SYSTEM



International Trade Disciplines and Policy Measures to Address Climate Change Mitigation and Adaptation in Agriculture

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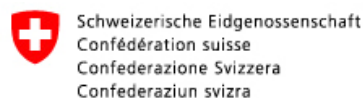
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ABSTRACT

An increasing concentration of greenhouse gases (GHGs) in the atmosphere is believed to be contributing to global warming. Agriculture is a significant contributor to GHG emissions through crop and animal production and land clearance, but it can also recycle and sequester atmospheric carbon. Climate change has major implications for global agriculture. Efforts will be made to mitigate GHG emissions by the agricultural sector and to increase its role in removing carbon from the atmosphere. Changes in temperature and rainfall patterns and greater climatic instability are problems that the sector will have to adapt to. Policies to promote mitigation and adaptation may be driven by domestic political concerns or by international climate agreements. The use of policy instruments for agriculture in response to climate change poses challenges for the international trading system. The extent to which mitigation or adaptation measures are consistent with current international trade disciplines is a major issue. Climate change policies could become a guise for protecting domestic food and agricultural sectors from international competition. An important issue that has to be addressed is what modifications need to be made to allow countries to achieve their objectives while, at the same time, preventing undue restrictions on trade. There is a potential for a clash with WTO trade rules depending on the choice of instruments and the way governments choose to implement these. A broad international consensus has to be reached on the issues and suitable approaches if the possibility for future conflict between climate policies and trade policies is to be reduced.

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LIST OF ABBREVIATIONS

AoA	Agreement on Agriculture
BTA	Border Tax Adjustment
ETS	emissions trading system
EU	European Union
FAO	Food and Agriculture Organization
FTA	free trade agreement
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GHGs	greenhouse gases
LCA	Life Cycle Analysis
NAFTA	North American Free Trade Agreement
NPS	Non-point Source
PVS	Private Voluntary Standards
SCM	Subsidies and Countervailing Measures
SDT	Special and Differential Treatment
SPS	Sanitary and Phytosanitary Measures
TBT	Technical Barriers to Trade
US	United States
WTO	World Trade Organization

INTRODUCTION

An increasing concentration of greenhouse gases (GHGs) in the atmosphere is believed to be contributing to a warming phase in the earth's climate. Agriculture makes a significant contribution to GHG emissions through crop and animal production and through land clearance, particularly in comparison to its contribution to global gross domestic product (GDP), but the sector can also recycle and sequester atmospheric carbon for significant periods of time.

Projected changes in the earth's climate have major implications for global agriculture. There are likely to be efforts to mitigate emissions by the sector and to increase its contribution to the removal of carbon from the atmosphere. In addition, the sector will need to adapt to changes in temperature and rainfall patterns, and to greater climatic instability. Policy initiatives to promote mitigation and adaptation may be prompted by domestic political concerns or by international climate agreements. The use of policy instruments for agriculture in response to climate change poses challenges for the international trading system. A key issue is the extent to which mitigation or adaptation measures are consistent with existing international trade disciplines. Climate change policies could easily become a guise for protecting domestic food and agricultural sectors from international competition. There is a need to address what modifications, if any, might be made to allow countries to achieve objectives in this area while, at the same time, preventing undue restrictions on trade.

Various forms of taxes, subsidies, and regulatory measures can be used to pursue climate policies for agriculture. Additional costs imposed on domestic producers are unlikely to be challenged through the World Trade Organization (WTO). Subsidies are likely to be more problematic, particularly if they are viewed to be output-enhancing and potentially actionable under the Agreement on Subsidies and Countervailing Measures (SCM). A number of policy measures that are promoted on the basis of environmental objectives can be an implicit form of subsidization and pose particular difficulties due to a lack of coverage under existing international disciplines. Domestic mandates for the use of bioenergy, particularly biofuels, are problematic. The promotion of the use of agricultural feedstocks for bioenergy is controversial, both in terms of its effectiveness in reducing GHG emissions, and its impact on food prices and poor consumers.

Border measures associated with climate policies, particularly environmental standards imposed on imported products, also pose challenges to international disciplines. Such measures can potentially be justified under Article XX of the General Agreement on Tariffs and Trade (GATT), particularly through

the provision relating to the protection of natural resources. But unrestricted use of this exemption, even if applied in a non-discriminatory manner, could undermine existing international disciplines and compromise efforts to reduce barriers to trade.

Some degree of coupling of subsidies to production will be required to meet mitigation or adaptation objectives in agriculture. The existing requirement under the Agreement on Agriculture (AoA) that payments under environmental programmes be limited to compensating for additional costs incurred or income foregone could severely hamper achieving targeted environmental outcomes. Environmental standards for domestic and traded commodities may also be required to avoid carbon leakage. To reduce the possibilities for conflict, greater international consensus is needed on what domestic measures are appropriate in pursuing climate policy objectives and what standards can be applied internationally. Greater scrutiny of policy measures is required to ensure that these do not become a disguised vehicle for protecting domestic agricultural sectors from international competition.

Developing countries are likely to face significant challenges in adapting to climate change while, at the same time, dealing with increased demand for food and agricultural products due to population and income growth. The principle of special and differential treatment (SDT) for developing countries can be applied to facilitate the use of policies that will lead to higher productivity, but there is also a need to reduce the intensity of GHG emissions in food production, and pressures on scarce natural resources, particularly water. Greater use of subsidies that promote intensive use of energy or energy-intensive inputs, or the inefficient use of water pose problems for limiting the environmental footprint of agriculture as it seeks to meet expanding food needs. Developing countries will need access to technologies that will enable them to increase the resilience of agriculture in the face of climate change. National and international aid programmes can play a role, as can Aid for Trade initiatives.

International trade can contribute to addressing the challenges posed by climate change for the world's food system. Trade can help to provide a buffer against short-term disruptions in supplies caused by extreme weather events, such as drought or floods, which are likely to be more prevalent as global average temperature rises. Through the exploitation of comparative advantage, trade can help to achieve needed structural shifts in world agricultural output as the climate changes. While it may be difficult to reduce total GHG emissions in the face of substantial increases in the demand for food and agricultural raw materials, there is considerable scope for reducing the volume of emissions per unit of agricultural output. Freer trade can contribute to this outcome.

It will be important to avoid any adversarial positions that might cast the trade system as inhibiting the ability of countries to respond in ways that they see as sensible to promote mitigation and adaptation in the face of climate

change. This is particularly critical in the use of agricultural subsidies, as the domestic politics of incorporating the sector into climate change policy could well prevail over the sensitivities of trade partners. The potential for a clash with WTO trade rules lies both in the choice of instruments and the way governments choose to implement these. There is a need to develop a broad international consensus on the issues and suitable approaches if the possibility for future conflict between climate policies and trade policies is to be reduced.

INTERNATIONAL TRADE DISCIPLINES AND POLICY MEASURES TO ADDRESS CLIMATE CHANGE MITIGATION AND ADAPTATION IN AGRICULTURE

It is now widely accepted that the world's climate is changing and that we are in a period of global warming. There have been various phases of warming and cooling even within the span of human history, and there is disagreement on how much of the current warming phase is due to human activity and the emission of GHGs. The concentration of these gases (primarily water vapour, carbon dioxide, methane, and nitrous oxide) has increased substantially since the beginning of the Industrial Revolution in Europe in the 18th century (Solomon et al. 2007).

Agriculture is unusual in that it can contribute to increasing or decreasing the concentration of atmospheric GHGs. It generates GHG emissions through crop and animal production, but can also recycle or remove carbon from the atmosphere for significant periods of time through sequestration. Agricultural production is a major source of GHG emissions, directly accounting for an estimated 10% to 12% of the global total (Wreford et al. 2010). If the clearance of uncultivated land for agriculture is taken into account, the contribution is substantially higher. The emission share may be compared to an estimated share of world GDP of around 6% (CIA 2011). Methane (CH₄) generated by animals and rice production accounts for more than 50% of agriculture's GHG emissions (CO₂ equivalent), with the balance primarily made up of nitrous oxide (N₂O), generated by soil and land management practices. Agriculture accounts for roughly 60% of global emissions of nitrous oxide and 50% of

total methane emissions. The food and agricultural industry is a major user of energy in the production of inputs, the processing of commodities, and the use of transportation. These activities also generate significant GHG emissions.

It is increasingly recognised that climate change will have major implications for world agriculture. There are likely to be efforts to mitigate emissions by the sector and to increase its contribution to the removal of carbon from the atmosphere. In addition, the sector will need to adapt to changes in temperature and rainfall patterns, and to greater climatic instability. Policy initiatives to promote mitigation and adaptation may be prompted by domestic political concerns or by international climate agreements.

Policy instruments for agriculture that are emerging in response to climate change pose challenges for the international trading system. At the broadest level, an open trading system is perhaps the best guarantee for promoting adaptation and dealing with severe disruptions to economic activity as a result of climate change. As different regions face higher or lower temperatures, rainfall, and other climatic changes, trade will allow patterns of production to change over time, and will also compensate for local supply disruptions. If droughts and floods are more common, assistance flowing through established trade channels will be more quickly available. Steps such as the completion of the Doha Round of negotiations in WTO make good sense even in the context of concerns over climate change.

It will be important to avoid any adversarial positions that might cast the trade system as inhibiting the ability of countries to respond in ways that they see as sensible to promote mitigation and adaptation. This is particularly critical in the use of agricultural subsidies, as the domestic politics of incorporating the sector into climate change policy could well prevail over the sensitivities of trading partners. The potential clash with WTO trade rules comes both from the choice of instruments and the way governments choose to implement these.

A key issue from the perspective of international trade is the extent to which mitigation or adaptation measures are consistent with existing international disciplines. What modifications, if any, might be made to allow countries to achieve objectives in this area while, at the same time, preventing undue restrictions on trade? Climate change policies could easily become a guise for protecting domestic food and agricultural sectors from international competition.

Emissions of GHGs (mainly methane, carbon dioxide and nitrous oxide) are generated throughout the entire food and agricultural supply, and distribution system, from the production of agricultural inputs to the final consumption of food products (for example, the miles driven by shoppers to supermarkets or food service outlets). Policy approaches that attempt to include agriculture in the abatement of GHG emissions and in GHG mitigation can take several forms (Blandford and Josling 2007). These include,

- Reduction in the amount of GHG emissions generated by crop and livestock production.
- Absorption of emissions through photosynthesis and the storage of carbon in organic matter (sequestration).
- Production of crops that can aid the replacement of high GHG-emitting products with potentially lower emitting products (for example, biofuels).
- Switching to alternative energy sources on farms that reduce reliance on carbon-based sources of energy (for example, co-generation).

A range of domestic policy measures can be used to further these aims. These include,

- Taxes—either explicit or implicit levies on agricultural inputs or outputs linked to their embodied contribution to GHG emissions (for example, fossil fuel intensity) or to explicit emissions of GHGs by the sector (for example, methane).
- Subsidies—relating to the generation and adoption of GHG-reducing technologies or practices or to compensate for losses associated with climatic events.
- Regulations—for production processes that limit certain practices (for example, manure management), product standards for embodied GHG emissions (the so-called carbon footprint of products), or mandates on the use of substitute products whose production and consumption is thought to result in lower GHG emissions (for example, mandates on the use of biofuels).

DOMESTIC CLIMATE CHANGE POLICY MEASURES AND CURRENT INTERNATIONAL TRADE DISCIPLINES

The use of taxes to internalize the costs imposed by pollution has long been advocated by economists. The “polluter pays” principle is often proposed as being both an efficient and “fair” approach to dealing with environmental externalities by creating a price for the unpriced effects of economic activity. Some countries already use explicit taxes, such as taxes on energy or fertilizer, primarily to raise government

revenue. These could be more broadly applied and targeted to reduce input use in line with environmental policy objectives. Implicit taxes can also be imposed through mechanisms such as cap-and-trade schemes that limit the total amount of emissions and allow the trading of emission permits. If the cap is binding, the costs incurred in obtaining permits will be reflected in higher prices for goods and services, discouraging the production and consumption of higher emitting products and promoting the adoption of production methods that generate lower emissions. If such taxes impose additional costs on producers, they would not be covered under existing international trade disciplines since they are likely to depress rather than enhance output. The focus of international agreements is primarily on measures that increase the competitive advantage of an industry in a country at the expense of other countries.

Despite this, there might be an issue of implicit subsidization through the exemption of agriculture from climate taxes or the provision of tax rebates (for example, on energy) or through the exclusion of agriculture from GHG limitations under cap-and-trade schemes (especially where farmers are allowed to profit from the sale of GHG-reduction credits). Agriculture is a relatively GHG-intensive sector and this would argue for its inclusion under an emission cap, but there are considerable practical difficulties in monitoring and enforcing regulations in the sector, and in the application of taxes primarily because of the non-point-source (NPS) character of emissions. The free distribution of emission permits (rather than through a required payment) could be considered a subsidy to industries in general, as could payments for GHG reduction credits (sale of offsets), but these measures are not necessarily production enhancing. The more relevant issue is likely to be pressure to impose border tax adjustments (BTAs) to offset the competitive disadvantage faced by domestic producers in countries that use environmental taxes for imports from countries that do not use such taxes. This issue is discussed further below.

In a manner similar to cap-and-trade schemes, process or product regulations (including product standards) are likely to impose additional costs on domestic producers. This is unlikely to enhance international competitiveness and would be unlikely to be challenged by other countries. The more relevant issue for international disciplines is when such standards are imposed on products imported from other countries. Trade can also be affected by private standards, especially product or production requirements that are largely outside the control of policymakers. These issues are discussed in more detail below.

Policymakers are often reluctant to impose taxes on farmers, and have a predilection for the use of subsidies (that is, the use of carrots, rather than sticks) to pursue environmental objectives in agriculture. The treatment of subsidies in WTO has a complex legal history built on experiences with the GATT. Subsidies for agriculture are currently covered both by the SCM and the AoA.

Under the SCM, the qualifying characteristics of a subsidy are that it entails a financial contribution; is made by a government or public body within the territory of a Member; and confers a benefit. A subsidy is not subject to the full disciplines of the SCM unless it is specifically provided to an enterprise or industry, or a group of enterprises or industries. Certain subsidies are prohibited (export or local content subsidies) and others may be actionable (subject to challenge). Non-prohibited subsidies may be challenged on the basis of injury to a domestic industry through imports of subsidized products; serious prejudice (for example, through displacement of exports to the subsidizing Member or in a third country market); or through nullification or impairment of benefits (for example, improved market access under a negotiated reduction in bound tariffs being undercut by the effects of the subsidy). During the implementation period of the AoA until 1 January 2003, special exemptions applied to agricultural subsidies, but these are now subject to the provisions of the SCM.

A wide range of explicit or implicit subsidies could potentially be provided to farmers as part of climate change policies. Some of these might qualify under the Green Box (Annex 2) heading of the AoA as minimally production- and trade-distorting domestic support. Prime examples would be expenditures on research and development for new production methods or technologies related to mitigation/adaptation, or expenditures incurred in the diffusion of knowledge related to these. It is unlikely that such expenditures would be challenged by other countries in WTO, particularly since some of the benefits may be transferable across borders.

Other measures that might fall under the Green Box are payments under environmental schemes with objectives linked to climate change; for example, the promotion of mitigation activities such as reduced tillage, idling of farmland, or its conversion to sequestration activities, such as the production of woody biomass. Agriculture can play a role in sequestering atmospheric carbon by avoiding deforestation, using environmentally sensitive lands (for example, peatland), and adopting certain production practices. The Green Box provisions for payments under agri-environmental schemes, if strictly applied, are quite limiting. They restrict payments to compensation for extra costs incurred or loss of income involved in complying with a programme, that is, they exclude incentive payments. While some farmers may be willing to participate in environmental programmes without receiving payments in excess of compliance costs or income foregone, others may not. If payments are to be made for sequestration activities, these might need to not only cover their costs, but also reflect the benefits generated by keeping land out of agricultural production and in agro-forestry (that is, the value of carbon removed from the atmosphere). If payments enhance production, they would be potentially subject to challenge under the SCM. Since sequestration payments may reduce agricultural production, they are unlikely to be considered a production-/trade-distorting payment for agriculture,

although they could affect trade in woody biomass products (bioenergy or timber).

Payments under schemes linked directly to clearly defined agri-environmental objectives are likely to be superior to payments with other primary objectives, such as income support, even if these have environmental provisions (for example, keeping land in good environmental condition). There is a strong likelihood of over-compensation for the provision of environmental goods, and a higher likelihood of production and trade distortions through payments that are indirectly targeted to environmental outcomes. If environmental objectives are to become more important in agriculture, the use of incentive payments for the provision of environmental goods will inevitably surface as an important issue. Some recoupling of payments to production may be required to achieve environmental objectives, but there is a need for consensus on what is permissible. There is also a need for contestability (through notification and enhanced scrutiny with possibilities for challenge) to limit the possibility that environmental schemes will become a popular vehicle for protection.

Other forms of expenditure associated with climate change policies may or may not qualify for the Green Box, for example, domestic subsidies for the adoption of new technologies; payments for crop or livestock losses associated with climatic events; or insurance subsidies. Government financial participation in crop or income insurance, income safety net programmes, and payments triggered by natural disasters are permitted under the Green Box, but only under strict conditions on when payments are triggered and their nature. Such payments can be justified on the grounds of the social benefits of sharing risks associated with climate change, and these approaches are likely to become more important with increased climatic instability. However, current Annex 2 provisions seek to ensure that these types of payments do not become a permanent subsidy and are minimally production-distorting. When there is a continuing element of subsidy (for example, through a government-supported insurance scheme), payments are most likely to fall under the heading of Amber Box support—either product-specific or non-product-specific—and should be notified as such under the AoA.

Payments related to structural adjustment (including investment subsidies) and for permanently disadvantaged regions are included under the Green Box category, providing that these satisfy certain conditions. Such payments could become more prevalent if climate change severely disadvantages some producers or regions, and governments seek to address this through structural measures, such as the retirement of land or diversion of land to other uses, or through the promotion of "climate proofing" investments, such as investment in infrastructure. However, if subsidies for inputs are used to further mitigation or adaptation objectives, these would generally qualify for inclusion under the Amber Box rather than under the Green Box.

Other forms of support that may be associated with climate change adaptation (for example, irrigation subsidies) should be included in Amber Box notifications (as product-specific or non-product-specific support), but overall the treatment of input subsidies in domestic support notifications tends to be weak. This is important since such subsidies can be counterproductive in terms of achieving climate change mitigation, and can have negative impacts on natural resources. Subsidies related to the use of fertilizer, energy or water can be particularly problematic.

Agriculture is increasingly being called upon to provide biomass for non-food uses. This is particularly so with biofuels. The role of biofuels in climate change is debated, particularly whether and to what extent the replacement of fossil fuels by biofuels reduces the impact of energy consumption on the atmospheric concentration of GHGs, and the broader environmental impact of biofuel production on soil and water resources. The treatment of biomass production for non-food uses is an important issue. Even though government policies for biofuels are not the only factor contributing to higher global food prices, there is considerable concern about their potential impact on poor consumers (Babcock 2011; Wright 2011). Currently, subsidies for the production of agricultural products that can also be used as feedstocks for biofuel are required to be reported as product-specific support under the AoA. However, there is some ambiguity as to whether biomass produced exclusively for energy use would be covered by this requirement.¹ In addition, a significant amount of the support provided for biofuel feedstocks is currently attributable to the increased demand generated by consumption or blending mandates for biofuels. The indirect support provided through such measures is not covered by the AoA or the SCM.

BORDER MEASURES ASSOCIATED WITH CLIMATE CHANGE POLICIES AND INTERNATIONAL TRADE DISCIPLINES

Concern is often expressed that domestic environmental policies can be undermined by international trade. There may be pressure to offset the competitive effects of taxes or environmental regulations through adjustments in tariffs or other border measures. If a domestic industry is being taxed to reduce the use of fossil fuels or emissions of GHGs, imports from competing countries using similar technologies will not help to achieve these objectives globally but will simply result in “carbon leakage” through cross-border relocation of production. The tax merely redistributes emissions among countries and does not achieve the broader goal of GHG reduction or fossil fuel replacement. On the other hand, the transfer of production to countries able to employ lower-emission technologies can help to achieve an overall increase in global efficiency by generating lower carbon emissions per unit of agricultural output. Climate change is likely to alter comparative advantage in many countries. Given the demands that will be placed on global agricultural resources by an expanding world population, it is important that increased global production of food is associated with a reduction in its relative environmental footprint. Achieving a reduction in emissions in each country individually is not necessarily the most efficient way to achieve a reduction in global emissions. This is likely to require the relocation of production to more environmentally efficient regions (Nelson et al. 2009).

Where carbon leakage occurs, countries have a limited ability to adjust tariffs under existing WTO agreements to address the issue. If applied tariffs are less than bound tariffs, they could be increased, but this cannot be discriminatory. This means that they cannot be targeted on products from countries that generate high emissions per unit of output. Hence, while a general tariff increase could help to reduce imports from high carbon emitters with relatively low production costs, it will disproportionately affect low carbon emitters with relatively high production costs. A carbon tax is a broad-based tax and raises issues similar to the use of sales taxes or value added taxes. If industries are taxed at the point of production (the origin principle), then a country's

1 The AoA refers to “basic” agricultural products and to support in favour of “agricultural producers”. The list of agricultural products covered by the agreement (Annex 1) does not include wood or most cellulosic fibres but does cover oilseeds. So it would appear that some bioenergy feedstocks are potentially covered by the agreement, while others are not.

exports will be disadvantaged and imports encouraged unless imports face the same tax and corresponding domestic products are taxed in the country of destination. BTAs are consistent with WTO rules, but their implementation could cause problems and could be challenged on the basis of a violation of the non-discrimination principle of GATT.²

Article XX of GATT provides some exceptions for the use of border measures that are inconsistent with GATT principles. Exception (b) covers measures "necessary to protect human, animal or plant life or health" and exception (g) covers measures "relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption." The use of measures relating to these exceptions has generated a limited number of dispute settlement cases (for example, the Shrimp-Turtle case involving the United States). The ruling in that case (that a prohibition on imports of products that were caught in ways that could cause injury or death to sea turtles was permissible, but only if applied in a non-discriminatory way) seems to open the possibility that non-discriminatory import restrictions could be imposed under exception (g), where applicable. However, following the line of reasoning above in connection with the use of tariffs, the requirement for the non-discriminatory application of restrictions would limit severely the practical usefulness of the exception in the context of WTO agreements. This issue also has relevance for the use of product standards and labelling, as discussed below.

Despite the questionable status of environmental provisions under WTO agreements, a growing number of free trade agreements (FTAs) are incorporating such provisions. Ever since the conclusion of the North American Free Trade Agreement (NAFTA), the US has included environmental provisions into its FTAs, including those with Australia, Singapore, Peru, and Chile, using the principle that any restrictions should be based on scientific evidence. In contrast, the European Union (EU) has taken the view that trade restrictions should be permitted for environmental protection based on the precautionary principle. Negotiations on the Canada-EU FTA have been considering the inclusion of this principle. The EU-Singapore FTA embodies the principle of sustainable development and measures designed to promote "green" growth. Both the EU and the US have sought to use trade restrictions to prevent illegal logging. The EU has discriminatory carbon-based restrictions on imports of biodiesel.³

Incentives for the production and use of biofuels are increasingly important for international trade. A number of countries, including Brazil, the EU and the US use mandates and tax incentives to promote the use of biofuels. It has been argued that mandates sometimes give a preference for the use of domestically produced biofuels and can also stimulate exports. The EU uses environmental standards (net reduction in carbon emissions) to discriminate among different biofuels, and these standards may discriminate against certain types of imported products (Swinbank

2009). Restrictions on trade (whether through import regulations or other measures) resulting from biofuel policies may be subject to challenge under existing international trade law. This has already happened in the application of carbon footprint standards by the EU. Despite this, the measures might be justified under Article XX (Lendle and Schaus 2010). Direct subsidies for the production of biofuel feedstocks that qualify as agricultural are supposed to be reported to WTO and are also potentially subject to challenge under the SCM. However, implicit subsidization through mandates and other domestic regulations is more difficult to challenge because of the need to establish that an implicit subsidy is generated and that it meets the conditions of the SCM. If biofuels continue to be a major part of renewable energy policies, it seems likely that the potentially trade-distorting effects of these policies will become more important, and this could lead to trade tensions and disputes (Josling et al. 2010).

PROCESS OR PRODUCT REGULATIONS AND CRITERIA FOR ENVIRONMENTAL LABELLING

The application of environmental standards to food products and the use of environmental labelling are becoming popular in many countries. Various categorizations can be used, but the most popular is labelling based on the carbon "footprint" of a product. This typically corresponds to an estimate of the amount of carbon generated in GHGs in the production, processing, and transportation of a given food product. A large number of carbon labelling initiatives have been launched since 2007. The majority of these are private voluntary standards (PVS) initiated and implemented by retailers. Retailers use PVS to address the perceived concerns of consumers about the environmental implications of their

2 Article III of GATT specifies that BTAs should not be applied so as to afford protection to domestic production, so their calculation could be challenging. Also, a regulation is not a tax, so a levy on imports designed to match compliance costs (for example, additional costs imposed by cap-and-trade) is not strictly a BTA.

3 Rules introduced by Spain that specifically favour biofuels produced in the EU in legislation that implements the EU's Renewable Energy Directive have resulted in the filing by Argentina of a WTO complaint (DS443) under the dispute settlement process.

purchasing decisions. Labelling of the carbon footprint of products informs consumers who are concerned about the potential environmental impact of their purchasing decisions and keeps them as customers. Retailers may also be able to collect a price premium from consumers willing to pay for low-carbon goods. Early adoption of carbon-monitoring systems may provide a first-mover advantage over competitors in the longer term (MacGregor 2010).

There are many challenges involved in measuring the carbon footprint of food and agricultural products. Ideally, one would wish to use Life Cycle Analysis (LCA), that is, the total amount of carbon emissions associated from the full industrial process of producing and distributing a good. However, estimating LCA carbon content is extremely difficult in many cases. Comparison of carbon emissions based on simple concepts such as “food miles”—the distance that a product travels—can be extremely misleading because of major differences in emissions in production. Products may differ substantially in the energy required to produce them, for example, and a product that has travelled a long distance may have lower emission content than one produced locally under energy-intensive conditions. Because of its exclusive focus on transportation, labelling based on food miles is likely to benefit local products and disadvantage internationally traded products.

PVS are likely to impose additional costs on suppliers through their implications for process requirements and the need for monitoring and verification. They are likely to put small-scale producers at a particular disadvantage and can be challenging for producers in developing countries. However, it is difficult to argue that many PVS are an explicit discriminatory device against traded products, since they are also generally imposed on local suppliers. Local small-scale suppliers of food and agricultural products are often vocal in complaining about the difficulties that PVS can create for them. The difficulty arises if PVS are transformed into legislated standards (LS), and if these are structured in such a way as to discriminate against imports.

The treatment of product standards is covered by the Agreement on Technical Barriers to Trade (TBT); several other WTO agreements, for example, the Agreement on Sanitary and Phytosanitary Measures (SPS), may be relevant. All the agreements indicate that no country should be prevented from taking measures necessary to ensure the protection of human, animal, or plant life or health. The TBT agreement extends this principle to protection of the environment. All indicate that such measures should not be discriminatory across countries or constitute a disguised restriction on international trade.

The TBT agreement focuses on ensuring equality of treatment in technical regulations for imported products and “like products” of national origin (Article 2:1). An important issue is whether the environmental provision would permit countries to impose technical regulations associated with the environmental characteristics of products, such as their

carbon footprint. Would products that involve differing carbon footprints be considered “like products”? Suppose a country decided to require its farmers to use production practices that reduced GHG emissions, could it then require that imports be produced using the same or comparable practices? A priori, the answer would seem to be no. The TBT does not allow countries to impose their production regulations or standards on other countries nor does it allow prohibitions on imports produced using a lower standard. On the other hand, the ruling in the shrimp-turtle case seems to suggest that an exemption to this requirement might be possible under Article XX.

Suppose, instead, a country required all domestic products to be labelled for their carbon footprint, but could it require the same for imported products? The answer is unclear. So long as labelling is required for both domestic and imported products, this would seem to be permitted under the TBT agreement. But, since the TBT agreement requires equal treatment for imports of “like” products, it does not appear that imports alone could be required to be labelled or if the nature of the labelling is likely to result in discrimination. Again there might be a case for an exemption under Article XX if it could be shown that the requirement was necessary for the protection of natural resources.

The issue of the consistency of climate change policies with GATT rules has surfaced directly through the expansion of the EU emissions trading system (ETS) to cover aviation on 1 January 2012. This requires all airlines to acquire and surrender allowances for carbon emissions generated by their flights. It applies to both EU and non-EU airlines and to flights between EU and non-EU airports. While the scheme may contravene some articles of GATT, it may be justified under Article XX primarily since the measure is designed to protect an exhaustible natural resource (the atmosphere) and is implemented in conjunction with similar domestic measures (Bartels 2012).⁴ If this is so, other environmental measures that meet the requirements of Article XX may also be judged to be permissible. The key requirement is that any measures shall not be applied “in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade.”

WTO agreements that relate to standards place particular emphasis on the development of international standards. The SPS Agreement, for example, links the work of bodies such as the Food and Agriculture Organization's (FAO) Codex Alimentarius Commission and the International Office of Epizootics (OIE) explicitly to the agreement. The role of international standardization is also central to the TBT agreement. This suggests that an international approach to identifying the environmental characteristics of goods, such as their carbon footprint, would reduce the likelihood

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After an extensive discussion of the legality of the scheme, Bartels (2012) concludes, “The important point is that the core of the EU's aviation scheme appears to be justified under Article XX of the GATT.”

of standards or labelling requirements being challenged through WTO and could also help to limit the tendency for the proliferation of private standards (Earley 2009; Roberts and Josling 2011).

In many countries where product standards and labelling are an issue, governments are not necessarily in the vanguard in such initiatives. These are often led by private companies. Organizations such as GlobalGAP, which establishes voluntary standards for the certification of agricultural products as being “safe and sustainable” have emerged to provide certification for farmers wishing to prove to retailers that they meet certain production standards. The SCM agreement makes reference to the activities of “private bodies” in the provision of subsidies, so that such activities are not entirely excluded from the ambit of WTO agreements. However, it remains to be seen to what extent specific activities undertaken by private entities that may provide a competitive advantage to domestic producers or disadvantage foreign suppliers could be subject to challenge under WTO agreements. The SCM specifies that this may be the case if “a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out functions (for which a subsidy shall be deemed to exist) which would normally be vested in the government, and the practice, in no real sense, differs from practices normally followed by governments.” (Article 1.1 [iv]).

DEVELOPING COUNTRIES, CLIMATE CHANGE AND INTERNATIONAL TRADE DISCIPLINES

It is generally accepted that the agricultural sectors in many developing countries will face major challenges in adapting to climate change. Countries in tropical and sub-tropical zones are likely to experience significant increases in average temperatures and increased climatic instability. Some areas will face major reductions in precipitation and critical water problems, whereas others could face increases in precipitation and higher flood risk. Estimates suggest that more than 10% of the arable land in developing countries could be affected by climate change (Keane et al. 2009). Much of the projected growth in the world's population is in developing countries, and this will place additional pressures on land and natural resources. The clearance of land, particularly forests, for conversion to agriculture is a significant source of GHGs. There will therefore be an urgent domestic need for adaptation, and an international need to

promote mitigation in developing countries, while at the same time increasing productivity in the agricultural sector. While it may be extremely difficult to achieve a reduction in the total emissions of GHGs from agriculture in developing countries (and globally for that matter), it will be vital to reduce the intensity of emissions—emissions per unit of agricultural production—at the same time as increasing efficiency in the use of scarce natural resources, particularly water.

The GATT/WTO framework provides for SDT for developing countries; an important issue is how this would be applied to climate change policies for agriculture. The AoA currently provides for special treatment for investment subsidies in developing countries, and for agricultural input subsidies to low-income or resource-poor producers. Rules that are premised on the notion that agricultural subsidies add to surpluses and retain inefficient productive capacity may not be suited to many developing countries, particularly the poorest. Some relaxation of rules for developing countries has been proposed during the Doha negotiations, for example, criteria to be applied to income insurance and disaster relief. Few would argue that developing countries that seek to modernize their agricultural sectors to improve productivity and resilience in the face of climate change should be prevented from doing so through international disciplines. However, the compatibility of certain measures, particularly input subsidies for energy and aids for conversion of land to agricultural uses, with climate change objectives is questionable. In particular, the provision of subsidies for the use of energy or water in agriculture, in developed and developing countries, needs to be avoided if the environmental footprint of agriculture is to be contained.

Investment in basic research and new technologies, for example the development of drought resistance in food crops and more efficient irrigation systems, will be needed to address the productivity challenges facing many developing countries. But of equal importance is addressing structural limitations in the adoption and use of available technology. Several approaches can be taken to remove impediments to adoption, including the strengthening of extension efforts, expanding access to credit and insurance, and greater integration of input and output markets through improvements in local institutions and infrastructure (Lybbert and Sumner 2010). There is considerable scope for national aid programmes and for international financing mechanisms to be refocused to address environmental sustainability in developing countries, while at the same time promoting increased productivity. In addition, existing technical assistance programmes such as Aid for Trade can be strengthened to enhance climate change resilience in the agricultural sectors of developing countries, and to enable them to cope with the challenges and opportunities that will be created for the international trading system by climate change policy (Keane et al. 2009).

WTO PRIORITIES IN THE AREA OF CLIMATE CHANGE

International trade can make a positive contribution to addressing the challenges posed by climate change to global food security. At the same time, the pursuit of climate change policies for agriculture opens up the possibility of conflicts with existing international trade disciplines. The challenge will be to allow countries flexibility in reducing the environmental footprint of agriculture and promoting greater sectoral resilience while at the same time allowing the benefits of freer trade to be realised. There is a need for greater international consensus on what domestic policy measures are likely to be effective for tackling the effects of climate change in agriculture while being the least trade distorting. There is also a need for enhanced monitoring and scrutiny of measures to avoid trade disputes.

The immediate priority for WTO is to conclude the current round of trade negotiations. In doing so, some important priorities relating to climate change measures could be addressed. These include,

1. Clarification of criteria to be applied under Annex 2 of the AoA (Green Box criteria) to ensure that these exempt policies with clear climate change objectives, combined with enhanced transparency and scrutiny of such policies to ensure that they are minimally production and trade distorting.
2. The provision of special exemptions for least-developing countries in the use of measures to increase agricultural productivity and resilience in the face of climate change (for example, certain types of input subsidies that would otherwise be disciplined under the AoA).
3. Greater transparency in the use of explicit and implicit subsidies for the use of biofuels through enhanced requirements for the notification of biofuel policies and scrutiny of such policies.

Over the medium to long term, additional important issues to be addressed in WTO could include,

1. Clarification of preferred domestic policy measures for climate change mitigation and adaptation in terms of effectiveness and minimally distorting effects on international trade, in the same way that measures for domestic support have been classified by colour codes (amber, blue, and green) on the basis of the objective of reducing protection.

2. Clarification of the definition and use of environmental standards in WTO agreements (particularly the SPS and TBT agreements).
3. Clarification of the scope of Article XX and its application in ways that address climate change issues, such as carbon leakage, while minimizing the use of discriminatory trade measures.

The challenges that face agriculture and the world economy as a result of significant climate change cannot be dealt with solely through agreements that focus on international trade. But it is eminently feasible to ensure that these agreements operate in support of global efforts to address climate change.

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