



CLIMATE CHANGE ADAPTATION AND TRADE

Policy brief

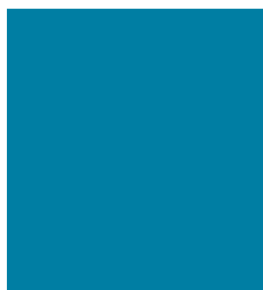
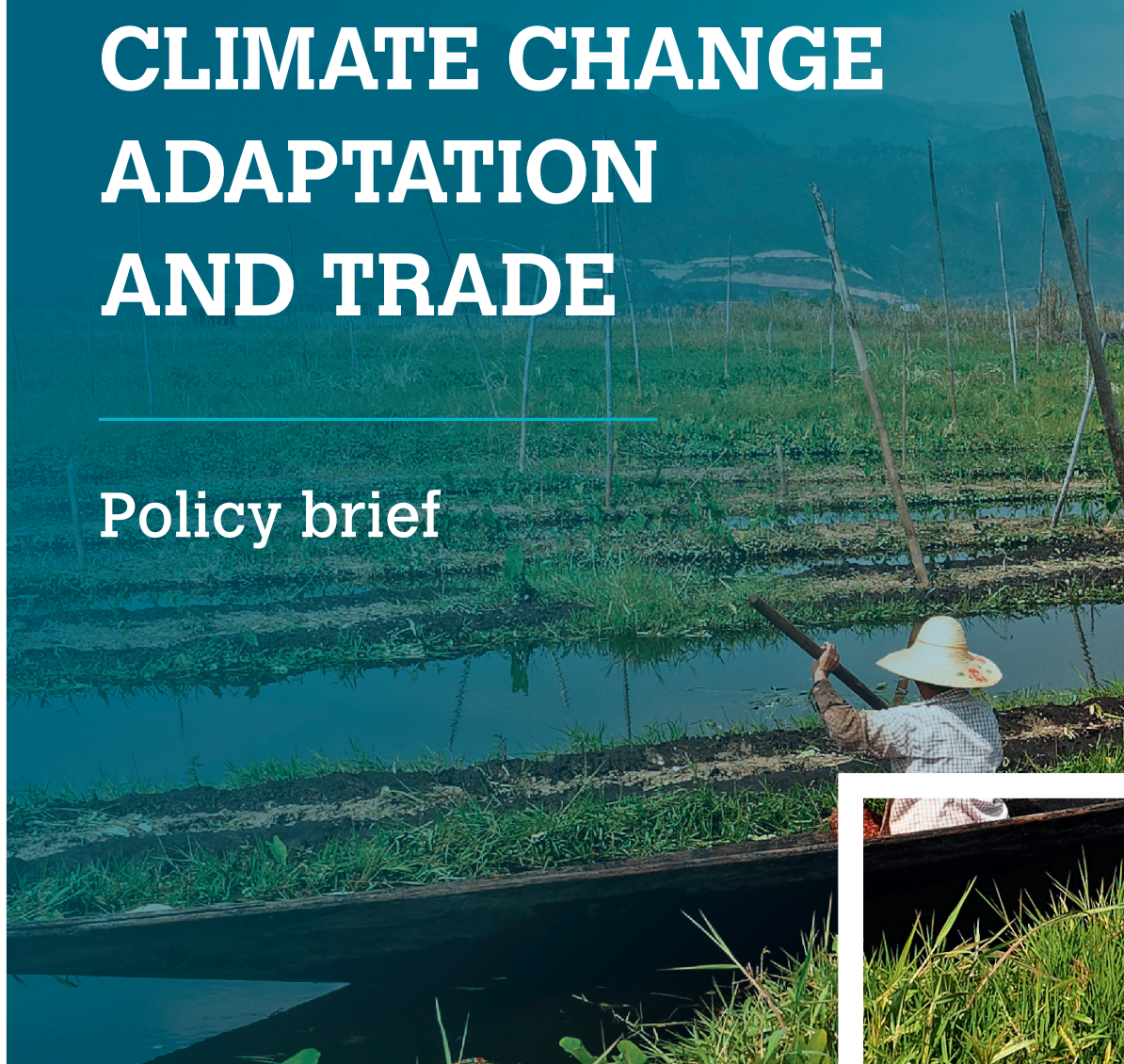


TABLE OF CONTENTS

1. INTRODUCTION	4
2. WHAT ARE THE IMPACTS OF CLIMATE CHANGE ON TRADE?	5
3. WHAT ROLE CAN INTERNATIONAL TRADE AND TRADE POLICY PLAY IN ADAPTING TO CLIMATE CHANGE?	6
4. HOW CAN INTERNATIONAL TRADE COOPERATION HELP TO MAKE CLIMATE ADAPTATION STRATEGIES MORE AMBITIOUS AND VIABLE?	8
REFERENCES	10

This policy brief is based on the forthcoming World Trade Report 2022, which will provide more detailed information on this and other topics related to trade and climate change.

The World Trade Report will be published in November 2022.

This Policy Brief and its contents are the sole responsibility of the WTO Secretariat, and do not reflect the opinions or views of members of the WTO.

CLIMATE CHANGE ADAPTATION AND TRADE

Policy brief

KEY POINTS

- Climate change is having profound impacts on international trade, which differ across regions and sectors. It can affect the comparative advantage of certain sectors, with agriculture, tourism and some manufacturing sectors being particularly vulnerable, and this can leave some countries and regions at a disadvantage with regard to others. In addition, as a result of climate change, trade costs are likely to increase across all regions, and this will leave small or landlocked countries, in particular, vulnerable to damage to their transport infrastructure.
- Trade can be part of the solution to help countries adapt to climate change because it fosters investment and economic development and provides opportunities for investment in adaptation actions. It can facilitate access to adaptation technologies, contribute to tackling food security challenges, and support countries in preparing for, responding to and recovering from climate shocks.
- Greater international cooperation, including at the WTO, is key to strengthen the climate resilience of supply chains, address climate-related food security challenges, and deliver the technical assistance and investment required to climate-proof infrastructure and upgrade productive capacities.

1. INTRODUCTION

Climate change is having a major impact on the environment, people and, as a result, the global economy. Global warming, rising sea levels and extreme weather events are affecting lives, livelihoods and ecosystems around the world. Vulnerable populations in developing countries, particularly in small-island developing states (SIDS), will likely bear the brunt of climate change disproportionately due to their greater geographical exposure and their relatively lower resilience and adaptive capacities.

Global warming and extreme weather events also pose a severe threat to international trade. Export losses are expected to be much higher in regions that are highly exposed and vulnerable to weather-related hazards, such as Africa, the Middle East, and South and Southeast Asia. Many of the consequences of climate change are already difficult to reverse. Adapting to the changing climate and its cascading impacts is therefore a sustainable development imperative. Adapting to climate change requires actions that reduce the negative impact of climate change, while taking advantage of potential new opportunities. It involves adjusting policies and actions in line with observed or expected climate changes.

This policy note addresses three important questions:

- What are the impacts of climate change on trade?
- What role can international trade and trade policy play in climate change adaptation?
- How can international trade cooperation help to make climate change adaptation strategies more ambitious and viable?

2. WHAT ARE THE IMPACTS OF CLIMATE CHANGE ON TRADE?

Climate change impacts regions and sectors in different ways; consequently, some regions and sectors are more exposed and vulnerable to its consequences. In the short term, the damage caused by climate change-related extreme weather events can reduce productivity, increase trade costs and cause supply chain disruptions. In the long term, climate change can affect trade by altering countries' comparative advantages and thus their production specialization.

Trade costs are likely to increase unevenly across regions as a result of climate change. One of the reasons for this is that transport infrastructure, such as roads, inland waterways and railway lines, is at risk of faster depreciation and of damage, necessitating higher spending on operating, maintaining and repairing this infrastructure. Critical junctures of transport routes are those most vulnerable to trade disruptions, and small economies or landlocked countries which receive trade flows through a limited number of ports and trade routes are especially vulnerable to impacts of climate change on transport infrastructure.

Small economies or landlocked countries are especially vulnerable to impacts of climate change on transport infrastructure.

Agriculture is the sector that is the most exposed and vulnerable to climate change. Sub-Saharan Africa and South Asia are expected to experience larger negative agricultural yield shocks compared to other regions. Empirical evidence suggests that the export growth of agriculture products from low-income economies could decrease by up to 5.7 per cent in response to a 1°C temperature increase (Jones and Olken, 2010). Agricultural trade volatility and food security concerns are likely to increase further due to the risk of the simultaneous failure of crop systems in multiple food-producing countries.

The tourism sector also remains particularly vulnerable to climate change. Traditional summer destinations may lose appeal as summer months become increasingly hotter, while warmer winters are a risk to winter and mountain destinations. Rising sea levels and extreme weather conditions could also permanently damage tourism infrastructures, with economies that are highly dependent on tourism, such as SIDS, likely to be the worst hit.

Increasingly extreme weather events are likely to impact manufacturing hubs, and may cause important cascading effects along supply chains.

Climate change can lead to supply chain disruptions in manufacturing sectors. While manufacturing tends to be less vulnerable to climate change, sectors dependent on climate-sensitive inputs (such as food processing), labour-intensive sectors, and sectors that are highly integrated into global value chains are more vulnerable to climate change. Increasingly extreme weather events are likely to impact manufacturing hubs, and may cause important cascading effects along supply chains.

Climate change will alter comparative advantages, leaving some countries at a greater disadvantage. A 2.5°C increase in global temperature by 2060 could decrease export volumes by as much as 5 to 6 per cent for countries in South Asia and Sub-Saharan Africa, by 3 to 4 per cent for the Middle East, North Africa, and South-East Asia, and by 2 per cent in Latin America, compared with less than 1 per cent in Europe and North America (Dellink, Hwang, et al., 2017). Factors such as commodity dependence and lack of diversification can exacerbate vulnerability to climate change and make it more difficult for countries to develop comparative advantages in other sectors.

3. WHAT ROLE CAN INTERNATIONAL TRADE AND TRADE POLICY PLAY IN ADAPTING TO CLIMATE CHANGE?

International trade can play an essential role in climate risk prevention, reduction and preparedness.

Adapting to climate change requires an understanding of the challenges and opportunities occasioned by climate change, as well as an ability to anticipate, evaluate and manage climate-related risks. Trade can support climate change adaptation measures in four ways.

First, trade can support climate change adaptation actions through economic growth.

International trade can indirectly help economies to steer some of their financial resources towards climate change adaptation actions. For example, developing economies that have facilitated trade have been found, as a consequence, to have experienced a 1 to 1.5 per cent higher economic growth rate (Irwin, 2019). The gains from trade can provide additional financial support to invest in climate change adaptation strategies, such as climate-resilient infrastructure.

The gains from trade can provide additional financial support to invest in climate change adaptation strategies.

Second, trade and trade policy can enhance economic resilience to climate change-related shocks.

Trade in services like weather forecasting, insurance, telecommunications, transportation, logistics and health services can play an important role in preparing for climate-related shocks. Once a climate-related shock hits, trade can help to provide access to essential goods and services, such as food and medical supplies. For example, in response to the devastating 2022 floods in Pakistan, the government has temporarily eliminated taxes and import duties on items used in flood relief operations. Trade can also contribute to speeding up the economic recovery and reconstruction from such shocks thanks to sustained foreign demand on the export side and the availability of intermediate and capital goods on the import side.

Third, trade can support efforts to alleviate climate change-induced food insecurity.

Trade can help to bridge supply-and-demand gaps in regions experiencing rising or falling crop yields as a consequence of climate change. Therefore, it can contribute to improving food security in a number of ways, including by improving food availability, nutrition, access and utilization.

Fourth, trade can facilitate the diffusion and development of technologies that can help with adaptation to climate change.

International trade can spur innovation by opening up new market opportunities for climate adaptation solutions. Global value chains can also stimulate innovation through international knowledge spillovers. In addition, trade can drive down the costs of climate change adaptation technologies by encouraging efficiency, economies of scale and learning-by-doing.

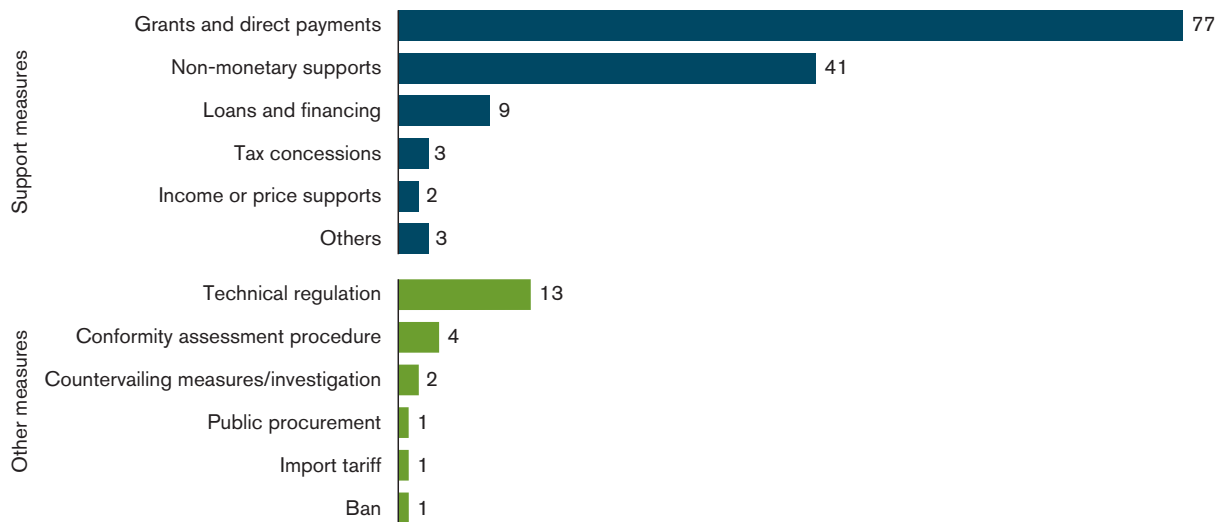
International trade can spur innovation by opening up new market opportunities for climate adaptation solutions.

Trade policies can be an integral part of climate change adaptation strategies.

While well-designed trade policies can support climate change adaptation efforts, countries exposed to climate change tend to face higher trade costs, which could prevent smooth trade-related adjustments. For instance, simulation analysis suggests that phasing out agricultural tariffs and implementing other trade-facilitating measures instead, including efficient customs clearance and transit procedures, could reduce the impact of climate change on undernourishment by up to 64 per cent in 2050, meaning that as many as 35 million fewer people would suffer from hunger (Janssens et al., 2020).

A review of all environment-related notifications submitted by WTO members reveals that a limited number of climate change-related trade measures, namely 161 out of 897 (18 per cent), can be linked to climate change adaptation. These trade-related climate change adaptation measures predominantly take the form of support measures, followed by technical regulations and conformity assessment measures (see Figure 1). More than half of the notified climate change adaptation measures cover the agricultural sector, illustrating its vulnerability to climate change and its need to adapt.

Figure 1: Support measures are the most common trade-related climate change adaptation measures



Source: Authors' calculations, based on the WTO Environmental Database.

Note: The figure reports climate change adaptation measures notified to the WTO between 2009 and 2020 by types of policies. One notified measure can cover more than one type of policy.

Addressing the factors and conditions underpinning vulnerabilities and exposures to climate risks is important. Trade alone is not a panacea to adapt to the highly disruptive consequences of climate change. While the disruptions caused by climate change are unlikely to be fully avoided, well-functioning markets, including in the areas of infrastructure, food, financial services and labour, may offer some solutions. For example, labour market policies can play a key role in mitigating some of the disruptions in the labour market that will be caused by the expansion of some sectors and the contraction of others as a consequence of climate change. Social policies, for example in areas such as education and social learning, can also contribute to making climate change adaptation more inclusive by improving access to the practical and technical skills needed to adopt and implement climate change adaptation strategies.

4. HOW CAN INTERNATIONAL TRADE COOPERATION HELP TO MAKE CLIMATE ADAPTATION STRATEGIES MORE AMBITIOUS AND VIABLE?

International cooperation in climate change adaptation is essential to leverage synergies and limit undesired impacts. Coordinating preparedness and responses to climate shocks, and assisting the countries most affected, particularly developing economies, in their adaptation efforts is key. International cooperation on climate adaptation is broad and diverse. While the United Nations Framework Convention on Climate Change (UNFCCC) is at the forefront of coordinating global climate change adaptation efforts, the UN 2030 Sustainable Development Agenda has recognized the need for the widest possible international cooperation to combat climate change. However, although adaptation initiatives are supported by different financial mechanisms, climate finance fell short of its US\$ 100 billion goal for 2020, and has not achieved the balance between adaptation and mitigation finance called for in the Paris Agreement (UNEP, 2021). Climate adaptation finance only represented 36 per cent of total climate finance in 2019. Adaptation finance is particularly important for the poorest and most vulnerable countries, representing more than 40 per cent of climate finance for least-developed countries (LDCs) and SIDS.

Adaptation finance is particularly important for the poorest and most vulnerable countries.

International cooperation on trade can further support and enhance climate change adaptation actions.

A limited but increasing number of trade agreements explicitly addresses climate change adaptation, covering various commitments, from adopting adaptation measures to facilitating the removal of trade and investment barriers to goods and services that can contribute to adaptation. Provisions on climate change adaptation are sometimes complemented by other explicit provisions addressing natural disasters (WTO, 2021). The WTO, through its different functions, can also help to support climate adaptation efforts by promoting the transparency and predictability of trade policies related to climate change adaptation and by limiting unnecessarily trade-restrictive policies.

The WTO can improve the climate resilience of supply chains by helping to make trade more open, predictable and diversified.

A broad range of strategies can be adopted to support resilience. Substituting critical inputs, stockpiling, maintaining redundancy in the production process (i.e., additional production capacity in case of need), and diversifying products, suppliers and markets are potential strategies. Pooling information and sharing expertise can also contribute to making supply chains more resilient to climate change. The WTO supports the conditions underpinning the climate resilience of supply chains by reducing trade barriers, streamlining customs procedures, and encouraging the transparency and predictability of trade policies, including those related to climate change adaptation. Several WTO bodies, in particular the Committee on Trade and Environment (CTE), also provide a forum to support policy dialogue and experience-sharing in trade-related climate change adaptation strategies.

The WTO could help to improve the climate resilience of supply chains in a number of areas. For example, further enhancing the existing WTO transparency mechanisms would facilitate the decision-making processes of firms and governments by providing timely access to relevant information, particularly when climate-related shocks hit. Clarifying the appropriate use of export restrictions of critical materials or intermediate inputs would also reduce policy uncertainty and risks in supply chains. Advancing the WTO Trade and Environmental Sustainability Structured Discussions (TESSD) could promote concrete actions to support sustainable supply chains and trade-related climate change adaptation strategies.

The WTO can help to alleviate food insecurity, including that caused by climate change. WTO rules strive to limit trade distortions and unnecessary trade barriers, including export restrictions and trade-distorting subsidies in agricultural markets, thereby ensuring that food is produced as efficiently as possible and that it can move as freely as possible from food-surplus to food-deficit regions. At the same time, the WTO Agreements also allow WTO members to implement sanitary and phytosanitary measures to ensure food safety – provided that these measures do not unjustifiably discriminate between domestic and foreign producers – as climate change can increase the incidences and spread of animal and plant diseases. The Agricultural Market Information System (AMIS), a platform of international agencies including the WTO, tracks the supply of key agricultural commodities and provides a forum for coordinated policy responses when needed.

WTO rules strive to limit trade distortions and unnecessary trade barriers, including export restrictions and trade-distorting subsidies in agricultural markets.

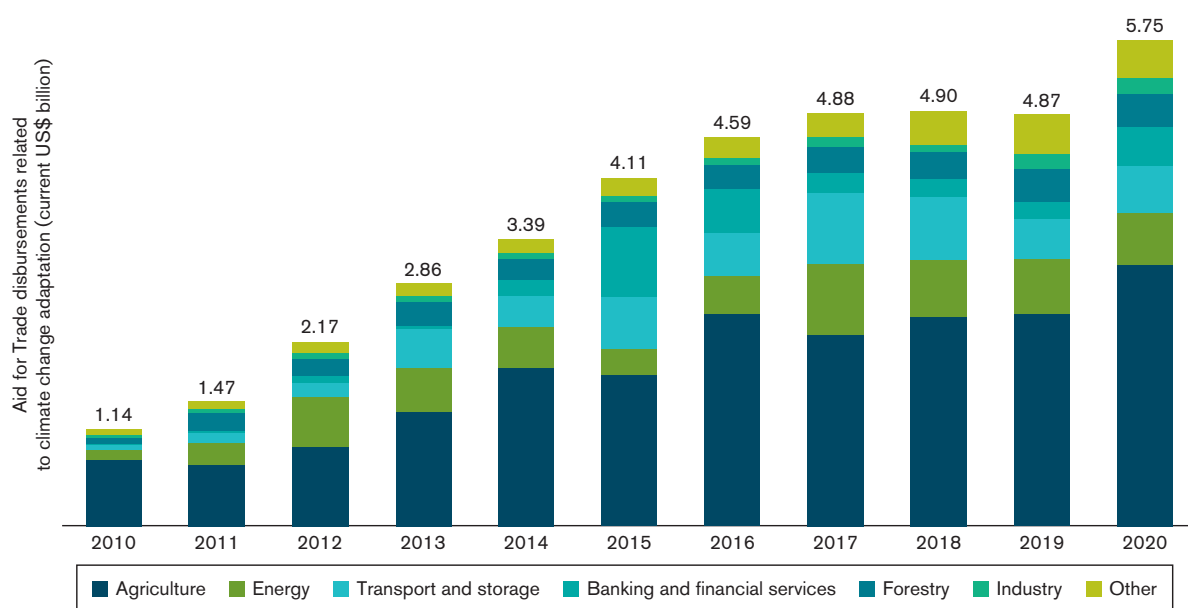
The WTO could further support efforts to address food security challenges, including those arising from climate change.

At the twelfth Ministerial Conference (MC12) in June 2022, WTO members agreed to exempt from export restrictions food bought by the World Food Programme for humanitarian purposes. Ministers also pledged to facilitate trade in food, fertilizers and other agricultural inputs, and to cooperate on enhancing

productivity. Implementing this decision could contribute to managing the knock-on effects of surging food prices during a crisis, thus increasing food security. Finding a permanent solution to food security and public stockholding could also enhance the predictability of agricultural markets. Enlarging the scope of AMIS, which currently focuses on wheat, maize, rice and soybeans, could help to further improve transparency on agricultural markets.

Capacity-building and technical cooperation can help developing countries, in particular LDCs, to build climate-resilient trade capacity and infrastructure. The WTO supports the transfer of relevant technologies to developing countries, including those related to climate change adaptation, in line with WTO members' obligations under the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (the TRIPS Agreement). In addition, a limited but increasing number of Aid for Trade projects, representing around US\$ 5.75 billion, or 12 per cent of total Aid for Trade disbursements in 2020, have also been allocated to projects related to climate change adaptation. While more than half of adaptation-related Aid for Trade disbursements target the agricultural sector, other adaptation-related Aid for Trade projects focus on energy, transport and storage, banking and financial services and forestry sectors (see Figure 2). Aid for Trade initiatives, such as the Enhanced Integrated Framework (EIF) and the Standards and Trade Development Facility (STDF), are increasingly helping LDCs and other vulnerable developing countries to build their trade-related adaptation capacity.

Figure 2: Most Aid for Trade disbursements related to climate change adaptation cover agriculture



Source: Authors' calculations, based on the Organisation for Economic Co-operation and Development (OECD) DAC-CRS (Development Assistance Committee Creditor Reporting System) Aid Activities Database.

More can be done to better exploit synergies between climate finance and Aid for Trade to help low-income and vulnerable countries to address the challenges of climate change adaptation. The Aid for Trade initiative could help to mobilize additional funding for climate change adaptation by assisting countries in better integrating the trade dimension into countries' national adaptation strategies and more systematically integrating climate risks into Aid for Trade projects. Strengthening discussions in the WTO on the trade-related adaptation needs of developing countries and LDCs could also contribute to a higher degree of alignment and coherence between Aid for Trade and climate finance programmes.

REFERENCES

Dellink, R., Hwang, H., Lanzi, E. and Chateau, J. (2017), "International Trade Consequences of Climate Change", OECD Trade and Environment Working Papers No. 2017/01, Paris: Organisation for Economic Co-operation and Development

Irwin, D. A. (2019), "Does Trade Reform Promote Economic Growth? A Review of Recent Evidence", PIIE Working Paper No. 19-9, Washington, D.C.: Peterson Institute for International Economics (PIIE).

Janssens, C., Havlík, P., Krisztin, T., Baker, J., Frank, S., Hasegawa, T., Leclère, D., Ohrel, S., Ragnauth, S., Schmid, E., Valin, H., Van Lipzig, N. and Maertens, M. (2020), "Global Hunger and Climate Change Adaptation Through International Trade", *Nature Climate Change* 10(9):829-835.

Jones, B. F. and Olken, B. A. (2010), "Climate Shocks and Exports", *American Economic Review* 100(2):454-59.

United Nations Environment Program (UNEP) (2021), *Adaptation Gap Report 2021: The Gathering Storm – Adapting to Climate Change in a Post-Pandemic World*, Nairobi: UNEP.

World Trade Organization (WTO) (2021), *World Trade Report 2021: Economic Resilience and Trade*, Geneva: WTO.

Report designed by Graphic and Event Design,
Print and Distribution Section.
Printed by the WTO Secretariat.

Image credits:

Cover page: Floating farm on Inle lake, Myanmar.

© Ian Crocker/Shutterstock

© World Trade Organization 2022



WORLD TRADE
ORGANIZATION

World Trade Organization
Centre William Rappard,
Rue de Lausanne 154,
CH-1211 Geneva 21, Switzerland
Website: <https://www.wto.org>

Find out more

