

Reducing vulnerability to food price shocks in a changing climate

Introduction

For the world's poor – including smallholder farmers as well as urban and peri-urban households – rapid rises in food prices can have immediate and sometimes devastating effects. Households may have to forgo other expenses, such as school fees or doctors' bills, to keep food on the table, or in the worst cases, they may go hungry.

Price volatility thus creates food and nutrition insecurity for millions of people.¹ It can also trigger political unrest;² there are many examples of rapid price increases causing latent social and political tensions to erupt into more overt demonstrations and protest.

The global food price crisis of 2007–08 brought food price volatility into sharp focus for many governments around the world. The crisis resulted from complex interactions of multiple factors: higher oil prices, depreciation of the U.S. dollar, biofuel policies, changing food demand patterns, unusual weather, structural features of international commodity markets and world agricultural trade, as well as trade dynamics and governments' trade policy responses.³

In a changing climate, agricultural production is expected to become more variable, with higher risks of crop failures due to droughts, floods and/or extreme heat.⁴ That, in turn, could increase the volatility of food prices on global markets, with particularly serious implications for countries that import a large share of their food. Global trade has many benefits for both buyers and sellers, but it can also be a source of risk. Through trade, adverse events in one part of the world can affect other countries as well. In the context of climate change, we call this an *indirect impact*.

Much has been written about the 2007–08 food crisis, its causes, and potential solutions. In national adaptation planning, however, global food price volatility is still not widely recognized as a climate-related risk. This discussion brief

Key points

- Many countries are highly dependent on food imports. It is important to recognize this as a form of climate vulnerability, as climate change impacts in producing countries are likely to exacerbate global food price shocks.
- Pursuing self-sufficiency – the approach of Senegal, our case study, and many other countries – may not be a viable solution, as climate change impacts may also affect domestic food production. In this sense, access to trade can be a source of adaptive capacity.
- Risk diversification can help countries reduce their food systems' vulnerability to climate change. Relevant strategies include balancing food imports – particularly of staples such as cereals – with domestic production, and maintaining a diverse array of domestically grown crops to provide alternative food sources in the event of a staple crop failure.
- Adaptation strategies that make sense for individual countries, such as restricting exports during food crises, may exacerbate risks at the global level. It is thus essential to increase research and policy dialogue on how trade policies can help build climate resilience, with an emphasis on food security in vulnerable, import-dependent countries.

examines the nature of this risk and offers some ideas for how import-dependent countries might begin to address it in their adaptation strategies.

We use Senegal as a case study to explore key questions. The West African nation was hit hard by the food crisis, which ignited local tensions and led to rioting on the streets of the capital, Dakar, in April 2008. But what brought the country to this position? Why is it so vulnerable to food price volatility? What is it about global agricultural commodities markets that make them so susceptible to price spikes? And how might climate change affect food price volatility, import dependence, and countries' options for addressing them?

Global food price volatility

Price volatility acts as a signal for buyers and sellers in a market. Without some degree of volatility, markets would not function effectively. However, large, rapid price fluctuations can have a destabilizing effect, particularly in developing countries, where producers and consumers often have limited access to credit and insurance, two key protections against volatility.

For small producers, price volatility makes investments uncertain and risky. Returns are difficult to project when prices change drastically, so farmers often try to remain flexible, to be able to switch from lower- to higher-priced crops, for example, as the markets shift. This may benefit them in the short term, but it discourages investments that might improve their livelihoods in the long term.



A shipment of rice from Vietnam is unloaded in Manila, Philippines.

Photo: IRRI Photos/Flickr

For consumers, price volatility in food staples can effectively reduce households' income, sometimes dramatically. In developing countries, it is not uncommon for people to spend as much as half their money on food, so even small changes in price can make a large impact. Food price volatility thus tends to be a politically sensitive issue for both urban and rural communities. Most governments in developing countries see domestic food price stability as a priority, not only for food security but also to maintain social and political stability.

Developing countries that depend on food imports are keenly aware of their vulnerability to global food price shocks, and the 2007–08 crisis highlighted the importance of protecting domestic food markets from those shocks. Having seen the price of rice, wheat, maize and other grains double between 2007 and 2008, many import-dependent countries are now determined to become self-sufficient in these staple foods.⁵

India and Indonesia made similar commitments after the international food crisis of the early 1970s, and both were largely unaffected by the 2007–08 price surge.⁶ India, which was a major rice exporter before the onset of the latter crisis, banned rice exports and released national rice stocks into its domestic market, which helped stabilize domestic prices. Indonesia, which was operating close to self-sufficiency in rice, reduced the tariff rate on rice imports and lowered the value-added-tax (VAT) on its rice.⁷ It also initiated a production support program for its rice farmers to boost domestic rice supply. Most countries reliant on international rice trade followed similar measures between 2007 and 2008, but many were unable to avoid price volatility at home.⁸

The global trade context

The Uruguay Round of trade negotiations in the 1980s and 1990s committed member countries to formalize and eventually dismantle their non-tariff barriers (NTBs), such as the use of import quotas and other quantitative restrictions. The Uruguay Round also saw the commitment of countries to set tariff bounds, which were made legally binding with the establishment of the World Trade Organization (WTO), when the Agreement on Agriculture (AoA) came in to force.

Moreover, WTO members had to commit themselves to reducing applied tariff rates under specified time frames (see Box 1). The justification for this trade liberalization is usu-



A Mozambique market sells multiple brands of rice, imported and domestically produced.

The WTO Agreement on Agriculture

The Agreement on Agriculture (AoA) entered into force with the establishment of the WTO in January 1995. It has three pillars, which cover i) domestic support, ii) market access and iii) export subsidies. Under the first pillar, domestic support mechanisms are divided into three “boxes”:

Amber box: Direct support such as price support or production subsidies that distort trade. Under the AoA, members agreed to reduce direct support measures.

Blue box: Similar to the amber box, but specifically for direct support that limits production. There are no limits on blue box spending.

Green box: Support that does not distort trade (or only “minimally”): excludes price supports and must be government-funded. Includes environmental protection programmes and regional development programmes, for example. Spending on green box support is not limited.

Least Developed Countries (LDCs) are exempt from many of the requirements under the AoA.

ally that trade protectionism would lead to net welfare losses worldwide, and can also contribute to volatility in international markets. However, these steps by the WTO mean that countries also have fewer trade policy measures at their disposal to stabilize domestic prices in response to international price shocks.

Under WTO AoA rules, members are expected to reduce domestic policies that distort market prices (i.e. those under the “amber box”). The primary policy tools that governments would logically use to stabilize prices, which involves “distorting” (i.e. reducing) the transmission of high global prices onto domestic markets during crises, therefore run counter to WTO rules under the AoA. Countries are expected to use non-price-distorting policies such as direct cash transfers, food assistance and other mechanisms to increase consumers' access to food during price shocks.

Countries may also support producers through public programmes such as improving access to inputs, building irrigation systems, and improving farmers' access to extension support, training and other support mechanisms that do not directly affect output, and therefore prices (i.e. “green box” measures). The problem is that unlike tariffs and other trade restriction measures, these programmes require direct finance from governments. In contrast, tariffs actually generate government revenue – a sizeable share in many developing countries.

The norms of international trade associated with the General Agreement on Tariffs and Trade (GATT) and the AoA thus pose a number of challenges for developing countries trying to protect their people from international price shocks.

Yet trade also provides a form of security for developing countries. It is global trade that has facilitated access to cheap staple crops from countries with a comparative advantage in their production. Trade also enables countries to ac-



A bazaar in Bishkek, Kyrgyzstan, a country very dependent on food imports.

Photo: neilg/flickr

cess new markets when domestic harvests are lower than expected, such as during droughts, floods or other extreme weather events. In this sense, trade can increase countries' adaptive capacity, given the sensitivity of agriculture to climate conditions.

Measures to reduce dependence on trade, such as self-sufficiency policies, may still make sense for individual countries, but they can have negative system-wide effects – for example, on other import-dependent countries, as well as on exporters.⁹ More self-sufficiency means less overall trade and fewer participants in the market, which can increase the volatility of market prices.¹⁰ The same is true when producer countries impose trade measures to restrict their exports.

This conflict between what is rational at the national level, and the cumulative effect of changes in trade behaviour at the global scale, creates important challenges for decision-makers. Add to this the structural changes that have driven import-dependence and exposed many developing countries to volatile commodity prices, and it is clear that improving food price stability is a very complex task.¹¹

National strategies: the case of rice

Rice is a staple crop for more than half of the world's population. Many countries, particularly in West Africa, have pledged to become self-sufficient in rice, hoping to insulate themselves from international price shocks. In many cases, this requires expanding, nurturing, protecting or even creating new rice industries with complete value chains. The most import-dependent countries now have only marginal domestic rice markets, especially in rural areas where subsistence farming prevails. These countries are providing subsidies on inputs such as land, fertilizers and machinery, and introducing improved seed varieties, to encourage growth in rice production.

Least-developed countries have no restrictions on these forms of producer support, but rules under the WTO AoA prevent them from offering the same level of trade policy protection that most developed countries used historically to develop their own domestic agriculture sectors.¹²

Implementing measures to achieve self-sufficiency delivers benefits beyond food security. Self-sufficiency requires

the development of competitive domestic food value chains, which can be achieved by enhancing the mechanization of agricultural production and developing post-harvest sectors in food processing and even marketing and retail of domestic produce. This brings co-benefits to developing-country governments and people in terms of increased rural employment, increased scope for investment, and eventually higher tax revenues.

For these and other reasons, there is widespread agreement among UN agencies and development stakeholders such as the Food and Agriculture Organization (FAO) and World Food Programme (WFP) that agriculture-based development is the most effective way to reduce poverty and hunger and should be a key aim for many developing countries.¹³ However, many of the measures that governments would like to take to protect and develop their domestic food value chains fall within the “amber box” of the WTO AoA.

Another way to reduce vulnerability to global price volatility for key commodities is to diversify diets to reduce dependence on imported crops. Countries can help achieve this by developing effective and efficient domestic supply chains for non-rice crops such as vegetables and traditional staples. This would make those foods more competitive in terms of quality and price with imported goods. However, this approach has received much less attention from national governments than strategies to intensify the production (and processing) of current staple crops.

Regional cooperation also holds promise as a way to reduce vulnerability to global price shocks. But despite new regional agreements, progress has been slow in terms of implementing concrete solutions.

The 2014 Ebola crisis in West Africa has led to border closures and transport restrictions that have increased food prices in affected countries. This has re-emphasized the importance of regional cross-border trade to price stability and food security in regions such as West Africa, although policy and research attention is often more concentrated on domestic or global level prices and shocks.

The Economic Community of West African States (ECOWAS) could make a difference. ECOWAS operates as both a monetary and customs union, removing tariffs from trade among its members and aiming to set a common external tariff. This kind of regional cooperation could help member states in stabilizing regional prices. Governments could also take additional measures, nationally and via ECOWAS, such as easing access to credit, reducing transport and transaction costs, establishing a regional commodity exchange, improving storage, and dismantling other barriers, all of which would improve the integration between regional cereal markets and strengthen intra-regional trade.¹⁴

There are other regional-level strategies to address global food price volatility. For example, ECOWAS has proposed to set up a regional grain reserve which would release physical stocks and financial transfers to regions within West Africa affected by food crises.¹⁵ Since direct transfers do not directly distort market prices or favour domestic production, such steps fit within the “green box” of rules under the WTO AoA. However, more direct market interventions to control prices

– including the release of grain from strategic reserves in to regional markets – are not compatible with the AoA.

ECOWAS has also discussed the idea of organizing a regional rice buying cartel to increase the contract negotiating powers – and therefore price conditions – enjoyed by its members. In addition, it could strengthen its own capacity to survey global trade and provide early warnings of potential global shocks. However, these measures are not yet close to implementation.¹⁶

Despite – and in parallel to – the gradual development of such regional approaches, there has been a significant resurgence of calls for self-sufficiency in many rice import-dependent countries in West Africa and elsewhere. A key trigger for this resurgence is the volatility of global prices, most prominently the crisis of 2008, and the social and political disruption caused. But new threats lie ahead, not least the challenge of climate change, begging the question: Is self-sufficiency a sensible strategy to reduce vulnerability to price volatility in a changing climate?

The indirect and direct impacts of climate change on food prices

In its *Fifth Assessment Report*, the Intergovernmental Panel on Climate Change (IPCC) summarizes existing evidence on how climate change will affect food security and food production systems.¹⁷ With high confidence, the IPCC concludes that climate change has the potential to affect all aspects of food security, including food access and price stability. Climate change will increase inter-annual variability and – without adaptation – will negatively affect production of major crops such as wheat, rice and maize in most temperate and tropical regions.

In individual countries, climate change will have *direct impacts* on domestic agriculture, which could lead to price spikes in local markets and occasionally lead to shortages of domestically produced food. Countries with agricultural systems that are more exposed to these direct impacts and that are otherwise less able to adapt will be most vulnerable.

Combined with other underlying drivers such as rapid population growth and urbanization, climate change will also add to the volatility of agricultural commodity markets in future

and worsen the effect of price shocks on import-dependent countries. This dimension can be referred to as the *indirect impacts* of climate change on food security. Countries that are more dependent on food imports are likely to be more exposed to such indirect impacts.

Both direct and indirect impacts need to be addressed in countries' climate risk assessments and adaptation plans. Yet the most obvious adaptive response to one may increase vulnerability to the other: Countries wishing to avoid indirect climate impacts may seek to reduce their trade dependence, while concerns about direct climate impacts may lead countries to increase trade to hedge against the effects of poor harvests at home.

An adaptation strategy that seeks to address the risks from both indirect and direct impacts will need to strike a balance between the two, bolstered by other measures. Pursuing self-sufficiency, the most widely embraced policy in import-dependent countries, is unlikely to be the most robust solution in the context of future climate change.

Diversification as an appropriate adaptation response

One way to reduce exposure to any one risk is to diversify, creating more limited exposure to multiple sources of risk. In the business literature, for example, modern portfolio theory suggests that decisions should be based on the combined risk-reward characteristics of a set of investments, rather than the individual characteristics of each investment.¹⁸ The implication is that risks are reduced when investments are diversified across a range of choices – assuming that the associated risks do not overlap (e.g. when commodity prices vary independently of one another in different markets and are not exposed to the same storm or drought risks).

Diversification is particularly appropriate in conditions of high uncertainty, where knowledge about the risk-reward level of different investments or policies cannot be accurately calculated. This is the case with climate-related risks. There is significant uncertainty about the timing and magnitude of extreme weather events, the pattern of gradual climate change, and the success of adaptation across multiple agricultural systems in exporting countries around the world.



A rice harvest in Senegal.

Table - The differences between indirect international and direct domestic sources of food price risks for small, highly import-dependent countries.

	Indirect international	Direct domestic
Principal risk drivers	<ul style="list-style-type: none"> • Changes in international supply • Changes in international demand • Market dynamics (perception, buyer behaviour, exporter and importer policy responses) 	<ul style="list-style-type: none"> • Domestic supply (harvest, and processing capacity) • Regional cross-border trade
Scope and direction of impacts	Global to national <ul style="list-style-type: none"> • International flows directly influence domestic price (the degree of price transmission varies between markets) 	National <ul style="list-style-type: none"> • Domestic flows have little or no influence on international prices in highly import-dependent countries
Risk type	Likelihood: LOW Magnitude: HIGH	Likelihood: MEDIUM Magnitude: LOW to MEDIUM
Importing country government's influence on/control of risk	None <ul style="list-style-type: none"> • Importers are at the mercy of international drivers and responses from other buyers (e.g. other national rice boards) 	Moderate <ul style="list-style-type: none"> • Able to directly influence agriculture policy (driver of productivity) and policies to facilitate food processing sector (which convert domestic agriculture production into food commodities), but not to directly control prices at the farm gate • Unable to control climate variables, market price of inputs, etc.

For diversification to be useful for managing food security risks in a changing climate, the risks associated with “investments” – in this case the policy choices about how to source strategic food staples – would have to be different in their nature and not directly related to one another.

We identify two main types of climate risks relating to food price shocks: changing international flows affecting global commodity prices (indirect), and changes in domestic production (direct). While in exporting countries, these two risks may interact, in small import-dependent countries, they generally do not (see table above).

This analysis suggests that diversification is, indeed, a useful adaptation strategy for import-dependent countries seeking to reduce their exposure to both international and domestic price volatility. In practice, this means ensuring that the supply of staple foods comes from both imported and domestic sources; it might also be useful to diversify the sources of imports, where feasible, although this will not directly hedge against global commodity price changes. The appropriate balance of imports vs. domestic production will depend on national circumstances, such as potential domestic production capacity, the relative cost of domestic production vs. imports, and the value placed by decision-makers on increased control over prices (which is greater domestically).

The marginal cost and potential viability of domestic production vs. imports are key variables. At least initially, producing staple foods domestically will likely be costlier in import-dependent countries, relative to international market prices. Increasing domestic production and reducing imports will therefore come at a price – and will require government intervention. However, there may also be fiscal benefits in terms of saved foreign exchange reserves, as well as clear political and strategic benefits from retaining more influence over prices and thus avoiding social disruption and internal conflict. Furthermore, if populations that are now particularly vulnerable to food price shocks, such as the rural poor, are engaged in this new domestic food production, overall poverty and hunger may be reduced even if the resulting food prices are higher.

Senegal's approach: reducing vulnerability to rice price volatility

Diets in Senegal have changed significantly in the last 40 years. In 1975, millet was the most important staple, providing 28% of daily calories, followed by rice (20%), but sorghum, cassava and other staples were also widely consumed.¹⁹ Since then, consumption of millet, sorghum and cassava – all produced domestically – has declined, replaced by rice, which now provides around 30% of calories in Senegalese diets.

The shift is largely the result of changing lifestyles, including urbanization and an increase in wage-earning work. Rice is also more convenient, faster to cook than millet couscous and easy to store between periods of high and low prices. Thus rice is now the top staple food for people in both rural and urban areas. There is a strong preference for imported rice, which is considered higher-quality and a better value than the modest amount of rice produced in Senegal.²⁰

While Senegal's domestic rice production has been growing, it is dwarfed by increases in demand, leading to increased dependence on imports.²¹ Before the food crisis, in 2006, Senegal produced only 15% of its rice supply,²² making it highly exposed to price fluctuations in international rice markets.

Senegal imports its rice from Asia – chiefly Thailand and Vietnam. Much of Asia's rice production occurs in low-lying coastal and delta zones that will become increasingly exposed to sea-level rise, which may reduce the total land area for rice production in today's exporting countries.²³ Increasing drought risk and soil salinization also threaten rice production away from the coast.

The overall impact of climate change on rice production is very difficult to assess and will depend on local conditions and the adaptation response of governments and producers, which heightens uncertainty. Additionally, in all regions, production is expected to become more variable as a result of climate change.



Women on Fadiouth Island in Senegal prepare millet, a locally grown food staple, to make couscous.

The prospect of Senegal soon rising from least developed country (LDC) to a “developing country” also has implications for the country’s food security strategies, because LDCs are exempt from some of the targets in the WTO AoA (see box), but developing countries are not. Thus, achieving this development benchmark will reduce Senegal’s room for manoeuvre within the global trade architecture.

Stakeholders in Senegal have also expressed concern that using direct support to protect and develop the country’s high-potential rice sector would violate conditions attached to development assistance by major donors.²⁹ Senegal is also less

well-placed to use certain stabilization policies, such as direct subsidies for domestic rice prices, because of the financial drain this would place on public finances.

The Accelerated Programme for Agriculture in Senegal (PRACAS)

Recognizing its increasing vulnerability to volatile rice prices, the Senegalese government is pressing ahead with an ambitious strategy to become self-sufficient in rice by 2017. In 2014 Senegal expects to produce 350,000 tonnes of rice, just under a quarter of its domestic consumption (about 1,450,000 tonnes). Yet officials believe Senegal can achieve self-sufficiency by 2017 if it can produce an average of six tonnes per hectare along the Senegal River Valley (SRV), the “rice belt” where 80% of the country’s rice crop is now produced.³⁰ This implies cultivating all the available land in the wet season, plus a second crop each year – in the dry season – on at least half of rice paddy in the SRV.

The plans for achieving Senegal’s self-sufficiency target require expansion of rice production beyond this highly productive, irrigated rice belt. By 2017, 60% of national demand – mostly for urban areas – will be met by production from the SRV. The remaining 40% will be produced by rainfed systems in the rural areas south of the SRV, including expansion of existing smallholder rainfed rice production in the wet Casamance region in the far south, as well as the more marginal, dry peanut belt of central Senegal.

These drier Sahelian areas, which dominate Senegal’s landscape, are better suited to producing traditional staples such as sorghum and millet. Notwithstanding high barriers, ambitious agricultural research, extension programmes and food processing investments could potentially make such crops competitive with rice on local markets and thereby reduce vulnerability to rice price shocks by diversifying diets.

One reason that Senegal sees rice intensification as a smart strategy is that it is expected to be more resilient to climate

This added variability is problematic for a commodity that is already unusual among food staples in the structure of its market and the fluctuations of its price. Although in general international rice markets are not significantly more volatile than for other commodities, such as wheat and maize, the magnitude of shocks in rice prices – as witnessed in 2008 – has been significantly larger for rice.²⁴

What makes rice markets so unstable is the fact that as much as 95% of global rice production is consumed domestically, leaving a very small amount for international trade. There are also relatively few buyers and sellers, as governments – via national trading boards, rather than smaller private enterprises – tend to monopolize rice trade. Therefore, it only requires a small number of countries to suddenly enter or leave the international rice market to upset prices.²⁵

Senegal experienced this firsthand between 2007 and 2008 when India, a major rice exporter, banned rice exports. This led to panic buying by major rice importers (e.g. the Philippines) and further rice export restrictions by other major rice exporters (e.g. Vietnam) in order to stabilize their own domestic rice prices.²⁶ However, trade-dependent countries such as Senegal saw their own domestic prices skyrocket, leading to social instability and protests.²⁷

Senegal has relatively few trade policy tools available to protect itself from international rice price shocks. It went through a period of trade liberalization in the 1990s, as required by the International Monetary Fund (IMF), and reduced its use of tariff controls substantially. In the early 1970s food price crisis, Senegal temporarily reduced its tariff on imported rice, which had previously been at 29%,²⁸ and this successfully dampened the effect of international price increases on the prices at market stalls in Senegal. However, Senegal is now less able to employ such tariff controls because of its obligations to uphold free trade.

change than other staple crops grown in the region, because – within limits – it can be grown under minor flood conditions. New “Nerica” strains have been developed to improve resilience to drought and salinity, despite generally high water requirements. Officials also see rice as a more strategic crop because it can be easily stored, meaning that farmers have greater flexibility regarding whether or when to sell. However, diversification to include less thirsty traditional staple crops would contribute to climate resilience by spreading risks across multiple crops, as well as promoting more diversified and nutritional diets.

As part of the current strategy, the entire rice value chain is receiving attention, including post-harvest activities such as milling, processing and storage, although the emphasis remains on increasing production. With development aid assistance, Senegal is heavily subsidizing farmers with inputs such as machinery for harvesting and processing, and providing funding for improved storage. But policies which would be considered price-distortionary, such as providing minimum farm gate prices to farmers and setting higher trade restrictions on imported rice, are not being used to support Senegal’s domestic rice industry.

Senegal sees its self-sufficiency strategy not only as a way to insulate itself from international price shocks, but just as important, as an opportunity to boost a relatively undeveloped domestic industry to create jobs and contribute to the country’s economic growth, particularly in rural areas such as the Senegal River Valley.

Is Senegal’s strategy a sound one?

Intensifying domestic rice production will clearly help to address the indirect impacts of climate change by reducing dependence on imports and thus exposure to international price fluctuations. Senegal is well placed to pursue this strategy given its high domestic capacity for rice production.

However, by increasing domestic production – and specifically by aiming to produce 100% of Senegal’s rice domestically – the strategy increases exposure to direct climate impacts, reduces the diversity of Senegal’s agriculture and concentrates risks in one crop.

Expanding the area under rice cultivation also means that other crops will be displaced in an effort to meet this ambitious goal. Alternative crops can be a source of food or cash for food-insecure households, especially during rice price shocks.³¹ While politically prudent, when viewed through the lens of climate risk, the rice intensification programme thus carries the danger of “rice risk lock-in” for Senegal.

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Recommendations

- Import-dependent countries should aim to diversify their sources of risk by balancing imports with domestic production, where suitable. This requires investments in the whole food value chain – from farming and harvesting, to processing and marketing of domestic produce.
- Despite the political importance of price stability for staple crops such as rice, the focus should not be exclusively given to any one crop; “lock-in” to single crops may exacerbate climate change vulnerability for import-dependent countries.
- Diversifying agriculture and diets – for example, by improving the competitiveness of locally produced alternative staples – should also be seen as elements of a robust climate change adaptation strategy to maintain food price stability. Food diversification may also bring benefits in terms of nutrition security and enhanced coping capacity for households.
- Donors can play an important role in assisting countries to reduce their vulnerability to food price shocks, such as by investing in storage facilities and crop research. However, public finance can only go so far. Governments must seize opportunities to leverage private finance and private-sector participation, including, potentially, via climate finance mechanisms, particularly in the development of food supply chains.
- A much greater emphasis on trade and adaptation issues is needed in the global debate on climate change, including under the United Nations Framework Convention on Climate Change (UNFCCC), and in climate-related research. The Adaptation Committee should consider how to appropriately raise trade policy concerns, especially on behalf of LDCs, at the UNFCCC as well as the specific role of international institutions for adaptation related to trade.³²
- Given the low likelihood of achieving progress on trade-related issues at the UNFCCC, however, and the complexity and strategic interests that are at stake in agricultural trade negotiations, it is important to intensify research and policy dialogue on the role of trade dependence in climate vulnerability.

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