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A CRITICAL REVIEW

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Sustainability Impact Assessments of Free Trade Agreements: A Critical Review

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Trade negotiations are frequently accompanied by sustainability impact assessment (SIA) to evaluate the potential economic, environmental, social and human rights effects of a possible agreement. SIAs can help promote environmental protection, and support the better integration of women, vulnerable populations, and small businesses into the global economy, as well as address growing concerns from civil society. They provide a critical opportunity for dialogue among stakeholders and trade policy makers, and thereby help to rebuild confidence in the trading system. However, SIA approaches – including economic modelling, qualitative causal chain analysis and stakeholder consultations – each have their strengths, challenges and limitations. Those need to be understood by policy makers if reliable and policy relevant conclusions are to be provided. This paper offers a perspective on the challenges and opportunities of various approaches and discusses best practices for assessing the sustainability impact of trade and trade agreements.

Key words: Trade liberalisation; sustainable growth; CGE models; stakeholder dialogue; qualitative methods

JEL codes: A13, B41, F13, F18, F6

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Executive Summary

Although international trade policies are increasingly seen as part of the toolkit for sustainable development, whether trade will have a positive or negative impact on people and the environment will depend on a number of economic and policy factors, both domestic and international. Aiming to better understand those factors, a number of countries undertake prior impact assessments when negotiating trade agreements, to analyse the potential environmental, social and, increasingly, human rights effects of these agreements. These *ex ante* sustainability impact assessments (SIAs) can help countries identify and pursue the best possible sustainable development outcomes, determine any necessary accompanying policies or reforms at the domestic level and provide an opportunity for dialogue among stakeholders and trade policy makers.

Different countries follow different approaches to assessing in advance the sustainability impacts of trade agreements; it is important for any approach to be suited to the circumstances at hand. In order to make informed decisions about the scope and methods that can be most appropriately applied, countries need to understand the conditions, opportunities, challenges and risks of available methods.

Trade SIAs may explore a range of sustainability dimensions depending on the capacity and policy priorities of the countries involved, and generally focus on the most likely and most salient potential impacts.

The assessment of environmental impacts focusses on the product, technology, scale, structural and regulatory effects of trade measures or agreements – and on the interrelations between those effects, which may even out potential negative and positive impacts. Given the frequent transboundary or global reach of environmental impacts, a wider assessment scope is often warranted, calling for internationally comparable data. However, there are often shortcomings in available data.

Labour impacts generally hinge on the required employment and wage adjustments of labour markets, due to the reallocation of resources to the most productive firms and activities, along with increased technology adoption and knowledge spillovers. Simplifying assumptions about frictionless labour markets or the share of informality may affect the reliability of outcomes, while an SIA that goes beyond the jurisdiction of the assessing country may also suffer from data shortcomings. Other social impacts, including on gender equality and on vulnerable groups are frequently considered through a labour impact lens or involve significant human rights considerations.

The assessment of human rights impacts is a relatively recent innovation, and is still subject to some scepticism about its practicality and policy usefulness, including because of the limited applicability of quantitative methods and the difficulty in establishing measurable outcomes. The risk of attributing a larger role to a trade agreement when potential positive or adverse impacts may be due to a whole array of other factors, including migration, technology, the digital transformation or the political priorities and systems of the partner countries, further affects the relevance of assessment outcomes.

Trade SIAs typically employ a mix of quantitative, qualitative and hybrid methods that complement each other in evaluating a comprehensive set of outcomes. Each of the methods has merits and limitations.

As a starting point, most trade SIAs employ a computable general equilibrium (CGE) model to assess the aggregate economic effects of the agreement, increasingly incorporating environmental and social outcomes. While this framework can deliver objective, robust and measurable information, enabling the assessment of potential trade-offs and providing clear policy guidance, it can only directly integrate

sustainability indicators to a certain extent and tends to be highly aggregated. Modelling changes in tariffs and quotas is relatively straightforward but the quantification of non-tariff measures, many of which may affect sustainability outcomes, is more complex. CGE models are thus often complemented with microeconomic modelling and case studies focused on one specific sustainability outcome; and with complementary qualitative approaches to analyse complex causal linkages, such as those related to biodiversity, and sustainability-relevant regulatory and institutional impacts. The former can add nuance, detail, and depth in relation to policy areas or sectors of particular importance and the latter may provide well-informed, practical suggestions, even if they present their own challenges of bias or capture. Among them, stakeholder consultations can be an important means of gathering more granular evidence not available via other methods, while offering a critical path for enhancing dialogue and trust between policy makers and society, promoting greater awareness and building support for the negotiated provisions.

However, *ex ante* economic modelling is sensitive to assumptions about economic interactions as well as to the numerous parameters that guide them, thus building realistic scenarios is paramount. Furthermore, there are significant difficulties in establishing and articulating causal links between sustainability issues and the change in trading arrangements between two countries, while distinguishing the impact on the former of unrelated factors, such as technological change or failures in domestic governance. A range of estimates based on different scenarios can improve the robustness of policy recommendations. On the other hand, complex quantitative approaches that can deliver a robust basis for policy guidance require a range of technical capabilities and expertise that is not available in all administrations, as well as reliable data.

This makes trade SIAs a resource-intensive and costly exercise. Constraints on resources and logistical challenges impact the amount of research and analytical work that can be carried out, with implications for the reliability and credibility of findings. Costs and logistical challenges are compounded in the case of “extraterritorial” impact assessments.

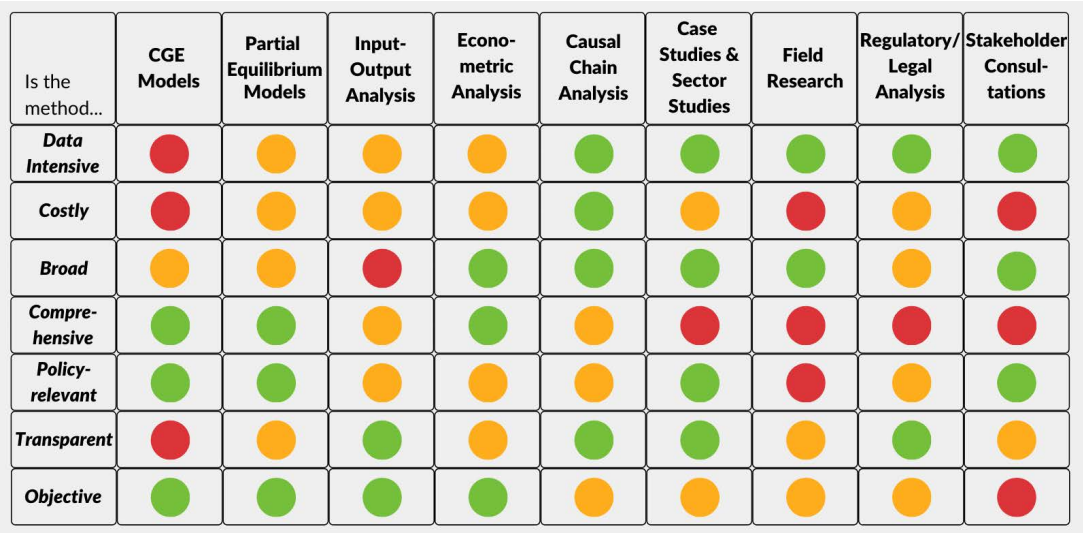
In order to make informed decisions about the various approaches and analytical methods for conducting trade SIAs in line with their specific circumstances, policy makers need to keep in mind those methods’ strengths and limitations, including:

- How complex and resource intensive methods are
- How wide-ranging the scope of their analysis can be
- How well they guide or can translate into policy recommendations
- How comprehensive they are in enabling assessment of trade-offs, and
- How easy it is to understand what drives results.

The principle of “proportionate analysis”, i.e. channelling analytical resources commensurate to the potential implications of the agreement under negotiation is even more important where the assessing economy is smaller, and expecting relatively small economic effects to translate into limited sustainability impacts, including outside its domestic jurisdiction.

Finally, it is important to keep in mind that even when SIAs apply complex assessment methods there are limits to what they can achieve. They serve to inform and guide public policy discussion but they may lack the details necessary to formulate concrete policies. Furthermore, trade agreement provisions cannot bring about positive or negative sustainability effects in isolation, but will greatly depend on their domestic enforcement as well as on non-trade policies and other factors in mitigating or compounding those effects.

Typical strengths and limitations of available SIA methods



Is the method...	CGE Models	Partial Equilibrium Models	Input-Output Analysis	Econo-metric Analysis	Causal Chain Analysis	Case Studies & Sector Studies	Field Research	Regulatory/ Legal Analysis	Stakeholder Consul-tations
Data Intensive	🔴	🟠	🟠	🟠	🟢	🟢	🟢	🟢	🟢
Costly	🔴	🟠	🟠	🟠	🟢	🟠	🔴	🟠	🔴
Broad	🟠	🟠	🔴	🟢	🟢	🟢	🟢	🟠	🟢
Compre-hensive	🟢	🟢	🟠	🟢	🟠	🔴	🔴	🔴	🔴
Policy-relevant	🟢	🟢	🟠	🟠	🟠	🟢	🔴	🟠	🟢
Transparent	🔴	🟠	🟢	🟠	🟢	🟢	🟠	🟢	🟠
Objective	🟢	🟢	🟢	🟢	🟠	🟠	🟠	🟠	🔴

Note: The table presents a general assessment of typical strengths (in green) and limitations (in red) of available SIA methods. They may be upheld to a greater or lesser extend according to the specific characteristics of the agreement under assessment.

1. Introduction

Over the past three decades, international trade policies are increasingly explicitly linked to the objective of supporting sustainable development.[1] Trade is specifically cited as a key means of implementation of the Sustainable Development Goals (SDGs).[2] It is nevertheless also recognized that there is no immediate and automatic relationship between trade and the achievement of these goals: the impact of global trade on people depends both on the national policy settings and the production structure of the economy in the countries in which they live, and on the nature and degree of international economic cooperation (OECD, 2017[1]). Bilateral, plurilateral and multilateral trade agreements have, in particular, attracted criticism from various constituencies about their potential negative impact on sustainable development. In a number of countries, policy makers undertake prior assessments of the potential impacts of trade agreements on sustainable development, both to inform negotiations in order to help achieve the best possible sustainable development outcomes, and to assist in identifying any necessary accompanying policies or reforms at the domestic level. These assessments can also serve as an important opportunity for dialogue among stakeholders and trade policy makers.

[1] See for instance the preamble to the WTO Agreement. The Decision establishing the WTO Committee on Trade and Environment (CTE) stated that "(*t*)*here should not be, nor need be, any policy contradiction between upholding and safeguarding an open, non-discriminatory and equitable multilateral trading system on the one hand, and action for the protection of the environment, and the promotion of sustainable development on the other*"

[2] SDG 17 "Strengthen the means of implementation and revitalise the global partnership for sustainable development". The Addis Ababa Action Agenda on Financing for Development, calls trade an "engine for development," and pledges to "integrate sustainable development into trade policy at all levels."

The OECD Guidance on Sustainability Impact Assessment (OECD, 2010[2]) defines Sustainability Impact Assessments (SIA) as "an approach for exploring the combined economic, environmental and social impacts of a range of proposed policies, programmes, strategies and action plans". The Guidance particularly stresses the importance of SIAs in "developing integrated policies … which include cross-cutting, intangible and long-term considerations" and acknowledges the varying levels of ambition, range of tools, methods, models or appraisals that can be used.

A number of countries undertake *ex ante* economic assessments of Free Trade Agreements (FTAs) and some include environmental and labour considerations. However, *ex ante* assessments covering broader sustainability issues, as reflected in the SDGs, are undertaken or considered by only a handful of economies, including the European Union, Canada, Switzerland[3] and the United Kingdom.[4]

Further, any approach to undertaking *ex ante* impact assessments must be suited to the specific circumstances at hand. Methods that have been applied or advocated in one context – whether in the context of SIAs undertaken by the European Union or SIA-like assessments undertaken by Canada, the Economic Commission for Latin America and the Caribbean (ECLAC) or the United Nations Environment Program (UNEP) – would not necessarily be suited to other contexts or circumstances. In particular, the degree of openness of the economy undertaking the assessment and its size, both in absolute terms and relative to the negotiating partner, may influence the relevance and robustness of the assessment and its value for money. A small, open economy will not necessarily draw the same insights as a larger economy or one with wider margins for trade liberalisation. Therefore, for countries interested in undertaking *ex ante* SIAs of their future trade agreements, it is important to better understand the conditions, opportunities, challenges and risks of available methods in order to make informed decisions about the scope and methods that can be most appropriately applied.

To help with these reflections, the document presents a critical review of existing approaches and methods for performing *ex ante* SIA of FTAs, laying out the process, discussing the strengths and weaknesses of various approaches, including for small, open economies. The next section sets the scene, identifying the broad sustainability aspects falling under the scope of an SIA. Section 3 discusses the main analytical methods that are used in SIAs or SIA-like analysis undertaken upstream of FTA negotiations, and critically reviews the strengths of these methods, and their limitations in delivering policy relevant insights and conclusions. Section 4 highlights the main trade-offs policy makers face when relying on the reviewed methods. The final section concludes with the main points to recall when undertaking a SIA, especially in the context of a small, open economy.

[3] See the assessment of the potential environmental impacts resulting from an FTA between EFTA and MERCOSUR (Francois et al., 2020[60]).

[4] See for instance the scoping assessments for the UK-Australia (UK Department for International Trade, 2020[132])and the UK-New Zealand FTAs (UK Department for International Trade, 2020[133]). In December 2020, the UK House of Lords also sought – unsuccessfully – to amend legislation on post-Brexit trading arrangements to require a prior assessment of the sustainability impact of such arrangements. The amendment called to "produce a sustainability impact assessment including, but not limited to, an assessment of the impact of the proposed negotiating objectives on human, animal or plant life or health, animal welfare, environmental protection, human rights and equalities, and employment and labour". See https://publications.parliament.uk/pa/bills/lbill/58-01/164/5801164.pdf.

2. Sustainability dimensions to consider

While there is no broadly accepted set of sustainability "outcomes" that should be the subject of an SIA, some common elements emerge from the literature. These can be roughly categorised into economic, environmental and social dimensions and their corresponding indicators. A separate, human rights dimension has emerged more recently, although this dimension overlaps to a certain extent with the other dimensions.

The economic impacts of trade agreements are well documented and their analysis is rooted in established methodological frameworks. The other dimensions, on the other hand, have so far received less attention. This document therefore puts emphasis on the discussion of methodologies for *ex ante* impact assessments of these other – environmental, social and, especially, human rights impacts. As the human rights dimension is relatively less explored, the characteristics, indicators and available sources of information for this dimension are mapped out in greater detail.

2.1. The economic dimension

As trade agreements, by definition, primarily affect economic variables, their sustainability impacts are thus directly and indirectly related to these changes in economic activity. Trade liberalization can contribute to higher productivity and welfare due to more efficient allocation of resources, greater economies of scale and greater product variety. It may also enhance long run economic growth by incentivizing firms to invest more in innovation and by facilitating the diffusion of knowledge and technology transfer.

Economic effects of trade agreements depend on the size of the trade partners, their level of trade openness prior to the agreement as well as the ambition of the trade agreement. For instance, the aggregate economic effects of lower tariffs between a small and a large economy are likely to be sizeable for the former but small for the latter. However, even small economies may be important importers or exporters of certain products and trade liberalization of those particular products may thus affect their partners' economic outcomes.

Ex post empirical literature on the economic impact of trade liberalization follows two main approaches. The first approach uses econometric analysis to provide evidence on specific channels that may lead to higher welfare. For instance, trade agreements implemented by the European Union between 1993 and 2013 increased the product quality of imports by 7% on average, leading to a cumulative reduction in the consumer price index of 0.24% (Berlingieri, Breinlich and Dhingra, 2018[3]). Foreign supermarket entry into Mexico led to lower prices and larger product variety, boosting the average household welfare by 6% (Atkin, Faber and Gonzalez-Navarro, 2018[4]). India's tariff liberalization in the early 1990s improved Indian firms' access to a larger variety of intermediate inputs which led to more product innovation (Goldberg et al., 2010[5]). A 10 percentage point decrease in Indonesia's tariffs led to 12% increase in productivity of Indonesian firms that import their inputs (Amiti and Konigs, 2007[6]). Argentina's improved access to the Brazilian market after the establishment of MERCOSUR motivated Argentinian firms to invest more in R&D (Bustos, 2011[7]). Empirical evidence also suggests that increased import competition improves aggregate productivity (Eslava et al., 2013[8]) and, on balance, leads to more innovation in both developed and developing countries (Shu and Steinwender, 2019[9]).

The second approach to evaluating the economic impact of trade liberalization uses structural economic models to simulate the overall welfare changes that result from more efficient allocation of resources and cheaper access to intermediate inputs. One such simulation suggests that the reduction in tariffs due to NAFTA raised the intra-bloc trade by 118% for Mexico, 11% for Canada, and 41% for the United States, which increased welfare in Mexico and the United States by 1.31% and 0.08%, respectively, and reduced welfare in Canada by 0.06% (Caliendo and Parro, 2015[10]).

Finally, an influential econometric study has used a natural experiment to estimate that one per cent increase in international trade leads to roughly half a per cent increase in income per capita (Feyrer, 2019[11]). This estimate likely captures all the channels through which trade affects income per capita as well as broader channels related to deeper economic integration. Other studies combine this result with estimated trade effects of a particular agreement to arrive at an estimate of welfare effects of trade policy. For instance, (Dhingra et al., 2017[12]) use the estimated trade impact of joining the European Union to suggest that Brexit will lead to a decline in the United Kingdom's income per capita between 6.3% and 9.4%.

Methodological approaches to *ex ante* assessments of economic impacts of FTAs have been widely discussed in the literature (Piermartini and Teh, 2005[13]; Kirkpatrick and George, 2006[14]; Kehoe, Pujolas and Rossbach, 2017[15]). In Section 3, we build on this literature and focus only on those approaches that serve as a basis for the assessment of environmental, social and human rights impacts.

2.2. The environmental dimension

Background

By creating opportunities for more efficient allocation of resources and increased technology diffusion, trade liberalization can help reduce the environmental pressure of production and improve environmental outcomes. Specific environmental commitments in trade agreements can also have positive impact if they lead to improvements in domestic environmental regulation. On the other hand, increased transportation associated with international trade may offset some of the potential positive effects. Moreover, when the stringency of environmental regulation varies across trading partners, international mobility of industry may have negative global impacts. At the national level, environmental impacts also depend on the sectors and products in which imports and exports change, thus depending on the comparative advantage of each trading partner.

Over the past three decades, a body of work has emerged on developing and implementing various frameworks for assessing the environmental impacts of trade and trade policies *ex ante* and *ex post*. One of the earliest efforts was undertaken in the early 1990s by the European Commission (EC) when it conducted a broad assessment of the environmental impacts of the Single Market. In 1992 and 1993, the governments of Canada and the United States both conducted environmental reviews of the then proposed NAFTA and the Uruguay Round Agreements. The NAFTA negotiations elicited a more general interest about the impact of economic development and trade on the environment (Grossman and Krueger, 1991[16]).

The first set of proposed methodologies for conducting *ex ante* environmental reviews of trade agreements was elaborated by the OECD Joint Working Party on Trade and Environment (JWPTE) (OECD, 1994[17]),[5] following the OECD Ministerial Council 1993 Procedural Guidelines on Trade and Environment, which recommended that "*Governments should examine or review trade and environmental policies and*

[5] The report also proposed methodologies for conducting trade reviews of environmental policies and agreements.

agreements with potentially significant effects on the other policy area early in their development to assess the implications for the other policy area and to identify alternative policy options for addressing concerns".

NAFTA's side agreement on Environmental Cooperation established a Commission for Environmental Cooperation (CEC) to consider on an ongoing basis the environmental effects of NAFTA. An Analytical Framework was developed for that purpose (CEC, 1999[18]). Simultaneously, the United States and Canada developed their own systematic approaches to assessing the environmental impacts of trade so as to help identify potential positive and negative environmental effects of trade agreements and to facilitate policy responses throughout their negotiations and implementation.[6] In the United States, environmental reviews (14 to date[7]) are undertaken by USTR officials in consultation with relevant agencies and stakeholders. In Canada, the process to assess the domestic environmental implications of the WTO Doha Round was subsequently broadened to apply to bilateral and regional negotiations. Canada's environmental assessments (EA – over 20 to date[8]) are conducted by government officials responsible for international trade, in consultation with relevant government departments, requiring both inter-departmental coordination and external consultations with stakeholders.

The European Union launched its first trade and sustainability assessment in 1999 in anticipation of the Doha Round (Kirkpatrick and Lee, 1999[19]). Since then, such assessments have been enshrined in the EU's broader commitment to sustainable development, and SIAs are now required for all major trade-related initiatives, including multilateral, bilateral and regional negotiations, so as to identify their potential economic, social and environmental impacts both in the European Union and in the countries or regions with which the European Union is conducting negotiations. The European Union has conducted 34 SIAs since 1999, of which five are ongoing.[9]

UNEP started assessing environmental impacts of trade projects in 1997, moving to a broader approach in 2001. This Integrated Assessment of Trade Policies (IATRP) is an interdisciplinary process to evaluate the system-wide, cause–effect chains associated with trade, to encourage better and more informed decision-making. An IATRP is meant to explore the linkages between trade, environment and development, seeking in parallel to build capacity in developing countries and economies in transition to conduct integrated assessments of trade liberalisation and trade measures.[10] Since 1997, UNEP has facilitated over 30 assessments (UNEP, 2001[20]) (Kessler and Abaza, 2006[21]).

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[6] In the United States, Executive Order 13141 of 1999, and Guidelines for Implementation of Executive Order 13141 (2000) established the process for the environmental review (ER) of trade agreements. The policy of conducting reviews was reaffirmed in 2001, and the Trade Act of 2002 requires reviews consistent with the 1999 Executive Order and guidelines with reports to Congress.

In Canada, the process is guided by a Framework for Conducting Environmental Assessments of Trade Negotiations, launched in 2001, revised in 2020 (GOC, 2020[97]), supplemented by a Handbook for Conducting Environmental Assessments of Trade Negotiations (GOC, 2008[108]).

[7] https://ustr.gov/issue-areas/environment/environmental-reviews.

[8] https://www.international.gc.ca/trade-agreements-accords-commerciaux/env/EAlist-listeEE.aspx?lang=eng Nine of these remain interim as no final environmental assessment is conducted when no significant environmental impacts are identified during the early phase.

[9] https://ec.europa.eu/trade/policy/policy-making/analysis/policy-evaluation/sustainability-impact-assessments/

[10] *Reference Manual for the Integrated Assessment of Trade-Related Policies* (UNEP, 2001[20]) and its subsequent *Handbook on Integrated Assessment of Trade-related Measures: The Agriculture Sector* (UNEP, 2005[85]).

Assessment framework

The pioneering approach of the OECD JWPTE laid the groundwork for the systematic environmental assessment of trade, influencing other international organisations, governments, and NGOs to develop their own approaches. Among other things, it highlighted five different types of trade-related environmental effects stemming from trade measures or agreements: scale effects, structural effects, technology effects, product effects, and regulatory effects. This typology remains relevant and has been employed with varying degrees of emphasis in all approaches developed to assess the environmental impacts of trade.[11] Generally,

- The scale effect predicts that the economic expansion resulting from trade liberalisation will increase pollution and the depletion of natural resources, all other things held constant.
- Structural effects are associated with changes in the patterns of economic activity or the micro-economic effects. Positive structural effects may result when trade measures and agreements promote an efficient allocation of resources and efficient patterns of production and consumption. Negative structural effects may occur when appropriate environmental policies do not accompany changes in patterns of economic activity, and when environmental costs and benefits are not reflected in the prices of traded goods.
- The technology effect can lower pollution if trade liberalization leads to the diffusion and adoption of new (less resource intensive or less polluting) technologies (Garsous and Worack, 2021[22]). Moreover, the increase in real income caused by trade liberalization may lead consumers to demand more environmental quality, leading to more stringent policy and adoption of cleaner technologies.[12] Empirical literature has found some support for the technology effect.[13] There is also some evidence that this effect may dominate the pollution-increasing scale effect, even though it depends on the type of pollutant.[14]
- Product effects may be direct or indirect and positive or negative. Some products may be environmentally friendly, while others may be hazardous to the environment. For example, increased trade in environmental goods and services would yield positive effects while trade in hazardous waste could yield negative effects.[15]
- Regulatory effects occur where trade reforms may have an impact on environmental regulations and standards. On the positive side, trade agreements may explicitly include measures to improve environmental standards. But particular provisions of trade reforms may also impinge on a government's ability to set environmental protection standards (OECD, 1994[17]). The existence of positive regulatory effects have found support in recent empirical literature which

[11] See, for instance, Tseigas, Gray and Hertel (2002[107]) and Cherniwchan, Copeland and Taylor (2017[24]).

[12] This follows the Environmental Kuznets Curve hypothesis which asserts that during the process of economic development countries pollute more in the early stages, but that economic growth and greater wealth means that countries in later stages of development can invest in environmental improvement.

[13] See, for instance, Cui et al. (2020[131]) for empirical evidence from Chinese firms.

[14] See, for instance, Antweiler, Copeland and Taylor (2001[28]), Cole and Elliot (2003[129]), Managi, Hibiki and Tsurumi (2009[130]) However, these empirical studies still suffer from a range of identification issues. See Cherniwchan, Copeland and Taylor (2017[24]) for a detailed exposition.

[15] Though trade in waste could also have positive environmental effects in the context of the circular economy.

shows that environmental provisions can promote domestic environmental legislation and limit pollution (Brandi et al., 2020[23]).

At the national level, environmental impacts also depend on the **composition** effect which is associated with changes in the pattern of economic activity and its direction varies across countries depending on their comparative advantage: trade liberalization may lead to a reduction in pollution if "dirty" industries shrink relative to "cleaner" industries, and vice versa. If, as a result of trade liberalization, a country imports more dirty products, its production in dirty industries may decline and with it its territorial emissions. However, the impact at the global level depends on the emission's intensity of production in the exporting country relative to the importing country.

The composition effect is related to the Pollution Haven Hypothesis, which is based on the assumption that the stringency of environmental regulation is an important determinant of comparative advantage. It holds that international trade agreements cause pollution-intensive industries to migrate to countries where environmental standards are more relaxed and may result in a so-called "race to the bottom" in terms of environmental standards. While there is empirical evidence that environmental regulation affects comparative advantage, empirical support for the Pollution Haven Hypothesis has been mixed so far (Cherniwchan, Copeland and Taylor, 2017[24]). Nevertheless, recent research points towards the potential existence and potential magnitude of carbon leakage (Misch and Wingender, 2021[25]).

Additional effects have emerged in subsequent issue- or sector-specific assessments: for example, a study examining possible mechanisms of the impacts of US trade agreements on climate change added a transportation effect (Porterfield, Gallagher and Schachter, 2017[26]). While trade liberalization can contribute to lower output emissions, some of these reductions are offset by emissions from increased international transport. Such offset is particularly strong when liberalizing trade with distant partners. Nevertheless, estimates suggest that environmental costs of carbon emissions associated with international transportation are only a fraction of the overall positive welfare effects of international trade (Shapiro, 2016[27]).

The complex interrelations between these effects are also important. Environmental assessments focus quite extensively on the relationship between the negative environmental effects from increases in the scale of economic activity and the positive changes brought by the sharing and development of 'green' technologies, climate-friendly products and best practices to mitigate any negative environmental impacts of trade (Antweiler, Copeland and Taylor, 2001[28]). For instance, the EU-Indonesia SIA found that, while an increase in production was expected to lead to a corresponding increase in GHG emissions, the agreement offered opportunities to disseminate climate-friendly products and technologies, which could lead to an overall reduction in GHG emissions. Global Affairs Canada's recent EAs note that the likelihood and significance of environmental impacts will depend on the increase in investment, the sectors, and the environmental regulatory regime in place domestically. Potential negative environmental impacts may be offset by positive impacts from procurement of efficient technologies, the use of "green procurement" and environmental stewardship (GOC, 2017[29]) (GOC, 2018[30]).

Given the constraints and complexity of working at an economy-wide level, the OECD Guidelines also suggested that case studies "*of particular types of environmental impacts or of particular economic sectors or geographical regions might be conducted*" (OECD, 1994[17]). UNEP has developed screening criteria that can help identify priority sectors for environmental impact assessments (Box 1). Sector studies and studies of horizontal issues (components of the trade agreement that affect multiple sectors such as rules of origin, intellectual property rights, investment, and government procurement), have been used extensively by academics, governments and international organizations to supplement macro economy-wide approaches with geographically limited or issue-specific studies. These studies have successfully demonstrated concrete links between the economic impacts of trade and various environmental effects,

generating increasingly specific and relevant findings and recommendations. For instance, an early SIA of the EU-ACP Economic Partnership Agreements examined how the horizontal issue of rules of origin (RoO) in the Southern Africa Development Community (SADC) could impact a number of environmental indicators such as water quality and quantity; wastewater and solid waste; coastal and marine resources; energy use; electric power consumption; and CO2 emissions. While it recommended to simplify and relax RoO to promote economic diversification and value addition through increased trade in transformed products, in particular for fisheries products and textiles and clothing, it called for development cooperation to address adverse environmental effects through infrastructure to handle waste, upgrading of fish-processing and agro-processing facilities and development of cold storage (EC, 2007[31]) (PriceWaterhouseCoopers, 2006[32]).

Box 1. UNEP screening criteria for priority sectors in environmental impact assessments of trade

UNEP's screening criteria, developed drawing on the OECD Methodologies and CEC criteria for *ex post* assessment of NAFTA's environmental effects in selected sectors (CEC, 1999[18]), and taking into account UNEP's mandate to build capacity and support sustainability extending to issues of equity and social wellbeing, consider whether the sector:

- is important to the national economy and in particular in its contribution to export revenues
- relates directly or indirectly to major environmental media and natural resources
- relates directly or indirectly to important issues of equity and social well-being
- provides a strategic natural resource (such as a certain foodstuff) that a large proportion of the population depend upon for their livelihood
- has been, or might become, the subject of changes in economic rules induced by trade-related policies
- is one with significant trade flows in both volume and financial terms and is experiencing changes in those flows, and
- is one where one might expect, *a priori*, there are important sustainability effects attributable to trade-related policies

Source: UNEP (2001[20]).

Indicators

The OECD has been a pioneer in the field of environmental indicators. In 2008, it issued a set of key environmental indicators covering a range of pollution, natural resources and assets-related issues for which data was available for a majority of OECD countries (OECD, 2008[33]).[16] The OECD has also

[16] Including: Climate change (CO_2 emission intensities; index of GHG emissions); Ozone layer (indices of apparent consumption of ozone depleting substances); air quality SOx and NOx emission intensities); Waste generation (municipal waste generation intensities); freshwater quality (waste water treatment connection rates); freshwater resources (intensity of use of water resources); forest resources (intensity of use of forest resources)'; fish resources (intensity of use of fish resources); energy resources (intensity of energy use); and biodiversity (threatened species). Initial medium-term indicators were also proposed, subject to further development.

developed a set of trade and environment indicators to shed light on some of the interactions and improve compatibility between trade and environment policies such as the links between strong environmental policies and regulation and trade in environmental goods and services in sectors such as renewable energy (Garsous, 2019[34]).[17]

Considering the appropriate indicators to include in an environmental assessment usually takes account of several issues, starting with national (or regional) priorities, specific challenges, and key sectors. Canada's recent EAs have employed three types of indicators: GHG emissions, fossil fuel energy use and water use (GOC, 2017[29]) (GOC, 2018[30]).[18] As the assessments focus on domestic effects, they employ national data sets from the Canadian System and Resource Accounts of Statistics Canada and the National GHG Inventory of Environment and Climate Change Canada (ECCC). The US Guidelines, on the other hand, identify the following as meriting consideration: air, climate, water, protected areas, endangered species, biodiversity, and environmental quality related to human health.[19]

The European Union encourages the use of "state-of-the-art available indicators", with no specific indicators suggested, but with nine core themes selected for individual SIAs. These themes are air and climate; land; water, oceans, seas and coast; biodiversity; energy; waste; transport; and chemicals. Additional themes can be added to address other priorities. For example, the EU-Mexico SIA included 'environmental quality' and the 'regulatory environment' along with their corresponding indicators.[20]

The wider geographical focus typically adopted by EU assessments (covering impacts on trading partners or third parties, see Section 2.6) mandates internationally recognized sources over national sources for better cross-country comparability. These include trade data available from ComExt, published by EUROSTAT, and environmental data collected in the World Bank's World Development Indicators and Industrial Pollution Projection System, Global Environment Monitoring Systems (GEM), UN databases, and issue-specific data sets such as the Emission Database for Global Atmospheric Research (EDGAR). Despite several comprehensive international data sources, there remain environmental issues for which global data sets do not exist. For instance, non-pollution indicators capable of showing changes in biodiversity, forest cover, habitats, and ecosystems are less developed and less quantitative than pollution-related ones (CEC, 2002[35]). International data sources are especially important for trade SIAs that assess extraterritorial effects on countries where national data sources have low coverage or reliability. Moreover, even where the focus is only on the domestic economy, international data sets are essential for assessing changes in the environmental footprint of domestic consumption, which may come from pollution in third countries. On the other hand, some national data sources are available at a more detailed level and thus allow analysis that is more precise.

[17] Including: carbon emissions embodied in trade, raw materials embodied in trade, trade in environmentally-related goods; support to fossil fuels and renewable energy; trade in waste and scrap; nutrient balances of exported grains; and enabling policy and regulatory environment for renewable energy.

[18] The three indicators complemented the GTAP-based approach and were analysed based on scale, composition and technology effects (with the exception of water use, for which a technology effect was not available). Yet Canada has recognized that modelling based on only three indicators does not capture the full breadth of environmental issues that might be affected by a trade agreement as comprehensive as CETA.

[19] Guidelines, App. C (IV)(G)(1)(3). Climate effects have not yet been addressed in US reviews (Porterfield, Gallagher and Schachter, 2017[26]).

[20] The indicators covered energy intensity by sector; resource use and efficiency; CO_2 emissions; land use intensity; GHG emissions (CH_4 and N_2O); level of deforestation; waste intensity/production; level of protection of threatened species; use of fertilizers and pesticides in agriculture; ecosystems and biodiversity; and compliance with MEAs (LSE, 2020[75]).

UNEP (2001[20]) has devised helpful criteria for selecting the most appropriate indicators, including the fact that i) they reflect a full range of key environmental issues; ii) they can show trends over time; iii) they are easily understood by non-specialists; iv) they are credible; v) they are available; and vi) they are measurable with an acceptable level of financial and human resources. However, UNEP's integrated approach, bringing together trade, environment and development/social indicators coupled with a strong capacity building component and a focus on the contribution of stakeholders in the process (including in the selection of indicators) has tended to give environmental issues less prominence than socio-economic ones in some instances (Blobel, Knigge and Görlach, 2005[36]).

2.3. The social dimension: Labour

The social dimension of sustainability primarily covers labour issues and their consequences for poverty and income inequality. However, inclusiveness issues, in particular gender equality and impacts on vulnerable groups, including indigenous populations, ethnic minorities and people with disabilities, have gained momentum as a separate topic of concern over recent years. These latter aspects will be described in Section 2.4.

Background

A beneficial impact of trade on income and productivity is conditional on reallocation of resources to the most productive firms and activities. While increased efficiency of production may lead to overall higher employment levels, workers may need to change employers, update their skills or relocate geographically. Moreover, increased openness is also associated with knowledge spillovers and increased technology adoption, accelerating not only structural but also technological change. As a result, trade liberalization requires an adjustment on the labour market that may lead to an uneven employment and wage impact on different groups of workers depending on their sector of employment, occupation, skill levels, age or even geographical location.[21] Domestic labour market institutions, social and education policies determine how costly the adjustment is for workers and the economy as a whole.

Labour-related issues were only gradually included in European Union's trade SIAs: while SIAs for the EU's trade agreements from the period 2000-2009 covered on average around half of possible labour issues, SIAs from the last decade (2010-2018) now cover the vast majority (Rojas-Romagosa, 2021[37]). The list of issues covered in the EU SIAs includes, among others, wage inequality; labour rights at work; forced and child labour; the right to equal opportunity at work; the right to unionise; the right to work; the right to a minimum wage; and migrant worker protection. The geographical scope of the analysis typically covers both the European Union and the partner countries.

The Government of Canada also introduced a detailed *ex ante* labour market impact assessment in 2018, in the context of its Gender-based Analysis Plus (GBA+) process aimed at identifying the potential impacts and opportunities to address gender and inclusivity considerations. Accordingly, labour market outcomes are analysed for diverse groups of people defined by their socio-economic status, geography, skill levels, occupation, age and gender, among others. Concerning the labour market impact, US trade sustainability assessments have to include the impact on aggregate and sectoral employment. Both Canada and the United States focus on labour impacts within their national territory.

[21] See, for instance, Autor, Dorn and Hanson (2016[63]) for an exposition of channels through which the import competition from China affected the US labour market, Helpman (2016[112]) for an overview of the links between globalization and inequality, and Goldberg and Pavcnik (2007[109]) for a review with a focus on developing countries.

Assessment framework

Theoretical frameworks for analysing the impact on labour market outcomes of workers with different skill levels are well established. In the Heckscher-Ohlin framework trade liberalisation leads each economy to specialize in their comparative advantage sectors so that a low-income economy specializes in sectors that predominantly employ low-skill workers while a high-income economy specializes in sectors where high-skill workers dominate. Such reallocation puts downward pressure on wages of low-skilled workers in high-income economies, increasing the skill wage premium and thus wage inequality. The opposite is predicted in the low-income economy.

Resource reallocation does not happen only between sectors but also within sectors between different types of firms. The Melitz theory predicts that upon trade liberalization, low-productivity firms shrink while high-productivity firms expand in all sectors. More productive firms typically employ more skilled workers and therefore this channel predicts that trade liberalization puts upward pressure on wage inequality everywhere. Moreover, trade liberalization may also foster technology diffusion and motivate the expanding firms to upgrade their technology. Since technology typically substitutes for low-skilled workers this channel may further reinforce the increase in the relative demand for skills in high-income economies and counter the Heckscher-Ohlin channel in low-income economies.[22] The latter helps explain why many studies have found a positive relationship between trade liberalization and skill-related wage inequality not only in high-income countries but also in developing economies (Bacchetta et al., 2017[38]). Even though *ex post* empirical studies suggest that wage inequality is predominantly driven by differences across firms (Helpman et al., 2017[39]), because of the difficulties in examining firm level information, the first, inter-sectoral channel, gets most attention in trade SIAs.

Most methodologies used in SIAs, assume that workers can change jobs easily. In reality, labour mobility frictions may be substantial. There may be mismatches between skills demanded by expanding exporting firms and the skills of workers that are laid off by contracting import-competing firms. Geographical mobility of workers is also limited and therefore the location of contracting and expanding firms matters. If an industry is geographically concentrated, the impact on its workers may have strong indirect effects on the whole area – increasing employment and wages in areas where expanding sectors are located while reducing employment and wages in areas where contracting sectors are located, leading to uneven labour market impacts across regions within countries.[23] The existence of labour mobility frictions also implies that trade liberalization may affect the level of frictional unemployment.

In the case of the labour impact of trade in developing countries, an added layer of complexity is due to the usually large share of informal workers in the economy. These informal workers do not have social and health insurance and are usually underemployed and do not have access to training. This not only limits their capacity to change to jobs in new activities and/or with new tasks, but also increases their monetary adjustment costs. At the same time, the informal sector may serve as a buffer for trade-displaced workers, and in the absence of informality, the effects of foreign competition on unemployment might be more severe (Dix-Carneiro et al., 2021[40]).

Labour market institutions, education and training policies as well as the general degree of social protection mediate the labour market impact of trade policy. They influence the size of labour mobility costs and the extent to which these costs are born by workers. The inclusiveness aspect of international trade has received increased attention in the past decade, recognizing that policy coherence and targeted support

[22] See Aleman-Castilla (2020[113]) for a recent review of theoretical frameworks for assessing the impact of trade on labour market outcomes.

[23] See, for instance, Topalova (2010[110]) or Autor, Dorn and Hanson (2013[111]) for an *ex post* analysis of an import shock through the lens of geographically segmented labour markets.

policies may be needed to maintain public support for openness (Jansen, Peters and Salazar-Xirinachs, 2011[41]; OECD, 2017[1]; IMF, World Bank and WTO, 2018[42]).

Indicators

The most common labour market indicators used in trade SIAs are nominal and real wages and employment statistics, both at the aggregate level and disaggregated by workers' educational attainment, sector of employment and, depending on assessment criteria and data availability, by other worker characteristics such as occupation, gender or age. Some assessments also explicitly consider labour force participation and unemployment rate statistics.

For the quality of employment in terms of working conditions, analysis typically relies on qualitative assessments. The ILO proposes a list of indicators that can be used to assess several aspects of job quality, such as working time, stability and security or safe work environment (ILO, 2013[43]). The level of trade union membership combined with wage statistics has been used to assess potential impacts of related labour market clauses.

2.4. The social dimension: Gender and inclusiveness

Background

Increasing awareness of the need to address distributional impacts of trade policies has brought inclusiveness issues on the agenda of trade negotiators, in particular as regards gender impacts (Korinek, Moise and Tange, 2021[44]). Two models currently applied are Canada's GBA+ and the EU's trade-related gender analysis undertaken in the framework of its SIAs. A number of other *ex ante* impact assessments may consider differentiated labour market impacts on women, minority ethnic groups or people with disabilities.[24] Impacts on minorities and vulnerable rural populations may also be covered in the context of prior environmental impact assessments of trade agreements, for instance when discussing land use or deforestation. More recently, the OECD has developed a Gender Impact Assessment Framework (Korinek, Moise and Tange, 2021[44]).

Devised as an impact analysis to be applied to all federal sectors and domains, not just to trade policy, Canada's GBA+ seeks to explore FTA impacts through a comprehensive quantitative and qualitative chapter-by-chapter analysis. By contrast, the European Union's SIAs were specifically developed to analyse potential impacts of ongoing trade negotiations. Despite this different point of departure, both mechanisms have had to contend with scepticism about the relevance of gender considerations within trade policy; but also the scarcity of gender disaggregated data and the difficulty of interpreting them in a trade policy context.

GBA+ is defined as "an analytical process that policy makers use to examine the potential impacts (both intended and unintended) and opportunities of a policy, plan, program or other initiative on diverse groups of people, taking into account gender and other identity factors. The plus (+) indicates that gender-based analysis goes beyond considerations of sex and gender to include a range of intersectional identity characteristics …" (GOC, n.d.[45]). In 2018 the Government of Canada announced that GBA+ would be rolled out to apply to more FTAs in future. At the time of writing, the Government of Canada web-pages relating to international trade and investment report the completion of GBA+ processes for Canada-Mercosur FTA negotiations, as well as of the Canada-United States-Mexico Agreement.

[24] For instance, UK Department for International Trade (2020[133]).

In the EU context, the European Parliament's in-depth analysis of EU trade policy in relation to gender underscored that trade affects women differently than men both in terms of employment opportunities and as receivers of public services (European Parliament, 2015[46]) and invited a stronger focus on gender equality. The EU SIA Handbook stresses that "particular attention should also be paid to women's rights and the effect that the agreement under negotiation could have on gender equality" and suggests referring to the EU Manual for Gender Mainstreaming (European Commission, n.d.[47]) for guidance. While not containing a separate chapter on gender, the SIA on the MERCOSUR agreement (LSE, 2020[48]) addressed gender issues several times, including in the section on rural livelihoods (where it highlights the potential negative impact on small scale women farmers); and the manufacturing sector (where the "overall gender impact is expected to be relatively neutral", with the possible exception of particular industries where female employment is concentrated, such as the textile sector).

To assist members wishing to undertake trade and gender country reviews so as to support the development of trade-related policies and regulations or negotiation of trade agreements, the OECD established an analytical framework for assessing and improving the gender responsiveness of trade policies (Korinek, Moise and Tange, 2021[44]). This framework enables the mapping of how women are impacted by trade and trade policies as consumers, workers and traders/entrepreneurs, so as to inform consideration of priority areas for market access; help estimate likely impacts on women and men in terms of job losses and gains; and point to where further action will be necessary in terms of domestic policies to support a fuller realisation of the opportunities afforded through trade agreements or to manage adjustment costs.

Assessment framework

The quantitative components of gender and inclusiveness impact assessments typically examine the social composition, including gender composition, of the sectors particularly affected by the FTA and whether there would be important differential social and gender effects that need to be managed. For instance, measuring impacts of different negotiating scenarios on women's and men's employment can inform trade negotiators about who will be most affected by market access commitments. Beyond gender, the exploration of impacts on other vulnerable groups, including indigenous populations, is at an early stage and mainly framed in a human rights perspective (Section 2.5).

While differential employment effects are often found to be limited, as women's employment is concentrated in sectors less directly connected to trade, notably in public services (Rueda-Cantuche et al., 2019[49]), available evidence illustrates that trade liberalisation and international competition will not automatically generate increased employment opportunities and improved wages and labour conditions for women. Positive labour effects are highly dependent on the sectors that expand or contract in each partner country, while gender effects of greater trade integration vary greatly depending on the stage of development and related socioeconomic institutions of the countries involved (Fontana, 2016[50]). Women-led businesses generally reap the benefits of international trade less than those owned by men, mostly because they are smaller, less well financed and benefit less from professional business networks; thus pointing to the need for domestic policies, rather than trade policy responses (Korinek, Moise and Tange, 2021[44]).

However, the assessment of gender and inclusiveness impacts can also support the identification and pursuit of trade reforms that have the potential to particularly benefit women and vulnerable groups (such as specific trade facilitation measures, or measures to support SMEs or digital trade). The EU SIA Handbook (European Union, 2016[51]) requests that consultants pay particular attention to "pre-existing conditions of stress or vulnerability … including in relation to particular vulnerable groups … [and also] … to women's rights and the effect that the agreement under negotiation could have on gender equality." In addition to the assessment's qualitative considerations of possible regulatory frameworks, SIAs explore

the possibility and impacts of specific carve-outs, meant to ensure that domestic policies to support women, people with disabilities or other vulnerable groups (including positive discrimination measures in favour of these groups, namely in the areas of government procurement and services) are sheltered from possible disputes under the future agreement.

Trade liberalization may also affect poverty levels and income inequality between different socio-economic groups in the economy. The poverty and inequality effects are a combination of:

- the effect on households as producers (workers, entrepreneurs, and business owners)
- the effect on prices of consumer goods and services
- the impact on government's social expenditure.

For instance, low-income households in many countries (though less in OECD countries[25]) tend to be low-skilled, employed in the informal sector, dependent on government support and their consumption basket is typically dominated by staple foods, often more heavily taxed at the border and more difficult to substitute in household consumption baskets (Korinek, Moise and Tange, 2021[44]). These characteristics are thus important in assessing inclusiveness impacts.

Gender and inclusiveness considerations generally flow from wider labour market, economic, environmental or human rights dimensions. For instance, an *economic effect* such as increased competition from foreign producers, may result in increased unemployment within a community, which may, in turn, most adversely affect women. Or a boost to the logging sector might produce an *environmental* effect of deforestation, which then could result in the displacement of indigenous communities. For this reason, the review of methodologies applied to SIAs in section 3 will consider aspects of the gender and inclusiveness dimensions under the social and human rights dimensions, as appropriate.

Indicators

Indicators to assess the impacts of trade agreements on gender and inclusiveness will often overlap with indicators used under the labour dimension (see above) and the human rights dimension (Section 2.5 and, in particular, Table 3). They include employment, workforce participation, unemployment, informal employment (especially in the case of developing countries) and real wages, disaggregated by workers' characteristics, such as gender, age or educational attainment if available. Additional indicators of relevance include other job characteristics, such as job security and involuntary part-time work, statistics on unpaid work undertaken by women, consumption patterns of vulnerable groups (Korinek, Moise and Tange, 2021[44]) or participation of women or indigenous populations in the concerned countries' intellectual property system.[26]To measure inequality, studies typically focus on household income inequality, the wage gap between workers with different levels of education and the gender wage gap. Other indicators include the share of people living below the poverty level or at risk of poverty, public expenditure, healthcare cost, the level of compliance with ILO conventions. For many countries, this kind of data disaggregation is limited, so that improving the collection and availability of disaggregated data is the first step required for a meaningful assessment of gender and inclusiveness impacts (Korinek, Moise and Tange, 2021[44]). Poor

[25] In OECD countries, lower and upper quintiles spend a similar share of their expenditure on similar types of goods and services, but lower quintiles spend more than upper quintiles, and save less, thereby are more impacted by prices (Luu et al., 2020[80])

[26] The GBA+ for the Canada-Mercosur FTA highlighted the existence of an important gap in the participation of under-represented groups (including women and indigenous populations) in the IP system, while recognizing that such a gap was attributable to multiple factors mainly falling beyond the scope of a trade agreement.

availability of disaggregated data will often be among the main obstacles for assessing gender and inclusiveness impacts on a developing country trading partner; however addressing data problems in that case is more onerous and politically sensitive than at home.

The GBA+ conducted on the Canada-Mercosur FTA negotiations estimated GDP, trade, and job and wage gains, income inequality, gendered impacts (concluding that the sectors projected to add more jobs – services, including retail/wholesale trade – would generate larger demands for women workers than for men), labour force participation, youth and SMEs. The chapter-by-chapter analysis found that the goods chapters could result in positive effects on women, with opportunities to seek further gender responsiveness provided the negotiating partners are willing. It also found that the services, investment and government procurement chapters could be further strengthened to maximize positive effects on women and that the environment, labour, gender, SME and indigenous people chapters had the potential to result in improved participation and benefits for women. Finally, the institutional and dispute settlement chapters also presented opportunities for enhancing gender responsiveness.

2.5. The human rights dimension

Background

The practice of assessing trade proposals for their human rights impacts is not presently widespread or particularly systematic, although isolated examples of attempts to integrate human rights-related assessments into processes for vetting and scrutinising trade proposals and arrangements, some of which are mentioned below, do exist. The most significant example to date is the in-depth analysis of potential human rights impacts as part of European Union's broader SIAs.

The drivers for this development stems primarily from the European Union's own legal and constitutional arrangements. Requirements under EU law to respect human rights in other countries have shaped the EU approach (Zerk, 2019[52]), as has the EU "Better Regulation" agenda.[27] Since the adoption of the 2012 EU Strategic Framework and Action Plan on Human Rights and Democracy,[28] all impact assessments carried out by the Commission, including sustainability impact assessments of trade agreements, are explicitly required to address human rights issues, (Council of the European Union, 2012[53]). However, some external social and political factors – notably the rise in activism by civil society organisations and other campaigners in the wake of the 1999 WTO Ministerial in Seattle have also played a part in encouraging the Commission to do more to recognise and respond to expressed concerns about potential human rights-related consequences of trade (Zerk, 2019[52]). Initially treated as a subset of "social issues" within the SIA framework, the human rights components of EU SIAs gradually achieved greater prominence and are now a discrete "sustainability pillar" of the SIA process with its own methodology. In 2015 the Commission published further guidance on integrating a human rights impact assessment into the broader SIA framework (European Commission, 2015[54]).

Outside the European Union, political support for *ex ante* human rights impact assessment (HRIA) of trade agreements is patchy. Despite a series of initiatives by different UN agencies aimed at encouraging governments to implement and invest in these kinds of processes, most of the *ex ante* HRIAs of trade agreements completed thus far (and not involving the European Union as an actual or prospective trading partner) have been initiated and conducted by non-State actors, such as civil society organisations, as well

[27] https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how_en

[28] https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/EN/foraff/131181.pdf

as national human rights institutions, academic institutions and also, though to a limited extent, UN agencies themselves (Zerk, 2019[52]). However, there are signs of growing interest in the practice at domestic level, particularly among national human rights institutions.[29] Scattered references to HRIAs of various aspects of trade policy are now beginning to appear in governments' National Action Plans on Business and Human Rights.[30] In December 2020, the UK House of Lords sought to amend legislation on post-Brexit trading arrangements (unsuccessfully as it later transpired) to require HRIAs of proposed new trading arrangements to ensure compliance with the United Kingdom's international human rights obligations.

Whether these are isolated initiatives, or can be said to mark the beginnings of a change in the extent to which (and the manner in which) human rights aspects of trade agreements are to be scrutinised in future, it is too early to say. While the reasons for non-adoption of these processes beyond the European Union will vary across countries, it is possible that continuing scepticism about their practicality and policy usefulness may be a factor, as well as concerns about the resources needed for credible and impactful processes, and other practical and methodological challenges (considered further in Section 4).

Assessment framework

Contentions about potential human rights-related consequences of trade and trade agreements expressed by various actors involved in the elaboration of trade agreements, the scrutiny thereof, or in wider reflections about their scope and significance, were brought together in the seminal work by Walker (2009[55]), who also established the generic methodological framework for assessing them. Each of these contentions, relating to the terms of individual trade agreements, their implementation, as well as broader legal and structural issues, is contested to some degree. Several questions can be raised about the relevance and accuracy of these claims, including at the level of definition or principle : for instance, there is little evidence about a true "conflict" of values or objectives between trade liberalisation and human rights, but a fair distribution of expected benefits or adjustment to expected losses may call for balancing mechanisms at the domestic or international level (OECD, 2017[1])). The grounds of causation can also be questioned, as it is a mischaracterisation to attribute potential positive or adverse impacts to a trade agreement when there may be a whole array of other factors, including migration, technology, the digital transformation or the political priorities of the partner countries that may be at the root of human rights violations. The difficulties establishing a causal connection between trade agreements and these kinds of positive or negative effects is discussed in Section 4.

Some of these contentions about possible human rights impacts argue that trade agreements can have a positive impact, including by: (1) complementing human rights law through the promotion of principles of fairness and respect for rule of law, effective and transparent regulatory and judicial procedure, and shared understanding of critical global issues as a result of cross-border economic interactions; and (2) contributing fiscal revenue resources for the progressive realisation of human rights (investment in public services needed to improve education, health, social security, etc.) through economic growth and employment. The increasing incorporation of social, labour, gender and human rights considerations in recent FTAs has contributed to putting these issues more centrally on the policy agenda of many countries; however, the extent to which increased fiscal resources would lead to greater investment in public services is a domestic and not a trade policy issue.

[29] See, for instance, New Zealand Human Rights Commission, Submission – Trade For All, 14 October 2018, at https://www.hrc.co.nz/files/8915/4042/8147/HRC_Submission_-_Trade_For_All_Agenda.pdf.

[30] For a useful compilation of governmental statements on human rights impact assessments in National Action Plans, see Danish Institute for Human Rights (2020[128]).

Other contentions claim that trade agreements can have a negative impact on human rights, including by (3) breaching human rights in practice through long term job losses, business bankruptcies, food insecurity or significantly raised costs of essential medicines; (4) leading to a "race to the bottom" by encouraging offshoring to countries with lower labour standards and increasing pressure to lower labour costs and harmonise labour standards downwards; or more generally (5) adhering to a different, and possibly conflicting, "efficiency" model of development, oriented towards economic growth, aggregated welfare and efficient production that would threaten the promotion of individual wellbeing, welfare and dignity, with the State as primary guarantor. Yet, many of these effects are contingent on multiple factors and cannot be directly and exclusively attributed to – or indeed be addressed – via trade policy.

Some contentions claim that trade agreements can limit government and stakeholders' capacity to actively promote human rights by (6) restricting governments' policy space to take action in favour of human rights, or to reverse liberalisation measures with adverse impacts, or by reducing public resources available for investment in essential public services; (7) limiting the use of trade as a human rights enforcement tool by restricting the ability to impose trade-related sanctions for human rights abuses; or (8) not sufficiently ensuring stakeholders' say on matters that affect them.

Finally, some contend that potential normative conflicts between trade commitments and human rights generally result in prioritising compliance with the former due to (9) the tendency to express human rights obligations, such as access to medicines, access to health services or distribution of food, in more aspirational terms; and (10) the comparatively stronger enforcement mechanisms of trade commitments and the lack of clarity as to the flexibilities under trade agreements for promoting human rights goals.

Of the latter two categories of concerns, some hinge on the leeway allowed by trade agreements in reacting to human rights considerations (including countries' "right to regulate"), but others seem to expect of trade policy issues and action that rather belong in other policy realms.

Walker's framework has since become an influential reference point for human rights assessment practitioners, UN agencies, national human rights institutions and other advocates (e.g. civil society organisations), as well as policy makers and governmental officials including the European Commission.

Recognising that human rights impacts will vary considerably depending on the trade-related measure under contemplation – as well as the many legal, political, structural, economic and cultural factors in play – the EU SIAs Handbook provides practitioners considerable latitude to devise and implement a HRIA methodology that they consider best meets the demands of the specific assignment. The Handbook requires, at a minimum, that all assessments use internationally recognised human rights as a basic normative framework.[31] In order to identify "focus" issues, the European Commission (2015[54]) also recommends taking into account whether the predicted impacts are direct or indirect and major or minor; as well as the extent to which the affected rights are "absolute" (i.e. rights "which cannot be limited or restricted under any circumstances")[32] and "the relevance of the issue for specific stakeholders".

[31] A list of "key" human rights instruments is set out in Annex 1 to the 2015 EU HRIA Guidelines (European Commission, 2015[54]).

[32] Although the Guidance provides no clear explanation as to how "absolute" rights are to be distinguished from "other" rights (which, by implication, may be "limited" or "restricted" in some circumstances), the distinction may reflect a differentiation between human rights that are "pre-emptory norms" of international law, such as the prohibitions against genocide or torture, which may be enforced regardless of whether a State has explicitly accepted a rule (e.g. as a result of signing a treaty), and certain rights (particularly economic, social and cultural rights) which are often expressed as being subject to "progressive realisation". Even so, many human rights lawyers would take issue with the idea that human rights can indeed be divided and categorised in this way, pointing to the "universality", "inalienability" and "indivisibility" of human rights as fundamental principles of international human rights law.

All underlying concerns highlighted above cannot necessarily be addressed by *ex ante* HRIAs of trade agreements to the same extent and different types of impacts are likely to require different types of assessment methodologies. The choice of methodologies needs therefore to be informed by a clear vision of the purpose of the assessment: whether to ascertain the risk of direct breaches of human rights obligations (i.e. a "legal compliance" tool); or to assess the impacts on the levels of enjoyment of human rights (i.e. a "policy" tool). Each approach presents advantages and disadvantages in terms of achieving a "human rights respecting" approach (Table 1).

A further structural challenge arises from the fact that many of the issues expected to be covered in the "social" part of the analysis – impacts on fundamental labour rights, for example – are issues that most human rights practitioners would regard as falling within the scope of "internationally recognised human rights". The distinction between "social" and "human rights" impacts is therefore to a certain extent an artificial one. The EU handbook does not entirely overlook these problems, advising SIA practitioners to "consider the multiple impacts of a measure". On the other hand, findings relating to the area of human rights law known as "fundamental labour rights" are expected to be presented in the "social" part of the analysis, and impacts on "other" human rights considered separately (European Union, 2016[51]).

Table 1. Trade-offs associated with different purposes of HRIAs

Purpose	Advantages	Disadvantages
A "legal compliance" tool	Clear objectives. Narrower, more focussed terms of reference; clearer framework derived from international legal standards. Predominantly legal analysis. Potentially lower costs.	May not be a sufficient basis for a full exploration of rights that are expressed as being subject to "progressive realisation" (especially economic, social and cultural rights). Less appropriate for integrating political, economic and structural factors. "Legal" framing may raise expectations of stakeholders to an unhelpful degree (e.g. as regards the extent to which human rights protections can be included in the agreement terms).
A "policy tool"	Great flexibility to consider a broad range of human rights impacts. Easier integration with other forms of "sustainability" analysis. Shows commitment to progressive realisation of rights (especially economic, social and cultural rights).	Difficulties showing causation; more speculative findings; potentially lower policy impact. Scope of enquiries could prove unmanageable; potential controversies over decision-making, especially regarding prioritisation of issues. Higher costs.

Source: Zerk (2021[56]).

Indicators

Indicators are used in human rights impact assessments of trade agreements both to help articulate important aspects of baseline scenarios and to lay down a series of markers from which it will be possible to monitor trends and progress, and to test the accuracy or predictions and projections. Although there are often difficulties in expressing human rights impacts quantitatively (Section 4), certain types of statistical data can provide useful "high level" markers as to the extent to which different rights are being realised in practice, or not; as well as rates of improvement (or deterioration) in levels of human rights enjoyment or protection.

Where intended as a set of tools for assessing and tracking the human rights effects of legislative and policy-based measures, human rights indicators should be capable of capturing both the human rights duties of States (i.e. as "duty bearers"), as well as levels of enjoyment of rights by "rights-holders" (Walker, 2009[55]). In response to requests from treaty bodies, the Office of the UN High Commissioner for Human Rights (OHCHR) has proposed a methodological framework for translating human rights standards into indicators, using three main "categories" of indicator, namely

- structural indicators (i.e. indicators that show the extent of the State's commitment to realising human rights, e.g. at the level of policy),
- process indicators (i.e. indicators relevant to the effort and resources put into realising human rights domestically), and
- outcome indicators (i.e. indicators relevant to the level of enjoyment of human rights, from the perspective of the rights holder).[33]

A list of commonly used indicators in human rights impact assessments of trade agreements is set out in Table 2. In the context of an EU SIA, many of these indicators are likely to be derived from, and relevant to, the "economic", "social" and (though perhaps to a lesser extent) "environmental" components of the analysis. Their potential relevance to an illustrative selection of different human rights is also shown in the table below. As can be seen, of particular value to the human rights components of the SIA analysis are indicators which are able to articulate, and show trends in, the distribution of impacts and benefits between groups and sub-groups within society, given the importance of equality and non-discrimination as a "cross-cutting" human right.

Table 2. Commonly used indicators used to identify and track impacts on selected human rights

Indicator	Right to Development	Equality& non-discrimination (gender)	Equality& non- discrimination (disability, race, ethnicity, religion, etc.)	Right to an adequate standard of living	Right to health	Right to education	Right to food	Protection rights of people at risk of vulnerability and marginalisation
Employment and wage statistics (economy-wide and/or by sector)	✓			✓				
Employment and wage statistics, disaggregated by gender		✓						
Employment and wage statistics, disaggregated on other bases (e.g. disability, age, ethnicity, region, rural versus urban, etc.)			✓	✓				✓
Government expenditure on healthcare (as % of GDP)					✓			
Levels of infant mortality (incl. disaggregated by ethnicity, region, rural versus urban, etc.)	✓				✓			✓
Birth rates and maternal age	✓	✓	✓		✓			✓
People at risk of poverty or social exclusion (as a % of population), (including disaggregated by ethnicity, region, rural versus urban, etc.)	✓	✓	✓	✓			✓	✓
Prevalence of malnutrition (including disaggregated by ethnicity, region, rural versus urban, etc.)					✓		✓	✓

[33] See Walker (2009[55]) and United Nations 'Report on Indicators for Promoting and Monitoring the Implementation of Human Rights', Seventh Inter-Committee Meeting of the Human Rights Treaty Bodies and Twentieth Meeting of the Chairpersons of the Human Rights Treaty Bodies, Geneva, June 2008, (HMI/MC/2008/3). A wealth of resources can be accessed at OHCHR, 'Human Rights Indicators' https://www.ohchr.org/EN/Issues/Indicators/Pages/HRIndicatorsIndex.aspx .

Indicator	Right to Development	Equality& non-discrimination (gender)	Equality& non- discrimination (disability, race, ethnicity, religion, etc.)	Right to an adequate standard of living	Right to health	Right to education	Right to food	Protection rights of people at risk of vulnerability and marginalisation
Causes and life expectancy (incl. disaggregated by ethnicity, region, rural versus urban, etc.)	✓	✓	✓		✓			✓
Educational attainment, disaggregated by gender	✓	✓				✓		
Educational attainment, disaggregated on other bases (e.g. ethnicity, region, rural versus urban, etc.)	✓		✓					✓
Literacy rates (incl. disaggregated by gender, ethnicity, region, rural versus urban, etc.)	✓	✓	✓			✓		✓
Levels of trade union membership (incl. disaggregated by gender, sector, etc.)		✓	✓	✓				✓
Women elected to parliament		✓						
Women serving on boards of larger and listed companies		✓						

2.6. Defining the focus of the SIA

One of the very first steps in undertaking an SIA is to define the choice of outcomes of focus. That choice depends on several factors, including the geographical scope of the SIA, the range of policy questions mandated at the beginning of the SIA process in accordance with the assessing country's circumstances and political priorities, the timing and organisation of that process, as well as the data and analytical resources constraints. These factors are briefly reviewed below.

Geographical scope

Identifying the SIA's geographical coverage – whether it will cover domestic, transboundary or global impacts – is one of the first steps in the assessment and an important factor in determining the focus of the SIA. The degree to which an assessment can, or should, cover trading partners or third parties, will depend on several criteria, including the issue (e.g. greenhouse gas emissions or gender impacts); the level of development (whether the trading partner is in a position to conduct their own assessment) and the nature of the agreement (the expected impacts and the degree of spillovers expected).

Sustainability aspects that have an extraterritorial, or even global, scope, as is the case for some environmental impacts, are covered in most practising countries' impact assessments. The consideration of transboundary and global impacts provides a more holistic approach to critical issues, such as climate change, and allows countries to identify and mitigate impacts from imports and exports affecting their commitments under multilateral environmental agreements (MEAs) such as the UNFCCC's Kyoto Protocol (Reynaud, 2013[57]). For other sustainability aspects, an SIA may focus exclusively on domestic impacts

(e.g. Canada's Gender-Based Analysis Plus -GBA+, or US's Environmental Reviews[34]), or also include impacts on the negotiating partners (e.g. EU SIAs). UNEP's approach is largely used by individual countries to undertake sectoral case studies at the national level.

Limiting geographical scope to national impacts only can attract domestic criticism for not being a complete assessment of the impacts of the agreement. In addition, a purely domestic lens fails to harness trade-related capacity building opportunities or other measures to promote sustainability in smaller, more vulnerable trading partners, or to further strengthen global sustainability cooperation by means of shared understanding for common challenges and the appropriate way to address them (American Lands Alliance et al., 2000[58]) (Salzman, 2001[59]) (Porterfield, Gallagher and Schachter, 2017[26]). The European Union's coverage of impacts on developing countries and LDCs are also meant to support its commitment to policy coherence between trade and development policies (European Union, 2016[51]). On the other hand, a wider geographical scope comes with its own challenges, both political economy- and data-related. The particular circumstances of the negotiating partners – including their relative economic weight and levels of development – and the issue at hand will influence the scope of exploration of potential impacts: sustainability aspects expected to play a minor role in the assessing country for reasons of geography or development levels may be much more significant for the negotiating partner; yet, where the assessing economy is smaller, relatively small economic effects will translate into limited sustainability impacts on the trading partner (Francois et al., 2020[60]), raising the question of relevance of extraterritorial application in those circumstances. The relevance of adopting a wide scope will be more straightforward for transboundary issues, such as environmental impacts on shared watercourses, than purely domestic issues, such as employment adjustments.

Broad geographic coverage may also raise concerns about potential interference with environmental or social priorities in the trading partners, in particular if they lack the capacity to appraise the assessment's results from their own perspective (GOC, 2001[61]). Data availability issues may also limit the range of issues that can be reliably assessed in a wider geographical setting, or increase substantially the resource implications of the assessment. For agreements negotiated by smaller economies, expected to yield more limited impacts than agreements by larger economies or trading blocks, the cost-benefit calculation of broad coverage is less clear.

In addition to the broader geographic question, the level of disaggregation within the national economy undertaking the assessment must be decided. For large, geographically diverse countries, a regional approach may be appropriate as impacts may vary widely across the territory. For smaller, less diverse economies, nation-wide treatment may be sufficient. However, the capacity to disaggregate beyond national impacts will also be affected by data availability. Yet, without such disaggregation the ultimate relevance of the findings at the national level could be affected, especially if the negotiated provisions lead to specialization and concentration of industrial activity in specific regions within the country (CEC, 1999[18]).[35] The exclusive use of aggregate national data in a country-level approach may result in net impacts that are characterised as negligible in an economy-wide analysis, missing potentially significant impacts in specific and/or isolated regions or sectors. For instance, small changes in US output for most agricultural commodities were found to lead to small changes in overall national environmental outcomes, but to important impacts in specific regions, which risked being lost in an overarching analysis (Cooper and Johansson, 2003[62]). Studies focusing on labour market effects of trade also highlight large regional disparities (see, for instance, Autor, Dorn and Hanson (2016[63]).

[34] US Executive Order 13141 and implementing Guidelines call for the inclusion of transboundary and global environmental impacts as "appropriate and prudent".

[35] Illustrated, for example, in the CEC's case study on the environmental effects of NAFTA on feedlots (CEC 1999).

Policy questions

The range of policy questions set at the beginning of the SIA process is important in setting the focus of the SIA. Policy questions are generally defined both by political or negotiating priorities and further fine-tuned by preliminary analysis to identify the most important impacts. For instance, the focus of EU SIAs is shaped both upstream through the findings of a preliminary Impact Assessment (IA)[36], prepared by Commission services in support of the proposal to engage in negotiations and the negotiating directives issued by the Council of the European Union; and throughout the SIA analytical process by the stakeholder consultation process undertaken in parallel.

The necessity to prioritise, due to the impossibility of identifying, let alone analysing, every possible impact of a trade agreement, makes the "screening" stage of an *ex ante* impact assessment critical for the robustness and credibility of the process. For smaller countries, where the resources available for undertaking an SIA are limited, it is even more critical to narrow down the assessment to potential highly impactful policy questions that can then be assessed in greater depth. Once the key sustainability issues (also referred to as "focus" or "salient" issues) have been selected, it can be difficult in practice to change course or add further areas of study at a later stage.

Early EU SIAs were based on a list of sustainability issues to be covered in the analysis,[37] but over time, screening methodologies, and the Commission's expectations as regards the structuring of the process and presentation of findings, evolved in response to practical experience and stakeholder feedback. The 2016 Handbook for Trade SIAs (European Union, 2016[51]) shifted to a more holistic risk-based analysis, providing to the independent external consultants an "intentionally broad and non-exhaustive" indicative list of relevant themes, that would then have to be screened and further specified in the context of each specific negotiation. The Commission sought to strike a balance between the need to achieve some degree of consistency and maintain quality, while preserving the ability of the consultants to respond to novel contexts and problems. This approach would also allow for the scope of the assessment to be adjusted in line with the differing circumstances of assessing countries.

Particular sectors can also be chosen for more detailed analysis based on the specific results of an initial economic analysis, as well as input from stakeholders and experts. The *ex ante* economic analysis which quantifies the potential impacts of the agreement on GDP and trade flows, already commonly undertaken by many countries, is a good basis for screening sectors of interest appropriate to the size and economic characteristics of the assessing country. Canada, the European Union and the United States have similar approaches to these initial assessments, using CGE modelling and a set of policy scenarios to identify sectors where the agreement is expected to have a substantial impact. In addition, screening criteria generally take into account the "importance of products, or sectors that may be affected by the (…) policy or agreement for the economy of the concerned country" (OECD, 1994[17]). EU SIA in-depth sector studies pay particular attention to sectors of specific relevance in the context of EU's trade with partner countries (European Union, 2016[51]) (e.g. in the context of the EU-Indonesia RTA negotiations on fisheries, energy, mining, vegetable oils and oilseeds, clothing and apparel and financial services). In an early SIA of the EU-ACP Economic Partnership Agreements, case studies (the garment sector in Lesotho and fisheries in Namibia) were selected by experts for their potential to increase value added, their applicability to more than one Southern African Development Community (SADC) country, and for the relevance of some key

[36] IAs are Commission-wide analytical tools prepared for all Commission initiatives likely to have significant and clearly identifiable impacts – in contrast to the SIAs, which are DG Trade-specific tools.

[37] The 2006 EU Handbook for Trade Sustainability Impact Assessment contained an extensive list of Sustainable Development issues, organised around themes, sub-themes and corresponding goals, targets and standards (https://www.wto.org/english/forums_e/public_forum_e/sia_handbook.pdf) .

environmental indicators. The European Union screening criteria include consideration of sectors' importance for European Union's "outermost regions"[38] and vulnerable populations. In the United States stakeholder consultations and interagency dialogue are employed to assist in the scoping process and in selecting and prioritizing issues.

Once the relevant policy questions have been selected, appropriate indicators need to be determined in order to support their assessment, track related progress over time and inform the public in an intelligible manner. However, there is no consensus on how many or which indicators to use and some suggest limiting the number of indicators for practical reasons (Blobel, Knigge and Görlach, 2005[36]). Selected indicators need to be credible in the context of an assessment and in the eyes of stakeholders, and able to represent objectively, realistically and reasonably trends that point to policy effects, based on reliable statistical data. Using a realistic number of robust, measurable core indicators will help identify key drivers of change, target policies and effectively communicate findings to decision makers and public.

Timing and organisation

Issues related to timing and the optimal moment to undertake an *ex ante* review of trade negotiations also have a role to play in the process. Trade negotiations can be drawn out, fluid and produce final positions only at a late stage. Canada aims at conducting impact assessments early enough to contribute to the negotiations and to identify anticipated adjustment policies at the domestic level. The US approach is similar, using early assessments to feed into the negotiating process, although an assessment is not a precondition for negotiations.[39] The European Union, supported already by the advance insights of their IAs, launches trade SIAs within six months of the start of negotiations to ensure that the analysis can feed into the negotiating process, recognizing that flexibility is key and successive stages of assessment may be required (European Union, 2016[51]).

How policy questions are defined may also differ depending on whether the assessment is conducted by the country's administration or outsourced. EU SIAs are undertaken by independent consultants meant to bring an impartial perspective, and guided by an inter-service steering group (ISG) to ensure relevance of the analysis in refining EU negotiating positions (Kirkpatrick and George, 2006[14]). The environmental impact assessment of the EFTA-MERCOSUR FTA on Switzerland and on the MERCOSUR states was also undertaken by an independent academic institution on behalf of the Swiss administration. On the other hand, the impact assessment required since 2015 for each trade agreement by the US has to be undertaken by the International Trade Commission (ITC), a government agency.[40] While there are no detailed guidelines about the required methodology, the assessment has to include both economy-wide and industry-specific assessments. Likewise, in Canada GBA+ analysis of FTAs under negotiation is undertaken by Global Affairs Canada, a government agency, with the support of other government departments.

Outsourced assessments may raise confidentiality and relevance issues, in particular if they occur too early: negotiating positions cannot be fully revealed while sensitive negotiations are ongoing, possibly reducing the relevance of findings, compared to an assessment process with closer links to the negotiators (Salzman, 2001[59]) (Kirkpatrick and George, 2006[14]). An overly wide scope of analysis aiming to

[38] EU regions enjoying specific measures and derogations to help them address challenges they face due to their remoteness, insularity, small size, difficult topography and climate, and economic dependence on a reduced number of products.

[39] Executive Order 13141 of 1999 on the process for the environmental review (ER) of trade agreements and implementing Guidelines IIIA3 (Section 2.2.1).

[40] According to Section 5(c) of the Bipartisan Congressional Trade Priorities and Accountability Act of 2015.

compensate by taking into account all possible scenarios may compromise the analytical depth of the SIA; while multiple scenarios analysis that manages to maintain sufficient depth would be extremely resource-intensive. Moreover, if made public, the choice and definition of scenarios would be critical, as modelling too ambitious or restrictive scenarios could influence the negotiating position of the partner country and affect public expectations of the ultimate outcome of the deal. The organisation and distribution of responsibilities for the assessment needs to strike a balance between breadth and depth, as well as relevance and impartiality.

Data and analytical resources constraints

Finally, the focus of the SIA will also be affected by data and analytical resources constraints. The availability of relevant data can have a significant impact on the feasibility of the SIA and influence the policy relevance and robustness of results. Limited data availability, in particular as regards the negotiating partner, may be supplemented by information obtained through stakeholder consultations, although the latter also have their own limitations in terms of bias, representativeness and reliability. Data availability also has a large influence on the choice of assessment methods: poor empirical data will preclude certain types of quantitative assessment and dictate the use of alternative approaches, which may in turn be less robust. Empirical assessments are often favoured by policy makers and negotiators due to their perceived impartiality. Indeed, the EU SIA Handbook stresses the importance of SIA processes, findings and recommendations that are "evidence-based", i.e. "based on the best available research, information and data presented in a transparent manner" (European Union, 2016[51]).

By its very nature, an integrated SIA process gives assessment practitioners the opportunity, for each sustainability dimension, to draw from the analysis carried out for the purposes of other dimensions – i.e. economic, social, environmental, and human rights analysis – and to consider the implications of those findings from the perspective of the aspect under scrutiny. However, challenges remain in assessing economic, trade, social, environmental and human rights interactions in a single analytical framework. The EU's SIA handbooks acknowledge that there are multiple cross-linkages between the economic, social and environmental impacts. Most SIAs nevertheless analyse each area in isolation, leaving out possible inter-relations (Rojas-Romagosa, 2021[37]). Moreover, the analysed causal direction is typically only from economic effects to sustainability outcomes, and not vice versa. For example, changes in production structure are mapped into changes in air pollution but only a few studies go a step further and quantify the impact of air pollution on public health and the associated welfare costs. The reasons for these limitations and the extent to which they can be addressed are discussed in Section 3.1.

Another limitation regarding most trade SIAs is that, even within a single issue, they do not consistently integrate macroeconomic and microeconomic modelling frameworks (Torriti and Löfstedt, 2012[64]). An aim of trade SIAs is to assess systematically the macroeconomic trade-induced effects on microeconomic variables, such as the effects on specific worker types, household income and inequality effects, worker and particular environmental issues. Most trade SIAs employ computable general equilibrium (CGE) models, which provide a strong methodological framework to analyse the economic impacts of trade agreements. Environmental issues as well as some social and labour issues have been increasingly integrated into those quantitative models, allowing an assessment within one framework (Section 3.1). However, most sustainability issues are usually not well integrated into the main economic analysis. Most EU SIAs use a simple inference and qualitative analysis that employs the country and sector-specific economic outputs from the CGE model to provide insights into the environmental, social and human rights impacts (Rojas-Romagosa, 2021[37]) The SIA handbooks (European Union, 2016[51]) refer to this indirect approach as a Causal Chain Analysis (Section 3.2).

The combination of the various methods poses further challenges, including the scarcity of information it provides on potential trade-offs: a majority of the impacts analysed with qualitative methods are evaluated

as simple positive and negative effects, generating limited useful information on their relative importance. If for example, a trade agreement is expected to have a positive (but not quantified) impact on air pollution, but also has a non-quantified negative impact on water pollution, then it is very difficult to evaluate the overall environmental impact, and thus, to properly assess the trade-offs implicit in the trade agreement. Section 4 elaborates on these challenges.

3. Sustainability dimensions to consider

At the heart of a sustainability impact assessment is the choice of tools employed to measure the trade and economic effects and their sustainability implications. With experience, these tools have become increasingly sophisticated covering an ever-growing range of issues. *Ex ante* assessments which cover complex trade agreements and a range of sustainability topics typically employ a mix of techniques, including quantitative models accompanied by complementary qualitative methods and descriptive analysis. Each of the methods has its merits and limitations which are reviewed in this chapter, typically in comparison to the workhorse quantitative technique for economic *ex ante* impact assessments – CGE models.

The choice and mix of various techniques for sustainability assessments of trade are ultimately the domain of the user, taking into account issues such as purpose, scope, context and resources. In the following paragraphs we illustrate how the choice of techniques depends on the type of channels through which the trade agreement is presumed to affect sustainability outcomes, the most common combinations of techniques used to assess a given issue and the degree to which the efforts expended in these techniques provide additional meaningful insight into the issue at hand.

Sustainability effects are primarily a consequence of the scope and strength of the trade and economic effects of the agreement (Francois et al., 2020[60]). Figure 1 shows an example of causal links through which reductions in trade costs, and the ensuing increase in international trade may affect environmental, labour and other social outcomes. A decline in trade costs changes the domestic relative prices of goods and services, leading to changes in the size and structure of the economy. Changes in the domestic output markets (in green) then change the demand for production factors (in blue) such as natural resources and labour, which in turn affect environmental and labour outcomes, respectively. Moreover, changes in domestic relative prices of goods and services may have a direct impact on inclusiveness outcomes such as poverty or real income inequality. Finally, the changes in domestic relative prices for goods and services may lead firms to upgrade their technology which may have a direct environmental impact if the new technology is also cleaner. Human rights outcomes affected by the trade and economic channel are typically those that overlap with labour and other social outcomes.

The causal links illustrated in Figure 1 are amenable to economic modelling and tend to be the main focus of SIAs. Figure 2 illustrates the most common approaches to this modelling. The first step in each impact assessment is the quantification of the expected reductions in trade barriers, both through tariffs and non-tariff barriers. While modelling changes in tariffs and tariff-rate quotas is relatively straightforward, the quantification of non-tariff measures is more involved and typically relies on ex-post estimates based on previous agreements.[41] In a second step, these estimates are used in a quantitative model to simulate changes in trade and other economic outcomes brought about by the trade agreement. Depending on the sophistication of the methods applied and the amenability of the outcomes of interest to quantitative analysis, sustainability outcomes can be assessed in the same quantitative framework. As noted in

[41] See, for instance, Section 7.5 in François et al. (2020[60]) for details on the first step.

Section 2.1, most impact assessments include a third step in which the economic outcomes are linked to the sustainability outcomes through a different quantitative, typically partial equilibrium, model or through a causal chain analysis using inference and qualitative methods (the various models and techniques are described in detail later in this section). The horizontal arrow in Figure 2 indicates that the various approaches to linking the economic and sustainability outcomes differ in the degree of complexity of economic interactions that they capture.

Figure 1. An example of causal links between changes in trade costs and sustainability outcomes

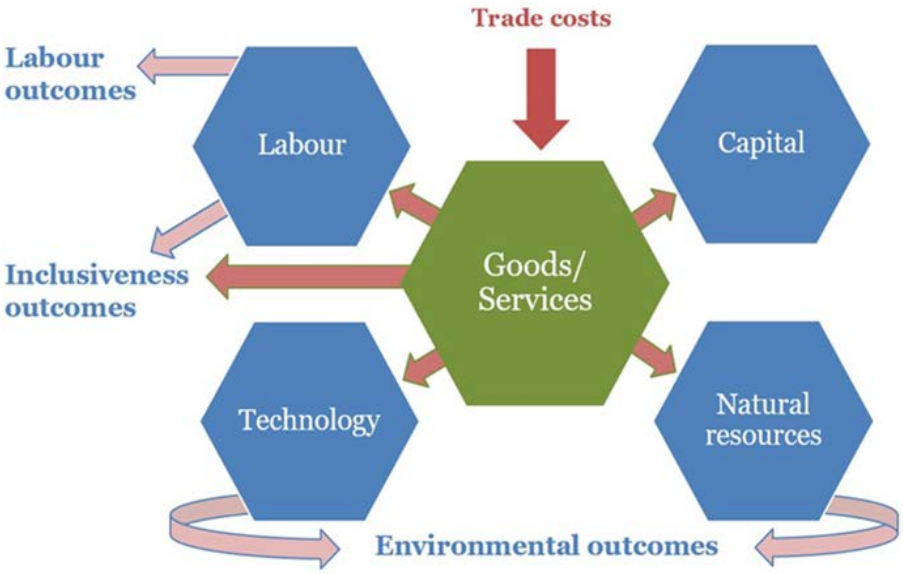
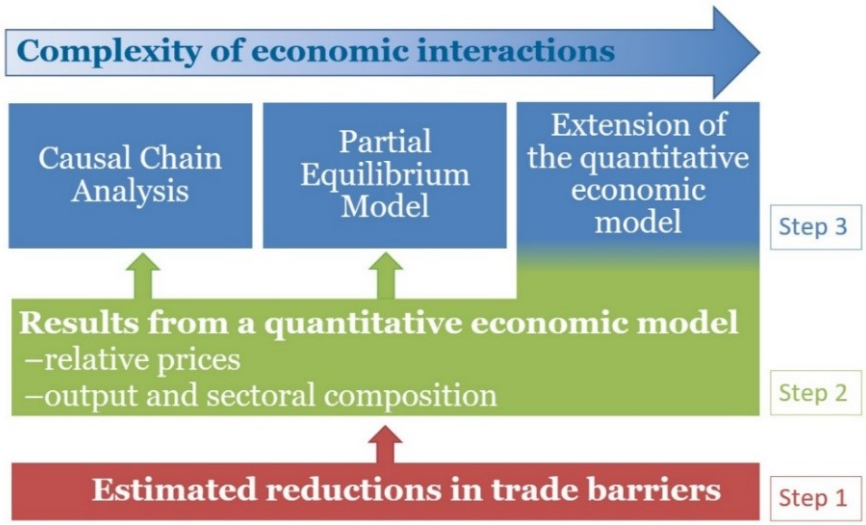


Figure 2. Approaches to assessing the sustainability impacts stemming from economic effects

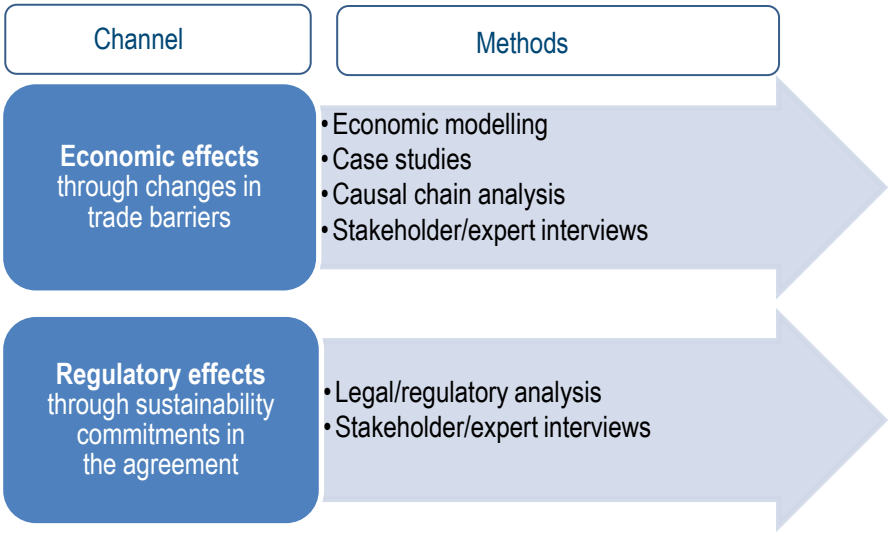


The economic effects of reductions in trade barriers are a combination of direct and indirect, so called general equilibrium, effects. The direct effects of trade costs reductions lead to the expansion or contraction of economic activities covered by the agreement. Through changes in demand for inputs and production factors, first order changes reverberate throughout the economy affecting also economic activities not covered by the agreement. Moreover, a reduction in trade costs with one trade partner can lead to, other things being constant, a relative increase in trade costs with other partners thus possibly leading to trade diversion. Consequently, through general equilibrium effects, a trade agreement may alter the economic structure of trading partners as well as multilateral trade flows. The importance of accounting for general equilibrium effects is reflected in the fact that a quantitative general equilibrium model usually serves as a basis for assessing trade and economic outcomes. A distinguishing feature of methods assessing sustainability outcomes is the extent to which they account for the indirect effects as well.

Besides lowering trade costs, modern trade agreements – an increasing number of which are now economic partnership agreements and considerably broader in scope than in the past – cover a range of topics that directly affect markets for factors of production (blue pentagons in Figure 1). For instance, provisions that address migration have a direct impact on the labour market, provisions that facilitate foreign direct investment (FDI) can affect capital markets, and clauses on intellectual property (IP) protection or technology transfer can improve access to technology and IP-intensive products. The impact of investment provisions on FDI flows is the most commonly analysed in SIAs. Similar to non-tariff trade barriers, the quantification of how much the trade agreement in question may boost FDI is not straightforward and typically relies on econometric estimates based on previous agreements. Most SIAs either stop at the FDI outcome or consider only the economic effects of changes in FDI. However, FDI flows may also have direct sustainability effects. FDI plays an important role in technology diffusion as well as in the diffusion of management and business practices (Keller, 2010[65]). For agreements between developed and developing countries, the potential for foreign owned companies to improve labour conditions and the environmental footprint of the industry where they operate can also be important. Quantitative models are not geared towards capturing these channels and therefore if SIAs include such analysis it is largely qualitative.

Some trade agreements explicitly address sustainability issues through specific commitments such as labour rights clauses or environmental clauses. These regulatory effects of trade agreements are often difficult to incorporate in *ex ante* quantitative models and qualitative (legal and regulatory) analysis is typically employed to assess their potential impacts. Figure 3 summarizes how the choice of assessment methods depends on which channel – regulatory or economic – is analysed.

Figure 3. The choice of assessment methods depends on which channel is analysed



3.1. Quantitative methods

Computable General Equilibrium (CGE) models

CGE models are the most common basis for *ex ante* impact assessments of trade agreements. These models use assumptions about how the trade agreement in question will affect trade costs to compute changes in trade, production, consumption, employment, demand for natural resources and welfare (real GDP). These changes are calculated as differences between a (counterfactual) scenario that includes the trade agreement and a (baseline) scenario without the trade agreement; as such, the CGE modelling results are not predictions, they are scenarios that evaluate the impact of a policy change keeping all other conditions constant.

Many countries have national CGE models, which tend to be more reliable when measuring domestic impacts and which may be sufficient when analysing domestic impacts in small economies. However, when examining broader or multi-country impacts, global models are usually employed. A majority of CGE approaches employ the Global Trade Analysis Project (GTAP) database (Aguiar et al., 2019[66]). The GTAP database is a global multi-regional input-output database that has extensive and comprehensive economic data for 140 countries/regions and 65 production sectors.[42] It provides disaggregated data for sectoral production, consumption, taxes and subsidies, trade, government finances, labour variables for different skill levels, and data on other production factors. Additional databases (so called satellite data available on the GTAP website) include data on emissions and more detailed use of production factors such as different types of land.

Most *ex ante* impact assessments use not only the GTAP database but also one of the GTAP models. The standard GTAP model is a multi-region, multi-sector CGE model (Corong et al., 2017[67]), with perfect competition, constant returns to scale, no frictions to labour or capital mobility and an explicit treatment of

[42] In practice, the SIAs select sectors to be analysed in detail and aggregate the rest into broader categories. The criteria for selecting sectors are (i) the current volume of trade flows, (ii) whether trade costs reductions are envisaged in that sector and (iii) whether it has characteristics that make it relevant for the chosen sustainability outcomes.

international trade and transport margins. Recent extensions to the GTAP model allow for an analysis of foreign direct investment flows and incorporate firm heterogeneity and more detailed breakdown of trade flows. The GTAP dynamic model incorporates a new treatment of investment behaviour, so that capital is perfectly internationally mobile only in the very long run, and additional accounting relations to keep track of foreign ownership of capital. This feature allows the model to capture the impact of measures that liberalize or restrict FDI flows. Bekkers and François (2018[68]) show how to incorporate firm heterogeneity in the GTAP model to capture aggregate productivity effects of within-sector changes in firm composition (least productive firms contracting or going out of business and most productive firms expanding). These firm-level dynamics may have implications for the demand for skills (more productive firms tend to be more skill-intensive) or pollution intensity of production (more productive firms tend to be more technology intensive, including environmental technologies).

CGE modelling requires assumptions about a range of parameters that govern the economic relationships modelled. Any extension to the basic framework typically also requires additional parameters. A criticism of the GTAP model is that econometric estimates of these parameters are taken from the literature and therefore may not correspond to the sectoral aggregation and years or countries covered by the database. Recent improvements on this practice include structurally estimated models which take the trade elasticities, that determine the trade volume effects of the trade cost reductions in FTAs, from econometric estimations based on data that are later used in the simulation. Given the sensitivity of results to parameter assumptions, François, Hoekman and Rojas-Romagosa (2020[69]) suggest bringing together different CGE frameworks and different parametrizations in one SIA to provide cross-checks, standardization and peer-reviewing

Strengths and limitations

There are two main advantages to the CGE modelling framework. First, it takes into account general equilibrium effects, including linkages between all markets and macroeconomic components through which a change in policy in one sector may affect all other sectors in the economy. This provides a robust framework for capturing the full range of causal links between trade policy and economic outcomes. Second, it allows the formulation of different scenarios and thus the gauging of how different assumptions about the trade impacts of the agreement change the economic outcomes of interest.

A limitation of CGE models is that they do not capture all channels through which a reduction in trade costs may impact the economy. Elements that are missing include creation of new markets (CGE models cannot estimate an impact on the extensive margin of trade – new products and/or new destinations), and endogenous knowledge spillovers or technology diffusion, to name a few. Current models also do not explicitly model household heterogeneity but rely on external linkages to other models. Differences across households in terms of their consumption and employment patterns are essential for assessing distributional effects.

Finally, these models are designed to evaluate medium- and long-term impacts and thus are not as useful to simulate short-term effects. In the short term, capital and labour mobility frictions slow down the economic adjustment. If these frictions are sizeable, the period of adjustment may be important and involve adjustment costs that are not captured in the CGE model. Therefore, many impact assessments rely on more than one model. For example, *ex ante* economic impact assessments prepared by the Centre for International Economics (CIE) for the Australian Department of Foreign Affairs and Trade use both a GTAP model and a so called “G-Cubed” model – a model originally developed by McKibbin and Wilcoxen (1992[70]) which combines CGE with a type of model used for macroeconomic forecasting and also relies on the GTAP database. CIE argues that while the GTAP model is a comparative static model and therefore provides results for a single year once the FTA has been fully implemented, the G-Cubed is a dynamic

model that traces the impacts of the FTA over the implementation period and accounts for adjustment costs in the capital stock (CIE, 2015[71]).

The data aggregation in CGE databases, such as GTAP, poses further challenges. It is sometimes necessary (depending on available data and computing power) to use regional aggregations in multi-country models, which limits the useful interpretation of data (European Commission, 2018[72]). Moreover, the relatively high product aggregation of most models does not lend itself to identifying impacts on specific products within a broader category, which is especially acute for agricultural products (European Commission, 2018[72]) (Ackerman, Gallagher and Nadal, 2001[73]) or determining environmental impacts.

Still, the European Union has noted that, "(w)hile alternatives to the CGE approach may have their merits, none has yet proven to be sufficiently reliable for an *ex ante* analysis of the economy-wide effects of trade policy change" (European Commission, 2017[74]). Quantitative models like CGE are the most sophisticated tools for such analysis. The quality of their output, however, crucially depends on choosing assumptions and parameters that correspond to both the realities of economies and the issues analysed. Consequently, they are not an off-the-shelf solution and can be a costly endeavour.

How it applies to the environmental dimension

The main indicators of environmental outcomes directly simulated by most CGE models are key GHG emissions: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), where results can be obtained directly from model estimates to the extent that the pollution relates to various sectors including the transport sector.[43] Similar analytical methods are emerging for additional environmental issues including land use, biofuels and key air pollution indicators, which can be analysed through a CGE model with new databases, such as that linking Emission Database for Global Atmospheric Research (EDGAR)-based air pollution data with the GTAP 10 Data Base.[44]

The economy-wide nature of CGE models is especially important in the analysis of GHG emissions because it accounts for both the direct effects of the agreement and the indirect effects through intermediate input demand, trade diversion and consumption changes generated through changes in wages and other household incomes.[45] What determines the carbon footprint of an activity is its own GHG emission intensity as well as the GHG emission intensity of sectors that provide intermediate inputs into this activity. If the trade agreement leads to an increase in output of an activity, it will increase GHG emissions directly through the activity's expansion. However, the ultimate impact depends also on the indirect GHG emissions content. If sources (economies) for its intermediate inputs remain the same, the indirect GHG emissions will also increase. However, if the trade agreement alters trade patterns in intermediate inputs and, for instance, leads to a trade diversion in favour of an exporter with lower GHG emission intensity, the indirect impact may be negative and dampen the direct impact.

The EU-MERCOSUR SIA produced a quantitative environmental assessment using CGE modelling, complemented by the emission intensity factors in the GTAP database and emission intensities from

[43] See, for example, GOC (2017[29]); GOC (2018[30]); LSE (2020[75]); LSE (2020[48]).

[44] See, for example, Hertel, Rose and Tol (2008[114]); Golub et al. (2010[115]); Chepeliev (2020[116]).

[45] The trade partners will be impacted by the consequences of GHG emissions irrespective of where these emissions are generated. This is why the carbon footprint of their consumption is a relevant metric for policy makers. Theoretically these linkages are important for any outcome if the policy maker cares about localised externalities in other economies (such as small particle matter, biodiversity or child labour).

EDGAR. This was combined with data from a variety of internationally recognized sources, which allowed for the more in-depth, quantitative, analysis of climate change (GHG emissions), energy use (resource use and efficiency), land use and forestry (LSE, 2020[75]). A CGE model employed in the EFTA-MERCOSUR environmental impact assessment goes further and directly simulates changes in several GHG emissions, air pollutants and natural resource use for the countries involved and for the global economy as a whole.[46]

CGE models account for the scale and composition effects as well as transportation effects, but technology effects are harder to assess quantitatively and therefore are typically analysed qualitatively. For instance a CGE model has been used to simulate changes in trade in environmental goods, which embody clean technologies, but not to quantify how this better access to clean technologies would affect environmental outcomes (Francois et al., 2020[60]). Similarly, a trade agreement may lead to increased imports of a certain type of machinery that is more energy efficient but this level of detail is not amenable to CGE modelling. For instance, the EU-Australia SIA noted the potential for commitments to promote mutually supportive trade and climate policies; facilitating the removal of obstacles to the trade and investment concerning products particularly relevant for climate mitigation or adaptation (such as renewable energy and energy efficient products and services) and generally adopting a policy framework conducive to deploying best available technologies; and strengthening cooperation on trade-related aspects of climate change policies to lock in the commitments and help ensure effective implementation of the Paris agreement, along with the right to regulate in the context of the FTA under negotiation (BKP Economic Advisors, 2019[76]). These more policy conducive elements are less well captured in empirical models.[47]

CGE models are also less helpful for assessing complex economic-environment interactions such as on water stress or biodiversity loss that are localised in space rather than following national borders. Challenges also remain regarding the range of environmental data available, and the selected regions for which data are available.

How it applies to the social dimension

The main indicators of labour outcomes directly simulated by most CGE models are changes in sectoral employment and real wages, overall and by skill levels. Many SIAs then use the employment changes in particular sectors to assess all the other labour and social issues indirectly, through a qualitative or other empirical analysis. Moreover, the detail of worker characteristics in CGE models is often constrained to dividing workers into two main categories: skilled and unskilled, and their sector of employment. All other worker characteristics, such as gender, formality, rural/urban, are not accounted for. For example, all these worker categories have distinct wage gaps, while working conditions and social protection can also vary greatly among these categories, in particular for informal or types of unskilled workers. CGE models do

[46] Benchmark GHG emissions data cover CO_2, CH_4, N_2O, and fluorinated gases. They are derived from IEA and FAO data (various releases), the methane and CO_2 accounts data from Fernández-Amador et al. (2017[121]), (2020[122]), and GTAPv10 satellite accounts data, and are reported as CO2 metric ton equivalents for non-CO_2 GHG emissions. The NGHG data cover atmospheric emissions of black and organic carbon compounds, carbon monoxide, atmospheric ammonia, non-methane volatile organic compounds (short and long cycle), nitrogen oxides, SO_2, and particulate matter 10 micrometres or less in diameter and 2.5 micrometres or less in diameter. The NGHG indicators cover important contributors to smog and acid rain, tropospheric ozone depletion, degradation of human health, and damage to sustainability of agricultural and ecosystems. They are derived from GTAP satellite accounts data (Ahmed et al., 2014[117]); (Burcu Irfanoglu and van der Mensbrugghe, 2015[118]); (Baldos, 2017[119]); (Chepeliev, 2018[120])). Resource use covers the use intensity of forest land, grazing land, agricultural land and mining intensity.

[47] While CGE models cannot properly assess these elements, there is scope for micro-economic analysis that assesses the costs and benefits of adopting certain technologies, given price differentials and regulatory constraints.

not directly account for informality, and in general assume that workers are formally employed with their employers paying social security contributions and labour taxes. In some cases, CGE results on low-skill wage changes are used to assess labour market effects on vulnerable populations. Such an approach, however, disregards some important characteristics of poorer households, such as lack of formal jobs, and substandard labour conditions and social protection, and can understate their reliance on governmental assistance and transfers.

These limitations can be partially addressed by linking the CGE model with micro-level data from household and labour force surveys.[48] Canada's approach is a good example of integrating more detailed labour outcomes into a CGE modelling framework in the context of an SIA. Canada's economic impact assessment of CUSMA introduces a labour market module into the GTAP dynamic model which allows for the simulation of wage and (un)employment impacts by gender, age and occupation (GAC, 2020[77]). This is achieved by making use of a CGE model that is estimated with detailed labour force data. The model also includes a more detailed breakdown of occupations to better assess mismatches in the labour market as a consequence of changes in labour demand across skills groups due to trade liberalisation. The World Bank has linked its CGE model to a microsimulation framework – Global Income Distribution Dynamics framework – that relies on data from household income and expenditure surveys and is used to generate predictions of how global inequality and poverty might evolve under different future scenarios. This tool has been used in Busso et al. (2010[78]) and most recently in Maliszewska, Osorio-Rodarte and Gupta (2020[79]). The latter study simulates effects of various potential liberalization scenarios on Sri Lanka's economy, including labour demand changes by region, poverty and inequality. Finally, the OECD has linked its METRO model with consumption expenditure data from household budget surveys to analyse the effects of trade policy induced price changes on expenditures of households at different income levels (Luu et al., 2020[80]).

The integration of micro-level modules into a CGE model allows for the assessment of the uneven effects across populations within a unified modelling framework. Although the micro-level household and labour survey data needs to be tabulated to fit the CGE specifications, it is not required for these data to be available for all the countries analysed in the CGE model, but only for the particular country or countries for which the labour- and group-specific analyses is performed.[49] The use of micro-level household data, in addition, allows for detailed income distribution (Gini coefficient) and poverty analysis. It also can be used to assess quantitatively the trade impacts on vulnerable populations and groups, which can be divided by income, skill, age, gender and geographical location, among others. A drawback is that each module considerably increases the computational complexity of the model and the inferences obtained are only as good as the underlying data.

In general, CGE models are well suited at identifying changes in labour demand by skill group and economic activity. However, these models usually employ simplistic assumptions regarding how the labour market adjusts to these labour demand changes. Labour supply is usually exogenously determined over time, at different degrees of complexity. The standard approach is to assume employment follows projections of the working-age population, combined with assumptions on medium- and long-term

[48] See Bourguignon and Bussolo (2013[88]) for a review of approaches to integrating CGE models with microsimulation frameworks.

[49] Labour market data used Canada's labour market module is sourced from Statistics Canada's Survey of Labour and Income Dynamics, Annual Demographic Estimates, and the Census. The United States' analysis of labour market effects of USMCA rely on the Current Population Survey (CPS), a representative sample of 65 000 US households, the National Survey of Occupation and Employment (ENOE), a quarterly survey of over 120 000 Mexican households and the Labour Force Survey (LFS), a monthly representative survey of 54 000 households across Canada.

unemployment, and constant or projected changes in participation rates by gender. In such models, shifts in labour demand are channelled almost exclusively through wage changes (Box 2). In some cases, wages are held constant to reflect a sticky-wage situation that is better suited to analyse short-term changes in the labour market. This can reflect a situation where institutional labour settings do not allow nominal wages to decrease in the short-term and the labour market can only clear if less people are employed. Under these conditions, a decrease in labour demand will be reflected in job losses. However, both settings are extreme and in reality, the adjustments of the labour market are a combination between changes in wages and employment, including involuntary unemployment.[50] The empirical implementation of a setting with endogenous labour force participation, unemployment and wages is a complex undertaking with specific data requirements on labour parameters. However, such a setting has been already implemented in some CGE models (Box 2).

Box 2. Approaches to unemployment modelling in CGE models

Boeters and van Leewen (2010[81]) model labour supply at both the intensive and extensive margins, as a household-specific optimisation decision between the expected utility of employment and the fixed costs of taking up work. They employ OECD data on labour taxes and unemployment benefits to calibrate the elasticities for both the intensive and extensive margins. They then model involuntary unemployment using a sector-specific right-to-manage model of collective bargaining where firms and trade unions bargain over wages, and firms determine the level of employment.

Other labour supply modelling and calibration options are available, and unemployment can also be determined by efficiency wages or search and matching mechanisms (Boeters and Savard, 2012[82]). The search-and-matching mechanism stems from the assumption that both finding and posting jobs are time-consuming and costly processes. Hence, these frictions create a certain level of unemployment, which is conditional on the efficiency of the matching process, the labour market tightness and other structural parameters of the labour market. Although several varieties of search- and matching models exist, the CGE framework only allows for very simple versions. For instance, it must be assumed that workers have homogenous productivity. The efficiency wage mechanism is based on the idea that firms can increase worker productivity by paying wages that are higher than the market-clearing level. Inversely, the threat of firing workers and/or higher unemployment levels deter workers from shirking. In both cases, there is an efficiency-wage curve, where worker efficiency is a function of relative wages. In CGE models, this is implemented as wages being negatively related to the unemployment rate, which in turn is determined by the replacement rate (i.e. unemployment benefits), the detection probabilities from the worker monitoring technology and the wage-curve elasticity.

Another possibility, that is relatively easy to model and less data intensive, is to include a reduced-form labour supply wage curve, which indirectly accounts for the labour-leisure decisions. In this setting real wage changes affect the labour supply through a wage-supply elasticity parameter. In other words, there is a direct link between real wage changes (endogenous to the model) and total employment (labour supply), which then makes the second endogenously determined based on the real wage change (instead of being fixed or exogenous). The limitation of the approach is that the leisure-work decision process is governed by a single parameter: the wage-labour elasticity, which is creating a

[50] CGE models with wage adjustments (i.e. full employment) aim to quantify the long-run effects, when the economy is back to its long-run equilibrium and hence with a full employment at aggregate level.

simple direct (linear) relation for what could be a more complex and non-linear interaction between leisure and work. In addition, this reduced form does not have labour supply constraints, assuming that labour supply will increase as much as wages and the elasticity dictate, without any consideration on the real possibilities and willingness of households to supply more labour (for instance, if unemployment rates are very low and/or participations rates are already high). This approach was used in both recent SIAs undertaken by the United States and Canada. The SIAs undertaken by Canada, moreover, have recently incorporated different labour supply elasticities by each category of workers, responding to changing labour demand across different occupations in different sectors.

An economic impact assessment of Australia's North Asian FTAs[51] provides estimates on the changes in number of jobs over the short run using the CIE G-cubed model. Integrating elements from macroeconomic models into a CGE model including a financial sector, allowing for saving and borrowing by producers and consumers, and adjustment costs for changing capital stocks. The model assumes that wages are equal across sectors, with labour being perfectly mobile between sectors, and adjust slowly according to an overlapping contracts model where nominal wages are set based on current and expected inflation, constant labour supply and changing demand for labour. Thus for given nominal wage, the labour demand in each sector will determine the short-run employment in each sector, while the economy-wide unemployment is the difference between sectoral demand and the overall labour supply.

Finally, it is important to note that CGE models are still not well suited to capture the frictional costs of employment shifts between sectors and/or occupations as a consequence of trade shocks (Boeters and Savard, 2012[82]). The models do not capture either the private costs to workers due to the cost of job displacement or the fiscal costs for the government (re-training, unemployment benefits, etc.) associated with these adjustments in the short run. One metric based on CGE results that helps to assess the magnitude of labour adjustment costs is the potential number of workers that need to change from one sector to another.[52] However, if the emphasis of the analysis is on these short-term frictional labour adjustment costs, then other methodologies should be considered, directly modelling and quantifying labour market adjustments (not using a CGE model for these).

Some SIAs have implemented a reduced-form approach that allows accounting for some labour market frictions without explicitly modelling them. The US assessment of USMCA assumed that workers could not freely move between industries in the short-run (reflecting industry-specific skills and potentially other search and matching frictions). As a result, wages were assumed not to equalise across sectors for each type of labour. Canada's assessment made use of an occupation mobility matrix from survey data to capture the likelihood of moving between different occupations and labour market statuses.

Partial equilibrium (PE) models

Partial equilibrium analysis offers a complementary or stand-alone technique employing single sector or single issue (microeconomic) models that consider the effects of a given policy action. These types of analyses typically complement the general equilibrium analysis where the relatively high sectoral aggregation of CGE models may conceal some important heterogeneities. Moreover, where sustainability

[51] The Korea-Australia Free Trade Agreement (KAFTA), the Japan-Australia Economic Partnership Agreement (JAEPA) and the China-Australia Free Trade Agreement (ChAFTA).

[52] Reporting the expected number of displaced workers, sometimes by sectors, has been a regular feature in the trade SIAs starting with the SIA for India (ECORYS, 2009[125]).

issues are difficult to incorporate into CGE models, more detailed issue-specific or microeconomic models have been used.

As noted in Section 2 and illustrated at the beginning of this section, a drawback of many SIAs is the overall lack of integration between macroeconomic (CGE) and microeconomic modelling. There have been attempts to bridge this gap in some of the EU's trade SIAs where increasingly sophisticated quantitative methods are employed, although with heavy data and computation efforts required (Rojas-Romagosa, 2021[37]). They typically take some of the simulated economic outcomes and use them as a starting point in the partial equilibrium analysis. An example is the use of environment-energy-economy model by EU SIAs, where the economic results from a CGE model are used to develop causal links to energy and environmental outcomes. Another example is an analysis of poverty and inequality using household data where changes in relative prices simulated by the CGE model are used in a microeconomic model to simulate the impact on household welfare.

Strengths and limitations

The advantage of partial equilibrium analysis is the possibility of capturing a more detailed set of channels and outcomes compared to global CGE models. PE models also tend to be more accessible and easier to implement, avoiding many of the complexities of CGE models. However, they only use a limited number of pre-determined economic variables and risk missing relevant interactions between markets. Still, these models may be sufficient for SIAs with a limited scope.

How they apply to the environmental dimension

An example of an evaluation of **environmental outcomes** is a UNEP country study of the cotton sector in China that employed the Jiangsu Agricultural Policy Analysis (JAPA) model (with PE and econometric sub-models) to examine the sustainability impacts of increasing agricultural imports due to the impact of tariff rate quotas (UNEP, 2002[83]). The model established a baseline projection for 2002 and generated a scenario on the impacts of increasing agricultural imports, in turn used to assess the environmental impacts.[53] While the analysis captured the detail of this sector's environmental impacts, a later summary of UNEP's country studies noted that this study could benefit from a CGE assessment to capture linkages with related sectors such as livestock and textiles, both of which stood to be affected by a drop in prices for feed grains and cotton, respectively (UNEP, 2002[83]); (Abaza and Jah, 2002[84]); (UNEP, 2005[85]).

The EU SIA of the proposed Transatlantic Trade and Investment Partnership (TTIP) began by applying a CGE model that was then linked to an energy model (E3MG)[54] to generate more detailed environmental results and analyse the links between energy, environment, and economy-related policies to identify environmental impacts (ECORYS, 2017[86]). In particular, the CGE model was used to simulate changes in production, consumption and prices, which were then used as input into the E3MG model to simulate

[53] Cost-benefit analysis and shadow pricing (an approach that can be challenging for issues where no market price exists), based on the level of cotton production and on analysis of the levels of inputs under existing methods of production, allowed to identify the environmental impacts generated by the decline in cultivated land area. The study found that the decrease in cultivated land and the subsequent reduced application of chemical fertilizers and pesticides would have positive environmental impacts. The move up the value chain from reduced overall production of cotton due to imports and increased production of textiles might also lead to environmental benefits, but textile production can be pollution and resource intensive, particularly for water.

[54] E3MG (Economy-Energy-Environment Model Global) is a sectoral econometric model that has been developed by the Cambridge Centre for Climate Change Mitigation with the intention of analysing long-term energy and environment interactions within the global economy and assessing short and long-term impacts of climate-change policy.

the impact on air pollution, climate change and material use, as well as the damage costs from pollutants. This model included several innovations highlighting the interconnected nature of economic, social and environmental impacts. Yet, it allowed causality to run in only one direction - from economic outcomes to energy and environmental outcomes.

How they apply to the social dimension

Quantitative methods that assess social impacts other than labour market rely on detailed data from household surveys. They typically combine changes in relative prices and wages predicted by the CGE model with information on household consumption and employment structure to simulate the impact on a range of poverty indicators and income inequality measures. (Chen and Ravallion, 2004[87]) provide an example of such a top-down integration whereby the CGE model only provides the inputs for microsimulations without any feedback from microsimulations to CGE modelling (unlike in the methodology explained in Bourguignon and Bussolo (2013[88])). This approach was applied for instance in trade SIAs of a DCFTA between the European Union and Georgia and the Republic of Moldova and a DCFTA between the European Union and Armenia (ECORYS, 2012[89]) (ECORYS, 2013[90]). In these cases, estimated price/wage changes from the CGE analysis were used as inputs for further estimating social impact outside the CGE model. This included quantifying expected changes in poverty and inequality, and quantifying welfare effects through estimating consumption effects and labour income effects stemming from price changes from products consumed and remuneration.

Input-output analysis

Input-output analysis allows tracing indirect effects of a policy that are generated by supplier and customer linkages across industries. It is based on national input-output tables which provide a breakdown of intermediate input consumption of each industry as well as a breakdown of where the output of each industry is used. Input-output analysis then calculates the value added of each industry that is embodied in final consumption of products from any other industry. For instance, when an industry's output expands because of better export opportunities, its demand for intermediate inputs increases accordingly and so does the output in industries that supply them. The increase in the demand for labour that this expansion induces is thus a combination of the direct effect in the exporting industry and the indirect effect in the supplying industries. Similarly, the change in GHG emissions is determined by emission intensity of the exporting industry as well as emission intensities of its suppliers. Input-output analysis can therefore complement partial equilibrium analysis to account for one type of general equilibrium effects captured by CGE models. As discussed in François et al. (2020[60]), it can be also applied in the scoping stage to inform the selection of industries where substantial impacts may be expected.

Strengths and limitations

The advantage of input-output models is that they are usually available for most economies. They are also less complex and easier to access and apply than CGE models. However, they are often single country-based and have no behavioural attributes. This limits the range of causal links that they can analyse and makes them more suited for analysing short-term effects, when behavioural responses are limited, than for long-term effects.

How it applies to the environmental dimension

The traditional approach in input-output analysis, based on interdependencies between different economic sectors or industries has been extended to encompass environment-related information for sectors (such as its emissions, natural resource use, land use and other external effects) to assess the environmental

impacts of trade through methods such as Environmentally Extended Input-Output Analysis (EEIOA) and/or Life-Cycle Assessment (LCA).[55] Broader EEIO tables can also be integrated into, and employed with, other data sets and models, including CGE models.[56]

Approaches relying on extended national input-output tables have been used across disciplines to identify environmental impacts associated with industrial activity, such as energy use intensity and GHG emissions. One study identified differences in energy-use and GHG emissions between Canada and United States and found that the production and consumption of goods in one country often exerts significant energy and GHG influences on the other, with concomitant policy implications (Norman, Charpentier and Maclean, 2007[91]).[57]

There have also been some notable advances in developing global multi-region input-output (MRIO) models with environmental impact assessments. Studies have moved beyond issues of energy mix and intensity and GHG emissions into areas that have traditionally been more challenging to analyse, such as biodiversity and ecosystem health, employing the concept of an "environmental footprint" associated with levels of consumption of goods and services. One study has linked threatened species to globally traded industries that produce commodities (such as agricultural crops and timber) and identified a species-related "biodiversity footprint" showing how the behaviour of consumers in developed countries threaten species in developing countries (Lenzen et al., 2012[92]).[58] Another recent multi-regional input-output approach has been developed to examine trade in, and consumption of, non-food commodities (such as garments and other manufactured products) and how this behaviour contributes to eutrophication of water bodies, beyond the agricultural sector (Hamilton et al., 2018[93]).[59] One commentator has suggested that

[55] Process-based LCA has the advantage of enabling a more flexible modelling, at a higher level of disaggregation, making it possible to analyse the impacts of single life cycle stages and products and covers a greater number of emissions and resources. It allows more flexibility in running product-specific scenarios including those related to consumers behaviour. EEIOA enables the capture of a more complete picture of economic activity, including goods and services (Beylot, Corrado and Sala, 2020[123]).

[56] EEIOA models are combined economic-environmental models that use data on inputs into, and outputs from, industries and their final consumption and value added in the form of national input-output tables. These tables are paired with environmental data on resource use and releases of pollutants from various public sources, as well as indicators of potential environmental and economic impact, using standard algorithms from input-output analysis. See also the EU-GTAP Project, which aimed to ensure that the European Commission bases its trade modelling analysis on the most reliable and recent Supply, Use and Input-Output tables as inputs to its modelling tools, mainly the GTAP database (Rueda-Cantuche et al., 2015[124]).

[57] This study employed an economic input-output life-cycle assessment (EIO-LCA) to estimate the economy-wide energy intensity and GHG emissions intensity for 45 manufacturing and resource sectors in Canada and the United States. It found that US manufacturing and resource industries are around 1.15 times as energy-intensive and 1.3 times as GHG-intensive as Canadian industries, with significant sector-specific discrepancies in energy and GHG intensity. This trend was due mainly to a greater direct reliance on fossil fuels for many US industries, in addition to a highly fossil-fuel-based electricity mix in the United States.

[58] In this study, species data was taken from the International Union for the Conservation of Nature Red List. The model showed that nearly one-third of threats to global species were due to international trade, with the United States, the EU and Japan as the main final destinations of the most destructive biodiversity-implicated commodities (led by coffee, rubber, cocoa, palm oil, fisheries and forestry). Trade and environment related policy implications could relate to regulation, sustainable supply-chain certification and labelling.

[59] This study found that clothing, goods for shelter, services and other manufactured products accounted for 35% of global marine eutrophication, and 38% of the global freshwater eutrophication, footprints in 2011. Limitations remain in that the model has a limited country resolution and is based on average monetary trade flows at the sector level (which, for example, do not account for differences in commodity prices).

more research is needed on how and where consumption contributes to environmental tipping points at the local level in order to provide additional support to policy makers (Wiedmann, 2018[94]).

How it applies to the social dimension

MRIO analysis could also be used similarly to investigating environment impact in order to look at changes in "jobs content" of trade, with data both on the value of labour (i.e. total wages) and jobs. This analysis could complement the CGE analysis by providing further insights on jobs and labour costs. Cali et al (2016[95]) built such a dataset and provided some descriptive analysis of labour content of exports across different regions over time. More specifically, they built two data sets on the labour value added and the jobs content of exports, decomposing the contribution of jobs and wages to exports separately through their direct and indirect components (including both forward and backward linkages), and by skill level. While this study was not an SIA, the same methodology could be used to look at the change in job content of trade before and after a trade agreement (using updated data from CGE analysis). Questions such as how much labour income or how many jobs are supported by exports from a specific sector, such as chemicals, in a country or how much of that is via linkages to sectors providing inputs for chemicals and how these change after a trade agreement could be answered.

Ex post econometric assessments

Econometric modelling of implemented trade agreements (i.e. *ex post* modelling) can be used to gauge the impact on specific outcomes of interest in an *ex ante* setting. The advantage of such historical case studies is that they capture some of the broader effects of trade agreements resulting from changes in foreign direct investment, immigration, and international technology diffusion, which are not typically included in CGE models (Sampson, 2019[96]). They may also be useful for analysing the impact through channels that are difficult to incorporate into CGE models. Moreover, *ex post* econometric assessments of FTAs can provide a useful guidance for future *ex ante* SIAs.

The US analysis of the collective bargaining provision in the USMCA[60] used an econometric model to estimate its impact on Mexican wages. It involved estimating the union wage premium based on microdata on wages and unionization status. The estimated wage changes were then used as an input in the CGE model to integrate the issue with the overall economic analysis.

For its most recent EA on the Canada-US-Mexico Free Trade Agreement (CUSMA), Canada reviewed selected literature on environmental impacts of NAFTA to apply "real, *ex post* observations" to the assessment. Using existing studies, the assessment was based on limitations associated with those studies, such as the challenge of isolating the agreement's effects combined with data limitations. The authors looked at findings related to regional impacts, pollution havens, production intensity, air pollution and GHG emissions, transportation, technology, investment, and capital (GOC, 2020[97]).

Strengths and limitations

Ex post econometric assessments are crucial for identifying causal links and their potential importance in the scoping stage of SIAs. They can also complement other quantitative approaches in the main analysis because, as long as appropriate data exist, they are versatile in estimating a broad range of causal linkages. The main limitation is the difficulty of obtaining causal estimates of the parameters of interest,

[60] The provision stipulates that Mexico should introduce new legislation regulating collective bargaining procedures, leading to better worker protection and higher wages as a result of stronger unionization.

i.e. isolating the impact of trade policy from other factors that affect trade and sustainability outcomes at the same time.

How quantitative methods apply to the human rights dimension

While economic modelling is a crucial means of identifying economic effects of trade agreements that may have human rights consequences, it does not, of itself, amount to a "human rights respecting" process, as defined by Walker (2009[55]).[61] This limitation is addressed, in practice, by supplementing findings from the "economic" and "social" components of the SIA with more detailed work with stakeholders (Section 3.3).

The "integration" of human rights considerations into the wider set of sustainability dimensions assessed with quantitative methods has also consequences for issue selection (Table 3). The emphasis placed on economic modelling, together with the expectation that human rights components will draw from the economic modelling work done for the purposes of the "economic" and "social" aspects, risks influencing the human rights analysis and findings in important ways. The common assertion in EU SIAs that "*the fact that a trade measure will have a greater economic effect on the smaller (i.e. non-EU) economy justifies focussing almost exclusively on the non-EU economy for the purposes of the human rights analysis"* is an illustration of this effect. Still, the actual consequences are unclear, partly due to the flexibility enjoyed by consultants in the SIA process and the subjectivity that surrounds some aspects of the screening process.

Table 3. Trade-offs associated with different approaches to HRIAs

Approach	Advantages	Disadvantages
Integrated (carried out in conjunction with other sustainability dimensions)	Can draw from findings from economic, social and/or environmental parts of the analysis. Possibility for exploring links between different "sustainability" issues; more sophisticated "holistic" analysis; potential to reveal more creative solutions to problems. More "real-world" (less "legalistic") analysis. Potential for efficiency gains; reduced costs.	Risks diverting attention from the nature of human rights as *legal* rights. Risk of perpetuating artificial distinctions between human rights and economic, social and environmental issues. Human rights analysis may be distorted by other components of analysis (e.g. leading to prioritisation consequences of economic and social effects).
Standalone	Greater potential for human rights to be explicit subject of analysis; assessment more likely to reflect the special status of human rights as *legal* rights (i.e. as opposed to desirable policy goals and aspirations). Greater attention likely to be given to ensuring "human rights respecting" process at all stages; greater focus on participation and capacity building.	Difficulty sourcing information needed for economic, social and/or environmental parts of the analysis. Less opportunities for exploring links between different "sustainability" issues. Relevant economic, social, and environmental issues (i.e. as potential triggers for human rights problems) may be overlooked. Risk of more "legalistic" (less "real world") analysis.

Furthermore, human rights impacts are often not so easily separated from "economic", "social" and "environmental" ones. For instance, an *economic effect* such as increased competition from foreign producers, may have a *social effect* of increased unemployment within a community, which has, in turn, gender equality implications if the people most adversely affected are women, making this a *human rights effect*. Or, to take another example, an *economic effect* such as a boost to the logging sector might produce an *environmental* effect of deforestation which then could produce *human rights effects* if this were to result

[61] Walker stresses the need for the human rights assessment process itself to respect human rights. This would imply viewing potentially affected people as "both the central subject of the assessment as well as an active participant and beneficiary of it", entitled to participate meaningfully in the assessment process. It would also call for the process's transparency and build-in accountability as regards outcomes.

in displacement of indigenous communities. The implications of using economic modelling techniques as the primary or only "jumping off point" for more detailed enquiries is illustrated below.

3.2. Hybrid methods

Causal Chain Analysis (CCA)

Causal Chain Analysis is an inference-based analysis that links economic outcomes from a quantitative model to sustainability outcomes. Various conceptual frameworks can be used to guide a qualitative analysis along a causal path from identified economic impacts to sustainability effects. The indirect links from the economic output (macro or sectoral) provide, at the very least, the basis for a linear analysis of key sustainability effects. This analysis can be rooted in economic theory, existing data sets, or in the social sciences drawing on non-quantifiable resources including, importantly, a broad diversity of expert and stakeholder knowledge. CCA hypothesises causal relationships between the economic consequences demonstrated through the quantitative analysis and any environmental or social sustainability impacts.

Strengths and limitations

CCA is a key approach for identifying and assessing many sustainability impacts of FTAs that cannot be directly incorporated in the CGE model, using both qualitative and quantitative means. It can be critical in distinguishing significant from less significant cause-effect-links in the chain and narrowing down the assessment to a manageable scope that will allow appropriate in-depth analysis. However, an excessive reliance on qualitative inference-based assessments, instead of direct quantitative tools, is a speculative approach that may significantly reduce the usefulness and the quality of the analysis (Rojas-Romagosa, 2018[98]). Another key limitation of this methodology is that the lack of quantitative estimations also limits its capacity to prioritise on the most relevant and politically important effects, or to deal with trade-offs when different conflicting effects are expected. A more systematic and comprehensive approach, supported by quantitative indicators and methodologies can improve the robustness of this method, but this would be subject to the same data limitations as the quantitative methods described in Section 3.1.

How it applies to the environmental dimension

Identifying environmental impacts often involves analysis through a causal chain that links changes in the economic variables to environmental issues and indicators. Environmental impacts can be traced through air, water and land pollution and from changes in demand for natural resources and their degradation. Several conceptual frameworks exist, notably the scale-composition-technique framework (employed by Canadian and some EU studies) and the OECD's approach employing product, scale, structure, technology and regulatory effects (employed by the United States). Both can be used to guide a quantitative and/or qualitative analysis along a causal path from identified economic impacts to environmental effects.

For instance, an early trade SIA of the WTO negotiations on food crops identified production systems as the critical link among trade reform, economic structure and sustainability and environmental impacts (Maltais, Persson and Nilsson, 2002[99]) (UNEP, 2005[85]). Analysis of water resources can usefully follow a direction suggested by the economic impacts of trade measures on specific resource and sectors. In the agricultural sector, intensification of production has been linked to the increasing use of inputs (fertilisers and pesticides), with implications for soil and water quality and increasing pressure on land and water (LSE, 2020[75]).

How it applies to the social dimension

In the context of social outcomes, many EU SIAs use the CGE estimated changes in sectoral employment and production to make inferences on how these changes may affect female employment, labour conditions and other social issues. As another example, CGE results on low-skill wage changes have been used to assess labour market effects on vulnerable populations. Such an approach is simplistic because it disregards important characteristics of poorer households, such as lack of formal jobs, substandard labour conditions and social protection, and their reliance on governmental assistance and transfers.

Case studies and sector studies

Case studies and sector studies provide on-the-ground empirical insights and results that more aggregated techniques such as economic modelling do not. They have been used extensively by academics, governments and international organizations to supplement economy-wide approaches, and to identify concrete linkages between economic and sustainability impacts of trade. Well-informed identification of relevant sectors or cases at the scoping stage is critical in this regard (Section 2). [62] In order to clearly identify and separate specific trade impacts from other changes, case studies need to sufficiently develop or explain their methodology and pay particular attention to the examination of causal chains. The sectoral approach is in principle not meant to be used alone in the context of *ex ante* impact assessments of trade agreements, as its exclusive use does not allow to effectively capture cross-sector or economy-wide impacts, and can fail to isolate trade-related effects from other factors (UNEP, 2001[20]) (Blobel, Knigge and Görlach, 2005[36]).[63] To counter this, both UNEP and the CEC encouraged consideration of upstream and downstream impacts to address cross-sectoral impacts. Such cross-sectoral considerations may, for example, highlight positive impacts from the procurement of efficient technologies using "green procurement" practices and from implementing policies on environmental management and stewardship which mitigate negative environmental impacts (GOC, 2017[29]) (GOC, 2018[30]).

Strengths and limitations

Case studies involving local experts are among the most useful methods for assessing some impacts and understanding local concerns (Kirkpatrick and George, 2006[14]). Sector studies are also particularly useful in collecting detailed empirical data (UNEP, 2001[20]) (Kessler and Abaza, 2006[21]), so as to identify specific and distinctive sustainability effects, and devise well-targeted policy measures.[64] Their main limitation is

[62] Criteria have been developed by organizations including the CEC, the EU, UNEP and WWF. The Government of Canada uses data from its modelling effort which presents estimated output changes at the sectoral level (reallocation of resources across sectors) to identify key sectors that would most likely be affected by increasing trade (using indicators of imports and exports). UNEP asks whether (a) there is a related sector that is a major input into and/or consumer of the sector under consideration (b) there are economic or environmental dynamics that cross over from one sector to another (c) there is a sector that has important environmental or social impacts related to the sector under consideration (UNEP, 2001[20]).

[63] There are ways of controlling for this effect such as the approach adopted by the CEC that incorporates inter-sectoral analysis by encouraging consideration of upstream and downstream impacts. For example, in a study on cattle feedlots in North America, the CEC's analysis extended back to the feed-grain sector and forward to the beef processing sector (CEC, 1999[18]).

[64] According to Carpentier (2006[126]), sectoral assessments under NAFTA generally yielded the most rigorous and precise conclusions about the environmental impacts of the agreement, translating into increasingly useful policy recommendations thanks to the increased specificity of findings.

the difficulty of generalising the findings to other regions, countries, sectors or instruments, even with comparative studies using structured focus comparison.

How they apply to the environmental dimension

Sectoral approaches and case studies usually drill down into key traded sectors which might have important environmental impacts, and can produce unexpected findings that challenge common widely-held assumptions. For example, the recent SIA on the EU-Indonesia trade agreement used in-depth sectoral analysis of the vegetable oil and oilseeds sector, finding that the agreement would re-orient exports of palm oil more towards the European Union and away from other current importers, but would not lead to an overall expansion in production (Development Solutions, 2020[100]). The CEC extensively used both case and sectoral studies. The former have demonstrated that trade liberalisation does not automatically lead to clean technology transfer, greener supply chains or upward harmonization toward global standards, so active policies are necessary for proper incentives to incorporate environmental protection (Gallagher, 2004[101]). The latter highlighted that aggregate data may mask important diverging conditions at the local level; that improvements to environmental monitoring activities are key to conducting a disaggregated analysis; and that highlighting scale and compositional effects of trade liberalization deserve at least as much attention as competitive effects.

All EU SIAs also employ sector studies in support of their assessment of environmental impacts. They are typically based on quantitative assessments complemented with qualitative methods, working through a causal chain that considers scale, composition, and technology effects, along with regulatory impacts. The recent EU-MERCOSUR SIA used CGE modelling of imports, exports and output to analyse the environmental impact on the beef, dairy and sugar sectors. The environmental analysis subsequently focused on land use and GHG emissions, followed by qualitative judgements related to scale and production techniques. It found that production practices could lead to negative environmental impacts (for example on soil, pollution, water consumption and run off) but that these could be mitigated by MERCOSUR countries investing in modern facilities employing cleaner technologies (LSE, 2020[48]). A similar approach in the EU-Mexico SIA found that the agreement could increase trade in environmental goods and services, with beneficial effects for the environment (LSE, 2020[75]).

Field Research: Participatory Rural Appraisal (PRA)and quantitative and qualitative surveys

PRA refers to, “a growing family of approaches and methods to enable local people to share, enhance and analyse their knowledge of life and conditions, to plan and to act” (Chambers, 1994[102]). Here local people gather, analyse and interpret their own information, and develop community action based on local values, priorities and resources. PRA tools (such as causal link diagrams, matrix rankings, and community mapping) have been applied to indigenous environmental knowledge, natural resource management and climate change at the local level and have integrated local voices, values and knowledge into action plans on sustainable community and resource development (Sandham, Chabalala and Spaling, 2019[103]).

Surveys are methods for gathering information from a selected sample, to gain insights and data on the assessed sustainability dimensions. They can be qualitative or quantitative, depending on the types of questions included. Qualitative surveys explore stakeholders or experts opinions, views and motivations, while quantitative surveys collect facts and numbers.

Strengths and limitations

PRAs and surveys can bring significant depth to the analysis, but are often quite localised and less appropriate for covering combinations of problems. They require careful design to avoid selection bias and

perception bias that yield inaccurate results. When they focus on qualitative information, surveys may also be difficult to analyse.

3.3. Qualitative methods

Given the limitations of quantitative approaches, qualitative methods usually complement the analysis of sustainability impacts. Existing assessments of trade in environmental goods and services (EGS) tend to be largely qualitative, consisting, for example, of reviews of existing studies to identify emerging markets for EGS, opportunities to develop alternative energy technology, and statistical information, such as the patent applications related to climate change mitigation goods and potential benefits from knowledge and technology transfer (LSE, 2020[75]). Impacts on land use and deforestation from expected expansions of relevant agricultural sectors, which depend critically on the regulatory framework to reduce the rate of deforestation related to farming activities, also tend to be covered through descriptive analysis (LSE, 2020[75]).

Qualitative approaches also work well for assessing regulatory and institutional issues, such as compliance with domestic regulations, multilateral environmental agreements, ILO Conventions on core labour standards or other human rights obligations and commitments, and Trade and Sustainable Development (TSD) chapters within trade agreements (LSE, 2020[75]). They provide a good framework for assessing the ability of state and local authorities to regulate with respect to sustainability matters ("right to regulate"), or the flexibilities that they may be afforded under the multilateral trading system.[65]

The main methods under this category are regulatory/legal analysis and stakeholder consultation and public participation, including focus groups. Tools such as direct observation, participant observation, field research, focus groups, interviews, expert observations, questionnaires, and desk research further support the collection of information that can be analysed through tools such as matrices and/or causal chain analysis.

Regulatory/legal analysis

Regulatory and legal analysis are meant to clarify the economic, environmental, social regulatory and legal context for an accurate "baseline" picture, mapping the environmental protection and social and human rights obligations and commitments of the partner countries. The EU-MERCOSUR SIA found that "MERCOSUR countries' ability to meet obligations under MEAs or to make commitments in new policy spheres will depend (…) on the commitment of individual trading partners to maintain and enforce their own regulatory framework …" (LSE, 2020[48]).

In addition to questions about the content, structure and terms of the agreement itself and the manner in which it will be implemented in practice (including its economic effects, the implications of the trading partners' economic policies and the extent to which options for flanking measures may be available in practice), the SIA needs to consider the overarching legal and structural issues (e.g. the operation of applicable international – trade, environmental, labour or human rights – provisions and the inter-relationships between them). For a full picture of the potential impacts of a proposed agreement, the assessment process needs to take account of "both the *obligations* likely to be included in a proposed trade agreement and the *exceptions* these obligations are likely to be subject to" (Zerk, 2019[52]). This is

[65] Including WTO exceptions relating to 'public morals', measures 'necessary to protect human life and health' and flexibilities for developing countries to impose import restrictions to protect infant industries or subsidize vulnerable producers that could be relevant to the ability of trading partners to respond to emerging challenges (Zerk, 2019[52]).

because exceptions (or "flexibilities") may be able to be used by governments to mitigate adverse impacts of trade agreements in practice.

Strengths and limitations

Regulatory/legal analysis should not be viewed as second best solution when quantitative analysis is not possible. It is important in its own right for understanding the potential of specific provisions in the agreement to support or impede the achievement of sustainable development objectives. However, it is important not to confine these inquiries to what is *legally* possible. There will be many cases and contexts "in which theoretical policy choices may not be available in reality. Governments, particularly in developing countries, may be constrained by political factors, power imbalances between trading partners, or perhaps by requirements imposed by international financial institutions. In these circumstances, it is important that (…) impact assessments do not blur the distinction between what a trade agreement requires the parties to do and the likely effects of the agreement, given economic and political realities" (Zerk, 2019[52]).

How it applies to the environmental dimension

There is a variety of potential regulatory impacts on the environment, including impacts on land use and deforestation from expected expansions of relevant agricultural sectors, which depend vitally on the regulatory framework to reduce the rate of deforestation related to farming activities (LSE, 2020[48]). However, Reynaud (2013[57]) has suggested that environmental effects of trade-related regulatory responses are often covered in less detail than economic impacts, even when emerging issues warrant a thorough and comprehensive analysis. He raised the example of intellectual property rights, which arguably received cursory attention in the EU-Korea SIA despite the key role stronger IPR enforcement could play for promoting sustainable development through the diffusion of newer technologies, including for environmental protection.

The approach to regulatory impacts in earlier environmental impact assessments, such as the Canada-Korea EA, often came down to general assertions that the parties would maintain their right to regulate in the public interest and protect their environment, and that they would promote further cooperation under MEAs (Reynaud, 2013[57]). More recent environmental impact assessments, such as Canada's EA on CETA, take a more detailed overview, including a robust discussion on selected sectors and issues. They also propose mitigation and flanking policies such as those that targeted investment in programs and technologies to reduce environmental footprints, along with cooperation and laws binding foreign investors to the same environmental regulations that govern domestic investors (GOC, 2017[29]).

How it applies to the human rights dimension

In order to prepare a plausible "baseline scenario" for a human rights impact assessment, as well as a series of indicators to help measure and track the human rights impact of a trade-related measure, practitioners have a range of resources to draw from. However, these vary in terms of availability, reliability and the uses to which they may be put, as sets out in the illustrative list of Table 4.

Table 4. List of key sources of information used in SIA human rights components

Source	Type	Useful for …	Less useful for…	Available and reliable?
Treaty bodies	Treaty texts Ratification records	Understanding levels of political commitment to addressing human rights challenges.	Understanding levels of compliance with human rights obligations and commitments *on the ground*.	Readily available from public sources. Highly reliable
	Reports of treaty monitoring bodies	Understanding general levels of compliance with human rights obligations and commitments.	Detailed sectoral information. Detailed understanding of experiences of rights-holders *on the ground*.	Reliability and comprehensiveness of reports of monitoring bodies can vary (e.g. depending on quality of information submitted by States and other parties, resources for inspections etc).
UN agencies	Regional/ country level/ sector level reports	Understanding levels of political commitment to addressing human rights challenges. Gaining a deeper understanding of structural and thematic issues. Understanding levels of compliance with human rights.	Detailed understanding of experiences of rights-holders *on the ground.*	Readily available from public sources. Authoritative and reliable, although quality and level of detail and coverage may vary (e.g. depending on quality of information submitted by States and other parties, resources for inspections etc).
Regional bodies	Country/status reports Health, educational surveys	Understanding of current challenges and trends that may influence the human rights situation over time.. Sectoral, structural, geo-political and resources challenges.	Detailed understanding of experiences of rights-holders *on the ground*.	Readily available from public sources. Authoritative and reliable, although quality and level of detail and coverage may vary (e.g. depending on quality of information submitted by States and other parties, resources for inspections etc).
National government; ministries	Current and proposed legislation Policy documents and position papers Consultation responses	Understanding levels of political commitment to human rights issues. Regulatory and law enforcement challenges; structural challenges. Prospects for law reform likely to result in (short and medium term) improvements in levels of human rights compliance, and greater realisation of rights.	Detailed understanding of levels of compliance with human rights obligations and commitments.	Generally readily available from public sources. Largely reliable, may require local knowledge and expertise to fully interpret.
National human rights bodies	Public statements Publications Reports (examples of outcomes of inquiries)	Understanding levels of compliance with human rights obligations and commitments. Sectoral, thematic issues and challenges; structural challenges.	Understanding future intentions of government, prospects for reform.	Generally readily available from public sources. Reliability may vary, depending on level of independence from government and available resources.

Source	Type	Useful for …	Less useful for…	Available and reliable?
Civil society organisations (local and international) + Trade unions	Studies and reports Oral and written accounts Case studies Statements	Understanding levels of compliance with human rights obligations and commitments. Understanding nature and scale of impacts on specific individuals and communities.	Understanding future intentions of government, prospects for reform.	Generally readily available, including on-line. Reliability likely to vary, depending on underlying data, resources, as well as independence and agenda of organisation.
	Various kinds of indices or "ratings" systems (e.g. relating to transparency, corruption or civil liberties)	Understanding levels of political commitment to human rights issues, relative to other States. First-hand accounts from affected people and communities; detailed understanding of stakeholder concerns, including emerging issues.	Understanding future intentions of government, prospects for reform. Understanding nature and scale of impacts on specific individuals and communities.	Generally readily available, including on-line. Reliability likely to vary, depending on underlying data, resources, as well as independence and agenda of organisation.
Other	Academic research Press reports	Depends on subject matter, but potentially: Understanding levels of compliance with human rights obligations and commitments, including on a sectoral or thematic basis; understanding structural challenges and issues. Highlighting specific areas of risk and public concern, including emerging issues.	Depends on source and subject matter .	Generally readily available via online and other public sources. Reliability will vary.

Stakeholder consultation and public participation

SIAs generally give a central role to stakeholder consultation and public participation, considering them essential for substantive quality and procedural legitimacy (European Union, 2016[51]). They help identify and analyse economic and sustainability effects, particularly by providing local input and indicators. The EU SIAs include a continuous and wide-ranging consultation process throughout the drafting process to ensure a high degree of transparency and the engagement[66] of all relevant stakeholders inside and outside the European Union, including representatives from developing countries and LDCs, as relevant. The CEC work on the linkages between trade and environment also pointed to the vital importance of engaging stakeholders early and often (CEC, 2002[35]). Stakeholder consultations typically include representatives from NGOs, industry, trade unions, consumer groups, professional associations, and academics, and can extend to members of the broader public (OECD, 1994[17]). In its IATRP work, UNEP has partnered with national institutions to facilitate meetings in countries implementing the assessment and has hosted groups

[66] Beyond their role in providing information and insights to the SIA process, consultation and public participation has a positive influence on policy and decision-making in the countries involved, increasing awareness among policy makers concerning the environmental and social impacts of macroeconomic policies and leading to the adoption of recommendations and the development of tools for implementation in other sectors (Kessler and Abaza, 2006[21]). UNEP-supported environmental assessment studies use consultation to build capacity and channel technical assistance in developing countries, identifying and assembling relevant ministries and affected stakeholder groups and fostering inter-departmental cooperation (Ferretti et al., 2012[105]). George and Yamaguchi (2018[127]) highlight that monitoring programs undertaken with the collaboration of civil society stakeholders are considered as some of the most effective ways to ensure enforcement of environmental provision in trade agreements.

of representatives from national institutions in Geneva, both to share their experiences with each other, and to receive feedback and guidance from international experts.

Countries increasingly engage in proactive efforts to engage systematically and continuously with a wider range of stakeholders using a broader range of tools, including workshops, town halls and roadshows, before, during and after the negotiation of agreements. This public participation is a two-way process of information sharing and education, and helps sustain support for rules-based trade (OECD, 2019[104]).

Meaningful stakeholder engagement implies inserting public consultation upstream, but this can be constrained by the traditionally closed trade negotiating process. Compromise solutions such as limited disclosure to public advisory committees and identification of key substantive provisions (Salzman, 2001[59]) or detailed and timely discussions of the sustainability implications of varying negotiating options while the negotiating texts remain undisclosed (American Lands Alliance et al., 2000[58]) could help address this challenge. Civil society organisations (CSO) are increasingly involved earlier in the process, access a greater range of information, sometimes enjoy direct access to negotiations (either as part of the delegation, through side rooms or within formal Advisory Groups providing ongoing feedback) (OECD, 2019[104]).

Focus Groups is a particular method for ensuring public participation, in the form of planned discussions among a small group of stakeholders facilitated by a moderator to obtain information about people's preferences, values and opinions on a planned measure or expected future developments in a sector or subject. It is especially useful initially to explore concepts, generate ideas and focus an assessment where judgements about significant impacts ultimately involve applied values not reducible to technical calculations. Focus group participants can develop normative scenarios by discussing preferences and desirable future developments. They can gather input for such scenarios from stakeholders on expected future developments and their expectations (Ferretti et al., 2012[105]).

Strengths and limitations

Consultation and public participation enhance understanding of specific interests and concerns of various stakeholders. They are especially useful for identifying or highlighting concerns that may be specific to the agreement in question and for exploring horizontal issues and sustainability-relevant regulatory and institutional impacts.

One of their most important challenges is ensuring the representativeness and comprehensiveness of stakeholder engagement. The broader scope of issues under consideration implies broadening the conversation to wider groups of stakeholders and more specialised expertise (OECD, 2019[104]). Transparent consultation processes can help to address concerns that may arise about the fairness and inclusivity of stakeholder engagement processes (e.g. where there are concerns about vested interests, or that disproportionate weight and access might be given to the views of certain, favoured groups). Proactively seeking to engage stakeholders who are 'able but unwilling' or 'willing but unable' to participate in the public debate can also help secure the opinion of groups that are typically less represented, such as SMEs, women, new entrants and foreign stakeholders (Korinek, Moise and Tange, 2021[44]).

This also involves striking a balance between geographic and substantive scope and the necessary and available time and resources (Ferretti et al., 2012[105]). The EU SIA process calls for the broadest consultations, which occur at various points in the development of the SIA, both within the EU and in trading partners as a way to access local knowledge. Such a comprehensive approach is expensive and requires significant time and human resources to organize and manage. A more streamlined approach involves consultations in national capitals (such as occur in Canada and the United States) where a meeting to consult with stakeholders is organized and run by government officials at one or more points in the process.

How they apply to the human rights dimension

Consultation and public participation are as relevant for all sustainability dimensions, but play an additional role as regards the human rights dimension: they provide a means to pursue a "human rights respecting" process (see footnote 53). Detailed work with stakeholders, in the form of public surveys (e.g. to help clarify levels of public concern about specific issues), workshops, case studies, focus groups, "town hall" type meetings and face to face interviews can help ensure meaningful participation for potentially affected people. The EU handbook makes it clear that meaningful stakeholder engagement is a critical part of an effective SIA process (European Union, 2016[51]).

Economic modelling provides a reasonably robust set of future scenarios from which to extrapolate a range of different human rights effects, by contributing to the understanding of impacts potentially associated with the implementation of trade agreements. However, the human rights consequences flowing from the terms of the agreement itself (e.g. constraints on the State's "right to regulate" investments or services), the magnitude of which may be unrelated to, or show only a weak correlation with, projected economic impacts, requires different fields of expertise. Legal and specialist policy expertise can help understand the practical consequences, if any, of intellectual property provisions for access to medicines. Politics and public affairs expertise can help understand the practical and political constraints that may have a bearing on the extent to which a range of different risks may be mitigated (e.g. through domestic policies), and the extent to which any human rights related safeguards written into an agreement are likely to be observed and enforced in fact.

Table 5. Main methods of collecting and analysing data for the purposes of human rights impact assessment of trade agreements, and their relevance to different sources and types of human rights "impact"

Highly relevant and probative | Potentially relevant and probative | Of more limited relevance

Technique	How relevant is this technique to…					
	Identifying possible conflicts between trade terms and HR commitments	Quantifying the effects on "regulatory space" to address future human rights challenges	Identifying human rights impacts arising from economic effects of the agreement	Assessing risks of a "race to the bottom"	Assessing the economic factors that will have a bearing on how the agreement is implemented in practice*	Assessing the political, structural, and other factors that will have a bearing on how the agreement is implemented in practice**
Economic modelling						
CCA						
Public surveys						
Face to face work with stakeholders						
Expert opinion, analysis						

* Including an assessment of the extent to which the State is able to make use of flanking measures to mitigate impact.

** Including an assessment of the ability of the State to make use of "exceptions" or "flexibilities" provided for in the agreement, in reality as well as in theory.

4. Analytical methods: Challenges and limitations

SIAs face a number of challenges that complicate their use and influence the relevance and robustness of the outcomes, potentially undermining their policy impact in practice. Some of these challenges are inherent to the process (and for which there is no easy answer), some are more context specific, and some are unlikely to be fully addressed without trade-offs elsewhere. A summary of organisational and policy dilemmas (or trade-offs) and the key considerations that will be relevant to how they are addressed, appears at the end of this section.

4.1. Integrating sustainability dimensions and establishing causal relationships

Pursuing an integrated approach to the sustainability impact analysis and finding the right balance between breadth and depth

The stated intention of SIAs is to pursue a "holistic" or "integrated" analysis of sustainability dimensions, but the effect in practice is, more often than not, a "siloing" of the various dimensions, with a lack of attention in the analysis to the complex and often dynamic inter-linkages that can exist between different types of sustainability impacts. Although it may be convenient for the assessment process to divide sustainability issues in this way, this entails a significant risk of missing important effects or potential trade-offs between individual and collective impacts in various dimensions.

This is particularly true as regards the human rights dimension and the capacity to reveal the diverse ways in which social and environmental impacts may raise human rights concerns, or any compromises that may appear likely between expected economic, environmental or social benefits and the enjoyment of human rights. It is important to recall that human rights are *legal* rights and, as such, have special status in law, thus adverse human rights impacts on individuals cannot be justified on the grounds of expected benefits in other economic or sustainability dimensions.

Identifying and articulating causal relationships between trade agreements and sustainability impacts

A fundamental challenge – and one that practitioners readily acknowledge – concerns the difficulty in establishing and articulating causal links between an economic intervention (i.e. for our purposes, a change in trading arrangements between two countries) and sustainability issues that may arise in the future. For instance, the assessment may anticipate that a trade liberalising measure set to boost a sector in which there are poor workplace standards might result in an increase in numbers of people subject to labour and human rights abuses at work. But *to what extent should those abuses be regarded as a consequence of the trade agreement itself, rather than failures of regulation or domestic governance*? The economic expansion of a problematic sector may exacerbate established workplace problems if no remedial action is taken. However, it may also contribute to raising workplace standards if it results in enhanced oversight from foreign buyers or potential investors or if it generates additional revenue that is then reinvested into better employment conditions. Which direction the impacts will take over time is difficult to establish but may to a significant extent depend on the inclusion of appropriate Responsible Business Conduct (RBC) provisions and of the enforcement of flanking policies at the domestic level.

Conversely, a projected downturn for a region or sector as a result of a trade liberalising measure may result in more people without employment. But, *to what extent are the resulting poverty effects the result of the trade agreement itself, or the failure of the relevant state to implement suitable mitigation strategies (or accompanying policies)* such *as sufficient welfare provision or retraining* – which also have benefits for workers displaced for reasons other than trade?

It may be possible to identify a loose causal relationship between a trade intervention and subsequent sustainability effects. Yet, the kinds of analytical work that may be possible when the trade agreement is being discussed or negotiated (whether through economic modelling, causal chain analysis, stakeholder interactions or other forms of expert analysis), will be unlikely to shed much light on their likely direction or duration over time. Moreover, the interconnectedness of economies, and their exposure to many different political, economic, environmental and health-related factors (as the Covid-19 crisis amply demonstrates), can make it difficult enough to predict the likely economic effects with any degree of confidence, let alone the sustainability effects that may flow from this.

4.2. Data scarcity and unreliable measurement systems

Dealing with unreliable or incomplete data and information

SIA practitioners often report challenges in accessing reliable data and information (including economic, social, environmental information). Even where reasonably robust global datasets exist, the collection methods may not enable the disaggregation needed to allow assessors to identify and quantify differential effects, for instance on different regions, or by gender, or on different communities or groups that may be at risk of vulnerability or marginalisation, including indigenous communities.

While this can be challenging in any jurisdiction, it is often a particular problem for practitioners seeking to carry out SIAs of trade agreements in lower income countries or to assess impacts on trading partners where such data are not available. As a result, the assessment team may need to devote significant time and effort to carrying out the research and information-gathering needed to close gaps in available information – if those gaps can be closed at all – which can have a considerable impact on the cost of the exercise. For budgeting reasons this can curtail the ability of practitioners, at a later stage, to perform the more detailed granular work (e.g. through stakeholder consultation) that could otherwise have been beneficial.

Of the various types of information that practitioners might draw upon for the purposes of a SIA, the most readily available and easily accessible *quantitative* data tend to relate to industrial and economic performance. Statistics on rates of employment in different sectors, and on levels or literacy and educational attainment (e.g. as percentages of population and/or working population) are usually readily available, from international sources, if domestic ones do not provide the necessary information.

However, the data and information needed for a deeper dive into situations within a particular jurisdiction can be far more difficult to access, assuming it exists at all. Information from regulators on enforcement activity (e.g. outcomes of inspections of factories by labour inspectorates) may be patchy or non-existent. Practitioners frequently report difficulties in researching levels of labour market informality, for instance, making it difficult to build up a detailed picture of the likely effects of a trade agreement on particularly vulnerable groups of people, such as migrant workers. Governmental statistics on some matters, such as literacy rates, educational attainment and levels of unionisation, may not necessarily be reliable and up to date (and indeed may have been subject to manipulation). Also, different governments and institutions may apply different definitions of key concepts, such as “literacy” or “poverty”, undermining the comparability of statistics collected for the purposes of the assessment.

Practitioners frequently stress the importance of access to well-resourced local experts, such as researchers, civil society organisations and advocacy groups, for helping to interrogate, verify and plug gaps in official sources of information. Such experts are also critical for a proper understanding of the various factors (political, cultural, structural, etc.) that influence the way in which the benefits of trading agreements, and their adjustment costs, are likely to be distributed among different groups in society, insights which are critical for a proper impact analysis.

At the same time, it is important for practitioners to ensure that their criteria for "issue selection" is sufficiently robust that it does not lead assessment teams to engage in "cherry-picking" by prioritising those areas and issues for which information is most readily available. While these may be the easiest to research and measure (especially in a quantifiable way), they may not be the most critical from an SIA perspective.

Formulating robust systems for measurement of human rights impacts

Human rights impacts of trade agreements can be difficult to measure and quantify. It may be possible to identify features of trade agreements that may have human rights-related consequences or implications, (or to make certain predictions about the economic and employment-related effects of a trade agreement and then to analyse these from a human rights perspective). Yet, the difficulties in formulating a robust set of measures that allow human rights impacts to be *quantified*, and then tracked over time, are well recognised.

This is partly because of the nature of human rights, which are fundamentally concerned with the harms *to the individual* (including through harms to rights enjoyed by groups). These harms are at best only partially captured by global indicators such as employment trends or levels of literacy, even where these can be disaggregated (e.g. by gender, region, or by ethnicity). Furthermore, there are many factors that will influence the magnitude and severity of harms, and the way in which harms may be experienced at a local, and then individual, level. Capturing this "intersectionality" of human rights impacts, however, would require a level of methodological sophistication that does not presently exist.

Despite these difficulties and inherent limitations, human rights impact assessment practitioners have found quantitative indicators of various kinds (and particularly those relating to issues such as employment, education and health – see Section 2.5) to be useful. They help build up a picture of underlying economic, structural and developmental issues likely to have a bearing on human rights-related risks associated with a trade proposal, and the impact the implementation of the trade agreement may have on these. Using this staged assessment approach, it is possible to draw a number of hypotheses about likely human rights impacts. These can then be tested through further "deep dive" research and consultations, in which direct engagement with affected people and communities will obviously play a central part.

4.3. Value for money

Managing costs

SIAs of trade agreements can be extremely resource intensive and expensive in practice. Resource implications cannot be the only criterion for selecting workable prior assessment strategies, as some methods that come with high upfront costs (e.g. establishing a working CGE or partial equilibrium model for the economy), can in the long run be more cost-effective than highly context-specific assessments based on case studies or stakeholder consultations, but assessment costs need to be properly managed in light of their anticipated outcomes.

This report has highlighted a number of policy questions that can be asked and of areas that can be potentially impacted in the trade context (Section 2), but these are by no means the only policy questions

that may need to be considered as part of a thorough assessment process. The scale of the information-gathering process, therefore, should not be underestimated, in particular for smaller economies engaging in such assessments. SIAs of trade agreements typically take many months rather than weeks and may involve more than a year of work by a dedicated, multi-disciplinary team. Specialist expertise is invariably required – drawing from an eclectic mix of fields such as economic modelling and analysis, government and public policy, development, environmental and energy policy, sociological analysis, anthropology, gender studies, stakeholder engagement, information and communications technologies (increasingly important in the wake of the Covid-19 pandemic), and legal expertise. Costs and logistical challenges are obviously aggravated in the case of "extraterritorial" impact assessments (i.e. assessment processes that focus on sustainability issues within the jurisdiction *of the trading partner* rather than the country commissioning the assessment).

Ensuring value for money in the context of different circumstances in the assessing country

It is also important to be realistic about what SIAs can achieve and recommend. Establishing the magnitude, or at least the relative importance, of potential sustainability impacts is important for assessing the trade-offs inherent to the trade agreement and for formulating recommendations. Yet, as mentioned in the previous paragraphs, a robust assessment is a costly and information intensive process. Ensuring that the exercise prioritises policy areas and sectors that have significant implications is thus critical.

The merit of assessing impacts on the trading partner calls for particular attention in the case of small (open) economies: beyond the difficulty for a small administration to assume the significant costs of a robust, full-fledged SIA, the robustness and reliability of results may not justify those costs in a number of policy areas. Changes in the trade patterns of small open economies will have limited implications on the partner country and worldwide compared to agreements negotiated by larger economies and may not warrant assessments where the outcomes are inconclusive, such as with respect to certain environmental or labour impacts restricted to the trading partner's domestic space.

The aspect of «openness» is also very important. If a country has very low applied tariffs on certain imports, further liberalising those in an FTA will not lead to a significant rise in imports due to the limited reduction in trade costs. Furthermore, if a country has already granted liberalised market-access to numerous other countries via FTAs, the addition of another FTA trading partner is unlikely to fundamentally alter trade flows (unless the partner country is very large). As a result the SIA should be tailored to exclude areas where only marginal effects are expected.

Recognising and responding to imbalances in resources

The complexity and expense of SIAs are likely to be factors weighing against implementing SIAs of trade agreements in many jurisdictions, and especially in less developed countries. Clearly resource constraints will not only impact the extent to which less developed countries can initiate SIAs of their own, this can also significantly impede the extent to which their governments can contribute and engage proactively in processes launched by trading partners, putting them at a potential disadvantage.

Constraints on resources and logistical challenges (such as the challenge of carrying out investigations of human rights issues in another country) will obviously have impacts on the amount of research and analytical work that can be carried out, with implications for the reliability and credibility of findings. The extent to which face to face stakeholder engagement can be successfully managed will inevitably be constrained by project budgets and timetables, sometimes to a degree that raises concerns about whether the processes undertaken and outcomes obtained within existing resources are sufficiently robust.

A further consequence of resources constraints is that, without financial support, engagement with interested stakeholder groups may be limited to those which can fund their own travel and participation (e.g. larger international NGOs, unions or stakeholder networks). While these may have important

information to share, they may not possess the detailed local knowledge (e.g. of smaller NGOs and local unions) needed to enable practitioners to build up a realistic picture of conditions "on the ground".

4.4. Policy-relevant recommendations, political sensitivities and stakeholder expectations

Overestimating the role of trade policies

It is also important for the SIAs to formulate realistic and well targeted policy-recommendations that do not call for addressing all potential impacts through trade policy. Trade agreement provisions cannot bring about positive or negative sustainability effects in isolation, but will greatly depend on their domestic enforcement as well by non-trade policies and other factors in mitigating or compounding those effects. While some impacts may be amenable to addressing through trade agreement terms (provided these can be negotiated), others may demand other domestic policies. Some impacts may be more or less pronounced depending on how an agreement is implemented in practice (as well as the government's own economic policies and the economic outlook); some may demand a combination of mitigation approaches and others may be too fundamental, structural or philosophical in nature to be realistically assessed at all.

Political sensitivities relating to the trading partner

Present patterns of SIAs with an "extraterritorial" perspective – largely conducted by (or initiated by) institutions representing one partner country but focussing heavily on sustainability issues in the other partner, particularly as regards human rights – raise legitimate questions about the fairness and objectivity of the process. They could be a source of tension and political sensitivities, no matter how well intentioned, or justified (including in legal terms) such assessments may be, especially where the assessment is conducted by the higher income country, sometimes also a former colonial power.

Understanding and managing stakeholder expectations

SIA practitioners have the flexibility to investigate a very wide range of sustainability issues within the framework of the SIA's initial scoping exercise and with economic modelling playing a central part in defining the SIA's focus. This flexibility allows them to ensure that negotiators and policy makers have at least a broad sense of the sustainability-related implications of the relevant trade proposals; insights which would then ideally inform future decision-making. However, it is not uncommon to see some SIA components also justified in legal terms. This may raise expectations, particularly among stakeholders, that the process will yield some form of legal accountability for violations – of labour, or human rights, of environmental protection – or, at the very least, that some mechanisms will be put in place for ensuring this accountability at a later stage. Given the difficulties of establishing causal relationships between trade interventions and sustainability effects these are expectations which will not be met in many cases.

This is particularly acute in the case of human rights, given the vagueness with which many of the, often aspirational, human rights commitments are expressed in trade agreements. This situation also creates dilemmas for practitioners as regards the extent to which they should try to reflect and adhere to established legal definitions in their analysis (which, for the reasons discussed above, may potentially be quite limiting); or whether a more conventional "risk assessment" approach (i.e. which speaks to human rights' "risks", "impacts" and "effects", rather than "breaches", "violations" and "abuses") would be preferable for consistency and cohesiveness with the other parts of the sustainability impact assessment. While the latter approach may be sufficient to meet the needs of the "policy tool" option described in Section 2.5, it may not provide the most robust basis for subsequent discussions between prospective trading partners about the legal implications of their proposed arrangements (and compliance with human rights obligations in particular), should that become necessary.

Table 6. Common organisational and policy dilemmas: Some factors when considering the best SIA approach

Issue/ dilemma	Approach	More or less suitable for addressing …					
		Integrated approach	Causal relationships	Data scarcity and measurement problems	Value considerations	Policy recommendations	Stakeholder expectations
Should the assessment focus on local or extraterritorial impacts?	Extraterritorial			Difficulties accessing relevant information and stakeholders Difficulties with subsequent monitoring and follow up (e.g. of implementation of findings)	Costs Logistical challenges Limited policy impact	Creates opportunities to highlight sustainability issues of concern in jurisdiction of trading partner; enhancing potential policy impact of trade-related measures	Demonstrates commitment to promoting sustainability extraterritorially Political sensitivities Contributes to capacity building within jurisdiction of trading partner; potential to lay groundwork for joint monitoring, joint action plans, etc.
	Local	Extraterritorial impacts go unexplored, and potentially unaddressed		Reduced scope of inquiry Less difficulties accessing relevant stakeholders	Contributes towards local capacity-building Fewer logistical challenges Lower costs	Reduced evidence-base for formulating and justifying sustainability related asks from the negotiating partner	Better account of local population's rights of participation in public affairs Stakeholders' questioning re strength of political commitment to addressing sustainability challenges connected with trade, and/or consistency with extraterritorial policy commitments

Issue/ dilemma	Approach	More or less suitable for addressing …					
		Integrated approach	Causal relationships	Data scarcity and measurement problems	Value considerations	Policy recommendations	Stakeholder expectations
Should the SIA process be done early on in the negotiations cycle or later?	Early	Less information on agreement's content; greater difficulties constructing plausible liberalisation scenarios		Negotiating positions need to remain confidential		More speculative recommendations, which may prove more difficult to implement.	
	Later	More information on the agreement's content	.		Less potential to influence content of trade agreement Reduced number of scenarios to model and explore with stakeholders	Less speculative findings and recommendations	
Should the process be done by relevant government departments in-house or by external consultants?	In-house		Less opportunity to learn from SIA innovations in other (non-trade) areas. Less ready access to specialised expertise		Lower costs Quicker and easier commissioning of assessments	Better flows of information between assessment practitioners and negotiators	Lack of independence; less credibility as an objective assessment; more likely to be viewed as window dressing. Greater consistency of approach; potentially greater comparability of findings For extraterritorial assessments, better capacity to recognise and manage political sensitivities.

Issue/ dilemma	Approach	More or less suitable for addressing …					
		Integrated approach	Causal relationships	Data scarcity and measurement problems	Value considerations	Policy recommendations	Stakeholder expectations
	External consultants		Greater capacity to innovate and learn from peers; access to more dynamic community of practice. Ready access to specialist expertise.		Higher costs Slower, more complicated commissioning procedures.	Less free flow of information between assessment practitioners and negotiators.	Greater independence; greater credibility as an objective assessment; less likely to be viewed as window dressing. Risk of inconsistency of approaches and findings, undermining credibility of process Reduced access by stakeholders to decision-makers.
Should assessment practitioners be given detailed, prescriptive guidance or flexibility?	Prescriptive approach	Reduced latitude to respond to novel problems and situations Reduced ability to respond quickly to new (technological, methodological etc) developments in best practice			Greater clarity as to what is expected. Clearer benchmarks against which to review performance		Reduced independence Greater consistency and comparability of approach.

Issue/ dilemma	Approach	More or less suitable for addressing …					
		Integrated approach	Causal relationships	Data scarcity and measurement problems	Value considerations	Policy recommendations	Stakeholder expectations
	Flexibility	Preserves ability to innovate to respond to novel problems and situations. Preserves ability to respond quickly to new (technological, methodological etc) developments in best practice.			Less clarity as to what is expected. Lack of clear benchmarks against which to review performance.		Preserves independence, potentially enhancing credibility of process Risk of inconsistencies in approach; contributing to scepticism about robustness of process.
Should assessment practitioners aim for a comprehensive assessment or prioritise?	Comprehensive/broad	Greater opportunities to consider inter-relationships between different issues; less risk of siloing of specific issues	Greater number of sustainability impacts likely to be identified		Over-broad process could become costly and unmanageable Potentially higher costs, and logistical challenges	Risks yielding findings that are broad but shallow, with reduced potential for policy impact	Reduces risk of disagreements between stakeholders about selection of priority issues
	Prioritise		Less opportunities to consider inter-relationships between different issues; greater risk of siloing of specific issues			Concrete recommendations more likely Potential for greater policy impact in terms of influencing negotiations	Opportunity to do more focussed deep dive work with key stakeholder groups Risk of disagreements between stakeholders about selection priority issues, undermining trust in process and outcomes

Issue/ dilemma	Approach	More or less suitable for addressing …					
		Integrated approach	Causal relationships	Data scarcity and measurement problems	Value considerations	Policy recommendations	Stakeholder expectations
Should the sustainability analysis be based on economic modelling or a mix of methods?	Economic modelling	May distract attention away from sustainability impacts unrelated to the magnitude of economic impacts and trends		Reliability depends on quality of underlying data and model assumptions		Useful indications of areas where flanking measures may be necessary Robust set of predictions of likely economic and social effects of trade agreement	Familiar to, and trusted by, policy makers.
	Mix of methods		Flexibility to choose the data collection and analytical methods that best suit the issues under investigation Dependent on the robustness of the economic baseline scenario			Lack of quantification within one framework precludes the assessment of potential trade-offs	Difficult to explain how different methods are used and the inter-relationships between them; undermining predictability, transparency and stakeholder trust
Should the assessment use primarily quantitative methods of analysis or qualitative?	Quantitative			Difficulties in formulating quantitative indicators that accurately capture the substance of sustainability issues Reliability of outcomes depends on quality of underlying data and model assumptions (e.g. extent to which data is accurate, fully comparable, etc.)	Provides an objective basis on which to track progress, and check the accuracy of predictions		Recommendations are based on robust, measurable, verifiable findings; more likelihood of being trusted by policy makers

Issue/ dilemma	Approach	More or less suitable for addressing …					
		Integrated approach	Causal relationships	Data scarcity and measurement problems	Value considerations	Policy recommendations	Stakeholder expectations
	Qualitative		Greater potential for exploring causal relationships between interventions and possible impacts, and the way in which impacts are experienced at an individual and community level	Potentially greater subjectivity involved in data collection and analysis methods, introducing a potentially greater risk of bias	Risk of being regarded as less objective, and hence less credible, by policy makers		
Should stakeholder engagement process aim for breadth in terms of scope or depth?	Breadth			Less opportunity to explore issues in detail with those with particular knowledge and experience	Cost and logistical challenges		Assessment process is less prone to accusations of bias or favouritism
	Depth			Greater opportunity to explore issues in detail with those with particular knowledge and experience			Risk of credibility of assessment process undermined by accusations of bias or favouritism

5. Conclusions

The number of negotiated trade agreements and the inclusion of non-trade provisions has increased significantly since the 1990s (Mattoo, Rocha and Ruta, 2020[106]). *Ex ante* trade sustainability impact assessments have become the main analytical tool to analyse the potential environmental, social and, increasingly, human rights effects of these agreements. These assessments not only provide policy guidance, but they also contribute to the public debate concerning trade liberalisation policies.

The range of sustainability dimensions considered in trade SIAs as well as their geographical scope vary across countries depending on their capacity and policy priorities. The particular outcomes and indicators selected for each SIA then typically depend on the nature of the agreement and characteristics of the trade partners. Trade SIAs are a complex undertaking because trade policy, through its effects on economic outcomes, can potentially affect a myriad of sustainability outcomes. Trade SIAs thus focus on the most likely and most salient potential impacts that are determined in their scoping stage. It is important for all countries undertaking an SIA to target priority areas appropriately, especially where the size of the country and its administration may make additional insights to be had from broader coverage debatable.

Each trade SIA typically employs a mix of methods that complement each other in evaluating a comprehensive set of outcomes and channels. As a starting point, most trade SIAs employ a computable general equilibrium model to assess the aggregate economic effects of the agreement. Increasingly, environmental and social outcomes are also incorporated into these models. Assessing economic and sustainability impacts in a unified quantitative framework can produce robust measurable results which allow the assessment of potential trade-offs and provide clear policy guidance. However, there are still limitations in integrating sustainability indicators directly into trade-based economic models. The CGE analysis is thus often complemented with microeconomic modelling and case studies focused on one specific sustainability outcome. Finally, stakeholder inputs and other complementary qualitative approaches are valuable in analysing complex causal linkages between trade and sustainability outcomes, such as those related to biodiversity, as well as horizontal issues and sustainability-relevant regulatory and institutional impacts. Nuance, detail, and depth in case studies and qualitative analysis can help design concrete policy measures to accompany the trade agreement.

For complex quantitative approaches to provide robust basis for policy guidance they require a range of technical and other capabilities as well as reliable data sources. *Ex ante* economic modelling can deliver objective and quantified information about potential sustainability impacts but it is sensitive to assumptions about economic interactions as well as to the numerous parameters that guide them. Building realistic scenarios thus relies on various economic as well as other specialist expertise. Providing a range of estimates based on different CGE frameworks and different parametrizations is one possible approach to improve the robustness of SIA results. Triangulation across different approaches is also important to support the conclusions of SIAs. For instance, *ex post* econometric studies and stakeholder interviews give guidance on articulating and identifying causal relationships between trade and sustainability outcomes. They may also help gauge the relative importance of the sustainability effects which can be compared with the results from *ex ante* quantitative models. These complexities make conducting trade SIAs a resource-intensive and costly exercise.

In order to make informed decisions about the various approaches and analytical methods for conducting trade SIAs in line with their specific circumstances, policy makers need to keep in mind those methods'

strengths and limitations. The practicality, comprehensiveness and detail, policy relevance, and transparency/credibility of the process are critical factors for identifying the most appropriate approaches:

- How complex and resource intensive they are
- How wide-ranging the scope of their analysis can be
- How well they translate into policy recommendations
- How comprehensive they are in enabling assessment of trade-offs, and
- How easy it is to understand what drives results.

Table 7. Typical strengths and limitations of available SIA methods

Is the method...	CGE Models	Partial Equilibrium Models	Input-Output Analysis	Econo-metric Analysis	Causal Chain Analysis	Case Studies & Sector Studies	Field Research	Regulatory/ Legal Analysis	Stakeholder Consul-tations
Data Intensive	🔴	🟠	🟠	🟠	🟢	🟢	🟢	🟢	🟢
Costly	🔴	🟠	🟠	🟠	🟢	🟠	🔴	🟠	🔴
Broad	🟠	🟠	🔴	🟢	🟢	🟢	🟢	🟠	🟢
Compre-hensive	🟢	🟢	🟠	🟢	🟠	🔴	🔴	🔴	🔴
Policy-relevant	🟢	🟢	🟠	🟠	🟠	🟢	🔴	🟠	🟢
Transparent	🔴	🟠	🟢	🟠	🟢	🟢	🟠	🟢	🟠
Objective	🟢	🟢	🟢	🟢	🟠	🟠	🟠	🟠	🔴

Note: The table presents a general assessment of typical strengths (in green) and limitations (in red) of available SIA methods. They may be upheld to a greater or lesser extent according to the specific characteristics of the agreement under assessment.

The principle of "proportionate analysis", i.e. channelling to the assessment analytical resources commensurate to the potential implications of the agreement under negotiation is even more important where the assessing economy is smaller, expecting relatively small economic effects to translate into limited sustainability impact outside the country's domestic jurisdiction.

Policy makers also need to keep in mind that even when SIAs apply complex assessment methods there are limits to what they can achieve. They serve to inform and guide public policy discussion but they may lack the details necessary to formulate concrete policies. Moreover, while some impacts may be directly linked to trade agreement terms, others may call for accompanying measures or even a combination of mitigation approaches. The cost-benefit analysis of such additional policy measures has so far been beyond the scope of any trade SIA.

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