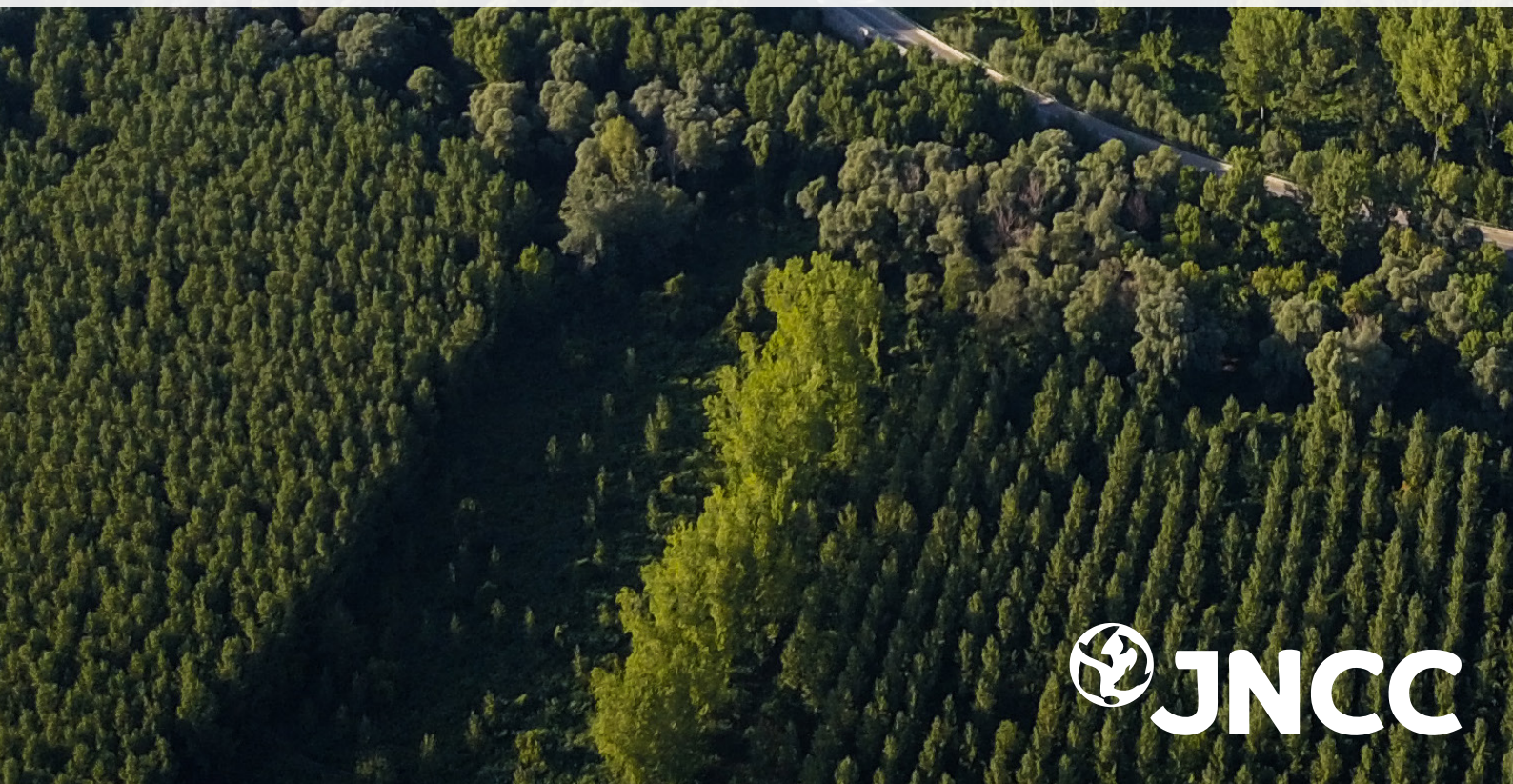
The LET Guide: Linking Environment to Trade - An Introductory Guide



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Background to the Guide

This guide summarises results of an assessment of current thinking and best practice designed to help practitioners and policy makers reduce the embodied environmental impact associated with global trade and consumption, with a focus on UK policy objectives.

It provides a quick overview for understanding tools and techniques developed to address the challenge of reducing negative environmental impacts in the production areas and along the supply chains of the soft commodities we consume.

This guide aims to:

- Provide an overview of the relationship between domestic consumption and international environmental impact and the challenges it presents.
- Introduce available tools and techniques for use in addressing these challenges.
- Identify where there are knowledge gaps in our current understanding and highlight where it may be possible to develop existing and new tools and approaches.

To do this we have:

1. Provided analysis and explanation of the environmental challenges which arise from consumption of globally traded commodities.
2. Reviewed over 250 initiatives, tools and techniques which link consumption to environmental impact
3. Analysed the types environmental impacts different initiatives address, assessed the current level of implementation, identified limitations and knowledge gaps.[1]
4. Developed five 'pathways to sustainability' syntheses that demonstrate use-cases of initiatives in understanding links between production, trade and impact.
5. Provided an extensive reference section which includes:
    a) a glossary which explains many of the terms used in this area;
    b) tools and techniques section which defines and explains the different types of approach used by different initiatives; and
    c) hyperlinks to a spreadsheet (in Microsoft Excel format) which can be used to find additional detail on specific tools and techniques that are currently available.

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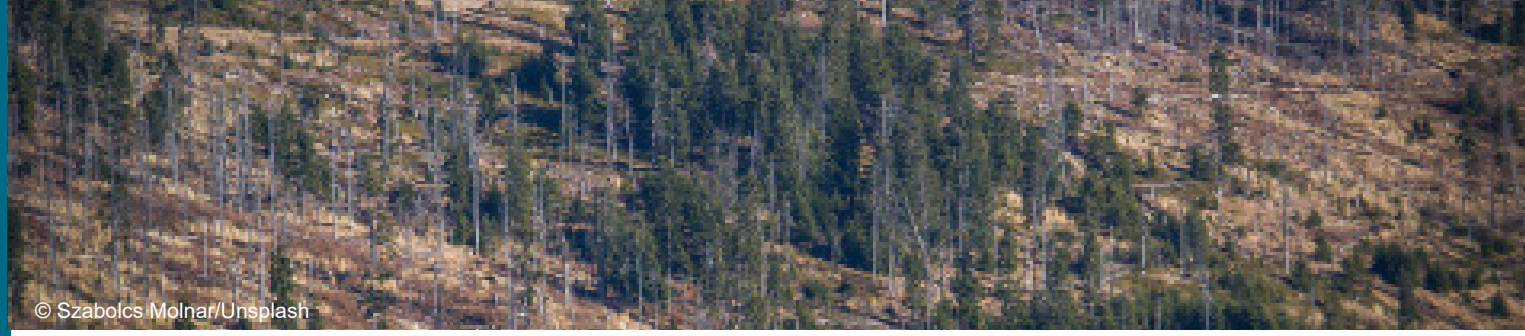
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Introduction

Around half of all food consumed within the UK in 2017 was produced domestically, 30% was imported from the EU and the remainder from other nations[2], showing that the UK is significantly reliant on land and associated resources overseas. Therefore, addressing the sustainability of consumption in the UK depends on driving sustainable trade and international production practices through influence, trade and purchasing patterns.

Globally, soft commodity production is responsible for global scale impacts on climate and biodiversity. Most of these impacts are caused by commodity-driven land use conversion, although converted land also contributes to negative environmental impacts:

- 9-14% of global annual greenhouse gas (GHG) emissions come from the gases emitted and sequestration potential lost when land is converted for commodity production which contributes to climate change[3].
- Between 2001 and 2015, 27% of deforestation resulted from permanent land conversion to produce commodities including beef, soy, palm oil, and wood fibre[4].
- Between 1986 and 2009 the global cropland footprint of UK food and feed supply increased by 23%[5].

In many of the countries where soft commodities are driving rapid impacts, the UK represents a small proportion of the total demand. Addressing sustainability of UK supply is an opportunity to show leadership in addressing impacts. It can set a precedent and demonstrates an ethical stance, which other countries may choose to follow.

Global demand is rising through population and income growth, and so improving productivity and sustainability is key to ensuring there is a secure supply in the future.

Additional environmental impacts from associated transport and processing can also occur along supply chains[6]. The complexity of supply chains and their link to environmental impacts at different stages of production makes it particularly difficult to quantify the total impacts of traded commodities on the environment.

Many initiatives exist which attempt to assess, quantify and report on the relationship between consumption and environmental impact. Technologies and methods that seek to address this complex problem have been established and overall this area is maturing. However, demonstrably linking consumption to environmental impacts and possible mitigation methods remains challenging.

The following sections of this guide are designed to clarify the current state of play for understanding the link between consumption and environmental impact:

- **The 'why' -** explores the policy context of addressing this challenge in greater detail.
- **The 'what' -** explores the challenges of linking consumption to environmental impacts.
- **The 'how' -** introduces how these challenges can be addressed.
- **The 'where next' –** considers where future work should focus to improve current understanding of impacts and soft commodity consumption to provide effective solutions.
- A **'Pathways'** section describes five possible use-cases for a combination of tools and techniques.
- The **glossary and tools and techniques section** is hyperlinked throughout the document and provides additional details on common terms and tools utilised in addressing consumption and environmental impact.

The guide seeks to help stakeholders in forming an understanding of different approaches to tackle the challenge of assessing, monitoring and acting on issues associated with international trade and environmental impacts.

The ‘why’ - trade, environmental impact and the policy agenda

The Global Outlook

Global society is consuming more resources than natural systems can sustainably supply. The global footprint network calculates that, ‘today, humanity uses the equivalent of 1.75 Earths to provide the resources we use and absorb our waste’[7]. The IPBES global assessment states that ‘three-quarters of the land-based environment and about 66% of the marine environment have been significantly altered by human actions’[8].

Global trade enables consumer access to a vast range of internationally sourced products in their local supermarkets. The land area and agricultural production systems of the UK cannot support domestic consumer demand, resulting in the need to import commodities[2]. Important export products for the UK in turn also rely on primary materials not produced domestically. Therefore, impacts associated with UK consumption and its economy increasingly occur across the planet[5].

Government and business are increasingly taking steps to understand and mitigate the impacts of their consumption beyond their own national borders or immediate suppliers. By tackling ecosystem degradation and removing risks from supply chains, we can ensure secure long-term sustainable supply.

The UK Perspective

The UK Government’s 25-year environment plan outlines ambitions to become a world leader in environmental protection. The plan presents several goals for measuring and improving the UK’s domestic environment and commits to producing an indicator which measures the environmental impact of UK consumption overseas. To produce an effective indicator, understanding the current method(s) of assessing impact of global production and trade is essential.

The actions of one country alone, such as the UK, may not lead to sweeping global improvements instantly. The importance of showing leadership in addressing impacts can set a precedent, which other countries may then choose to follow.

Towards global action

Taking steps to reduce the impact of consumption on the environment aligns with a number of the UN Sustainable Development Goals[9], summarised in Figure 1.

Figure 1 – UN Sustainable Development Goals addressed by reducing impacts of consumption on the environment

These are addressed by taking actions to mitigate impacts of trade to meet these goals:

- **2: Zero Hunger** – by maintaining an available and accessible supply of food and water
- **3: Good health and wellbeing** –by ensuring people have access to the resources they need long-term
- **6: Clean water and sanitation** – by reducing impacts of trade on water availability and quality
- **8: Decent work and economic growth** – by maintaining effective and efficient trade agreements and ensuring prosperity of supply
- **9: Industry, innovation and infrastructure** – effective solutions will involve the development and adoption of technological innovation in supply chains
- **10: Reduced inequalities** – addressing environmental issues linked to production involves addressing issues around poverty and inequality across supply chains
- **11: Sustainable cities and communities** – by addressing environmental impacts on production and the negative impacts of trade into urban areas
- **12: Responsible production and consumption** – by providing a measure of consumption impact and developing ways of making consumption more sustainable
- **13: Climate Action** – by reducing the negative impacts of production, consumption and emissions from trade on the climate
- **14: Life below water** – by reducing the negative impacts of production and consumption on the marine environment
- **15: Life on land** – by reducing the negative impacts of production and consumption on the terrestrial environment
- **17: Partnerships for the goals** – effective solutions will require and foment cross-sectorial partnerships

The Convention on Biological Diversity (CBD) Zero Draft[10] of the Post-2020 Global Biodiversity Framework proposes a target that will:

"Reform economic sectors towards sustainable practises, including their national and transnational supply chain, achieving by 2030 a reduction of [50%] in negative impact on biodiversity"

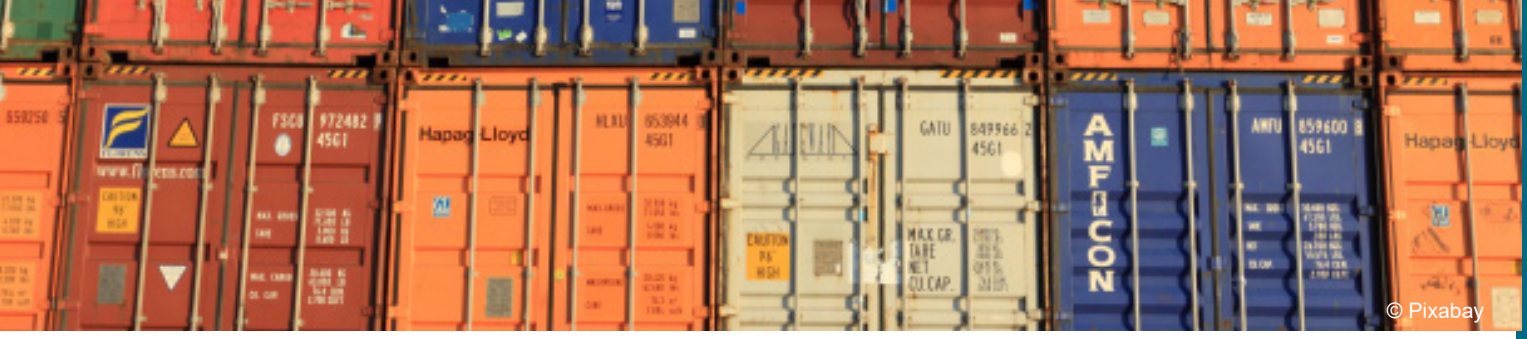
The United Nations Framework Convention on Climate Change (UNFCCC) also recognises the contribution of land use impacts and increasing demand for commodities as part of increasing the quality of life worldwide[11]. As maritime transport of goods emissions alone equate to around 2.5% of global greenhouse gas emissions annually, targeting sustainable supply chains is a priority for reducing GHG emissions and slowing climate change impacts.

NGOs have a long-standing interest in this field, particularly as environmental degradation continues, and impacts become increasingly visible. Business are also taking action to mitigate environmental impacts to protect their supply chains and demonstrate corporate- and socially-responsible activities.

The Global Resource Initiative was set up in 2018 by the UK government's Department for Environment, Farming and Rural Affairs (Defra), Department for International Development (DIFD) and Department for Business, Energy and Industrial Strategy (BEIS) in response to a commitment in the 25-year environment plan "to identify actions across supply chains that will improve the sustainability of food and forestry products and reduce deforestation". It is an independent taskforce with members from government, businesses and NGOs which was set up to investigate how the supply chains of key commodities such as palm oil, soy and beef can be fully sustainable. It set out 14 recommendations to the UK government under four themes:

- Setting out a strategic pathway
- Driving demand for sustainable commodities
- Aligning collective global action and finance
- Accelerating change and tracking progress[12]

Understanding the links between consumption and environmental impact has global significance, at a time where climate change and deforestation are top of the social, economic, political and environmental agendas.



The ‘what’ - understanding the challenges of consumption and environmental impact

The challenges associated with consumption and environmental impact of soft commodities can be broadly broken down into four elements:

1. Environmental impacts associated with global trade and consumption
2. Supply chain transparency
3. The complexities of the production landscape and achieving sustainable production
4. Agreeing a common understanding of sustainability

1. Environmental impacts associated with global trade and consumption

Global trade in agricultural products alone (excluding intra-EU flows) has more than tripled in value in the last 20 years to reach $1.33 trillion. Traditional exports such as wheat and coffee have been increasing at around 2% a year, while palm oil and processed product exports have grown much faster increasing by 8% or more annually[13]. As trade increases in volume to meet growing demands, so does complexity of supply routes which makes disaggregating the various impacts more challenging.

Many products travel significant geographic distances from the production site to the end consumer. Each stage involves a range of actors and exerts a multitude of different impacts on the environment, across multiple countries and at different scales.

Major areas of concern are explored below, and Figure 2 demonstrates how trade routes might contribute to cumulative impacts across the globe.

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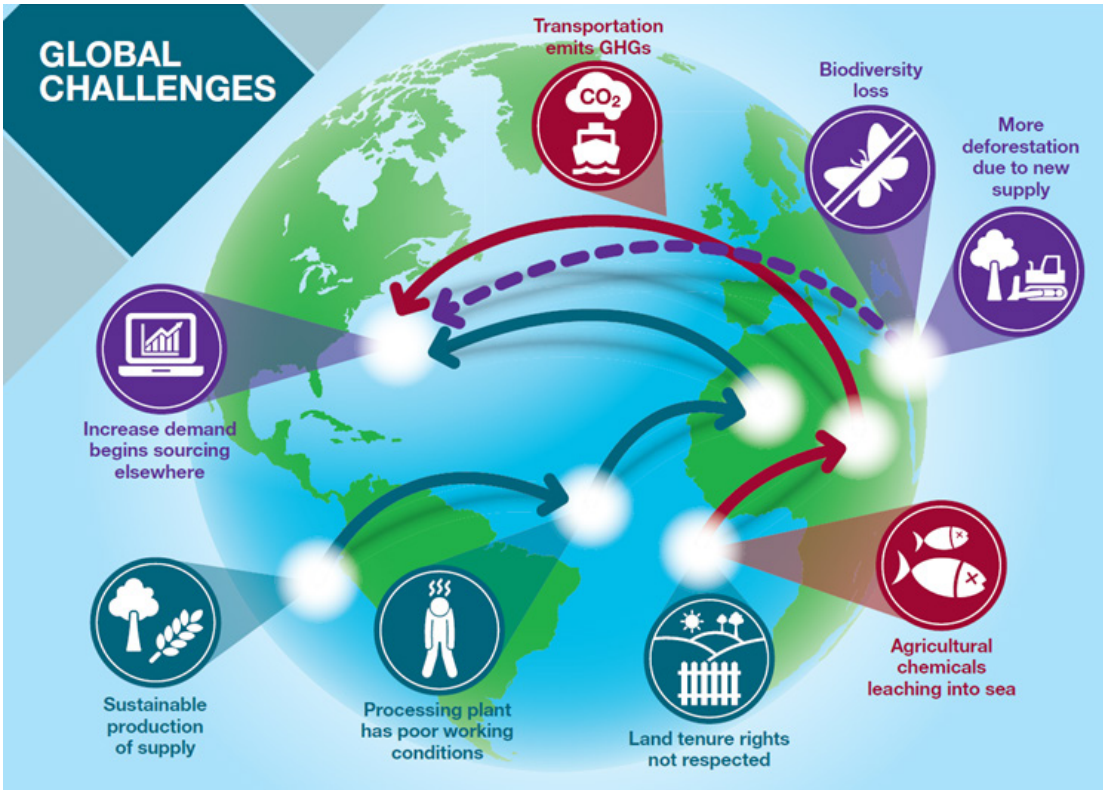


Figure 2 – Illustration of possible impacts from the movement of a soft commodity through a supply chain – from the commodity sources to the end consumer(s). Different coloured arrows represent different supply chains, white nodes represent different stages in the supply chain which have different impacts associated with them. Impacts can be numerous, diverse and dispersed across the globe. They can be social, economic or environmental. The purple dashed supply chain represents a new supply chain which is responding to growth in demand, it shows that if environmentally sustainable production (blue chain) does not fulfil demand, negative environmental impacts may occur elsewhere to meet the increase in demand.

i. Terrestrial Impacts

The common environmental impacts and dependencies of agricultural production are land conversion (including deforestation), biodiversity loss, soil loss, loss of water quality and quantity, alongside social impacts (see figures 2, 3 and 4). These threaten the long-term sustainability of production if overexploited and need to be addressed via better practices (trade flows/agreements) and by using appropriate methods to measure and address impacts. The subsequent processing and transportation of goods around the globe from production area to final consumers contributes significantly to the environmental impacts of consumption. The majority of environmental impact associated with consumption is embedded in supply chains including more than 80% of GHG emissions and more that 90% of natural capital impacts[14]. Maritime transport alone emits around 940 million tonnes of CO2 annually, equating to around 2.5% of global greenhouse gas emissions[15].

The extent of impact depends on the production process itself, the production efficiency and whether there is exploitation of local resources. In some soft commodities, variation in environmental impacts between production systems is considerable. The highest impacting practices in rice production on GHG emissions, land use, terrestrial acidification, eutrophication, and scarcity-weighted freshwater withdrawals are more than three times greater than the lowest[16].

Agricultural production to meet global market demand increasingly requires conversion of natural and semi-natural land. Soy plantations and cattle ranching are major drivers of deforestation in the Amazon and Cerrado, areas with which the UK has trading contact, for example 2.5% of soy grown in Brazil is eventually consumed in the UK[17]. The Amazon forest region represents one of the world's largest carbon sinks (90-140 billion metric tons), yet between 2001 and 2012, 1.4 million hectares were felled annually which is an area roughly the size of Northern Ireland[18]. In 2009, the Cerrado lost land cover at more than twice the rate observed in the Amazon (0.14%) in the same year losing 0.32%, mainly due to agricultural expansion for crops, such as soya bean, and pasturelands for beef production. The Cerrado has high species endemism and accommodates up to 30% of the Brazilian species richness. It is considered one of the world's hotspots of biodiversity[19].

ii. Displacement of environmental impacts

Displacement in environmental terms refers to the transfer of environmental impacts from one place to another. For example, unsustainable practice may be stopped in one area (e.g. due to a new regulation or standard), resulting in the increased unit cost of the commodity and/or reduced total yield through the newly sustainable supply, meaning more unsustainable production occurs elsewhere as a consequence, bringing with it the associated impacts in order to meet continuing demands[20]. This is sometimes called environmental leakage which refers to impacts occurring outside the production area because of improved sustainability within it[21]. For example, the protection of a coral reef from fishing might lead to more fishing in neighbouring sites. Atlantic fisheries in West Africa have experienced increased pressures as stocks in European waters have been allowed to recover[22].

Deforestation rates in the Amazon have slowed in recent years, however demand for commodities like soy have increased globally. Increasing production efficiency of soy may partially explain why deforestation in the Amazon has slowed despite this rising demand. Land may also be being deforested elsewhere, such as in the Cerrado, to compensate for reduced deforestation in the Amazon, therefore the overall rate of deforestation worldwide has not decreased[17].

iii. Marine and terrestrial interactions

Interactions between terrestrial and marine ecosystems complicate and extend the impacts of the production and movement of goods. Use of agrochemicals on crops, for example, can be transferred into coastal waters causing impacts in the marine environment[23]. These are particularly pronounced in coral reefs; most coral life stages are sensitive to the presence of insecticides associated with agricultural production[24]. Eutrophication of freshwaters and coastal marine waters is also a threat, as a result of intensive land use and livestock production[25].

Methods for assessing environmental impacts of production and trade currently do not effectively consider interactions between the terrestrial and marine environment. The diffuse nature of some impact-drivers displays complex pathways that result in impacts becoming widespread across different ecosystems, with effects operating far from the point of source. Understanding these pathways is becoming increasingly important, but this has not been explored in detail within this study.

iv. Linking social, economic and environmental impacts

There are interactions between some social, economic and environmental impacts. Newly-industrialising nations are developing new infrastructure and high-income countries increasingly outsource the material- and energy-intensive stages of production (along the supply chain) to transitioning countries in upper- and lower-middle income groups. High-income regions also import resources and materials and outsource production-related environmental impacts to middle- and low-income nations[10].

Social impacts of trade can include poor labour conditions, inequality, rights violations and health impacts arising from chemical use in production and processing of commodities. Social benefits are rarely evenly distributed. Stakeholders who invest in production may see capital gains and make financial profit, while local landowners are denied their tenure rights, often leading to resource exploitation and land degradation for the short-term gains of stakeholders[26]. Social impacts can also occur along the supply chain and are not restricted to the production landscape. For example, a processing plant further along the chain may not respect human rights[27].

While some tools for measuring environmental impacts also try to integrate social or economic context into their environmental impact assessments, integrated measures of social and environmental impacts appear to be less developed (see Box 1). A better understanding of the interplay between social, economic and environmental factors affected by global trade will help ensure greater resilience of commodity supply systems[28].

Box 1 – Number of initiatives which considered social impacts

Of the 252 initiatives we reviewed, just 73 initiatives (less than 30%) also included a social measure of impact alongside environmental impact. This shows that the integrated measurement of social and environmental impacts is less common than measurement of purely environmental impacts.

*Analysis based on time-limited review of initiatives linking trade to environmental impact for methods and data click here

2. Supply chain transparency

A comprehensive understanding of material flows through the various supply chains is required to identify where impacts are occuring, and where they are being mitigated effectively. However, achieving this understranding presents a significant challenge. Impacts can occur at different stages in the supply chain and are often diverse. Identifying key stages and processes in the correct spatial and temporal context, helps to direct efforts to manage and mitigate key impacts at critical points[29].

Supply chain complexity and transparency varies between commodities and sectors. Figure 3 illustrates the complexity that gives rise to issues with traceability.

Production systems often have direct impacts and dependencies on the ecosystem (or multiple ecosystems) at the point of origin. The resulting commodities may then be exported, processed, resold and re-exported to another country before reaching the end consumer. These latter stages often embody their own suite of impacts[14]. Furthermore, if the product is ‘embedded’ it becomes highly complex to trace the full suite of impacts from production to final consumption[29]. An example of a commodity being embedded is soy, which can be processed into animal feed, which is fed to an animal, and then subsequently processed into meat before being consumed (e.g. within the human food-chain).

To understand the full extent of environmental sustainability of a final product, the full suite of environmental costs and benefits needs to be evaluated as far as possible and reported throughout the supply chain[29]. Currently this is rarely achieved. There are a number of evolving initiatives attempting to improve the traceability of impacts within supply chains. Many of these use modelling techniques to track global trade flows, while others seek to disaggregate supply chains which are associated with individual organisations.

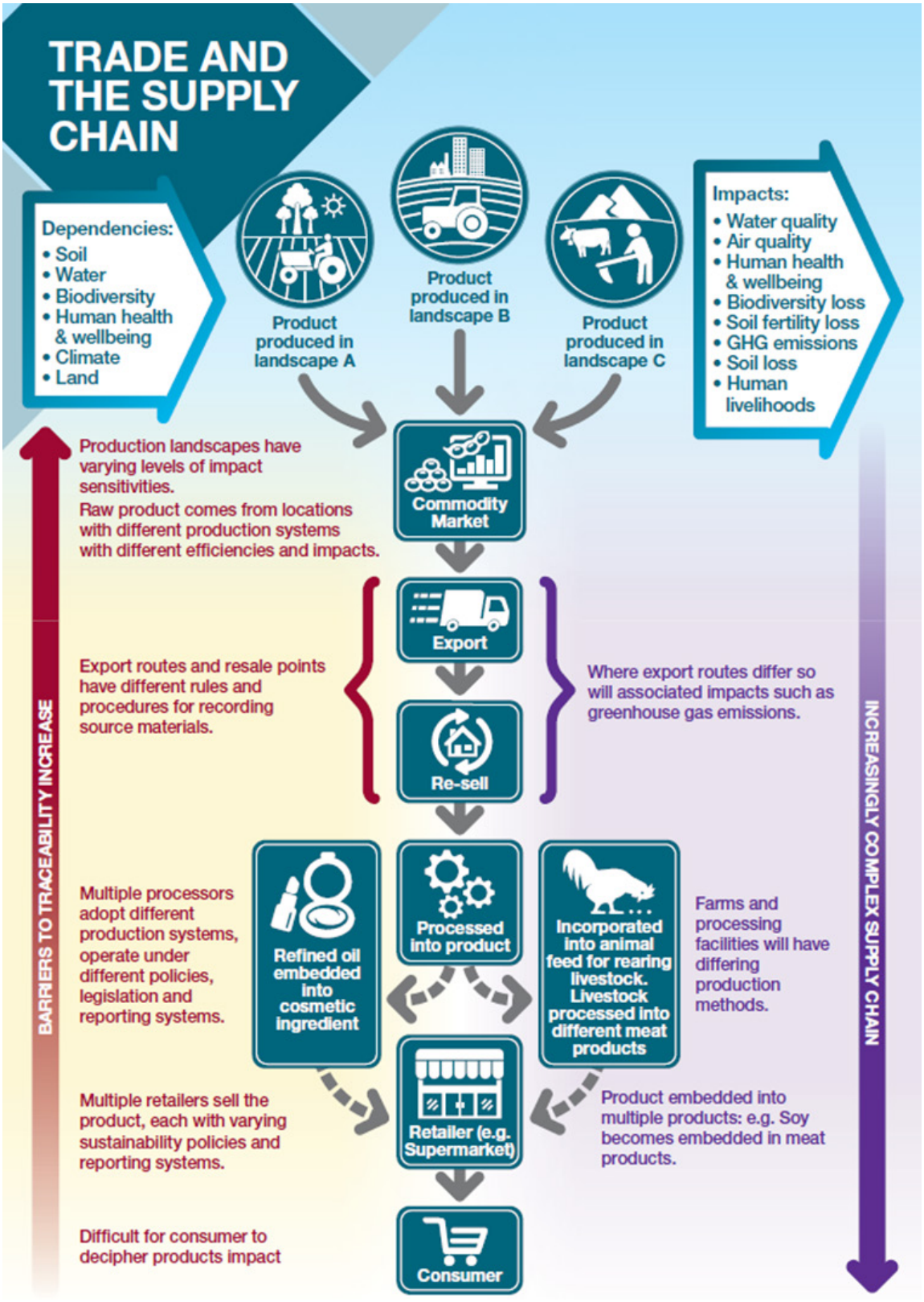


Figure 3 – Supply chain depicting areas of complexity and barriers to traceability from production to consumption

3. The complexities of the production landscape and achieving sustainable production

Complexities associated with the production area (or landscape) are depicted in Figure 4.

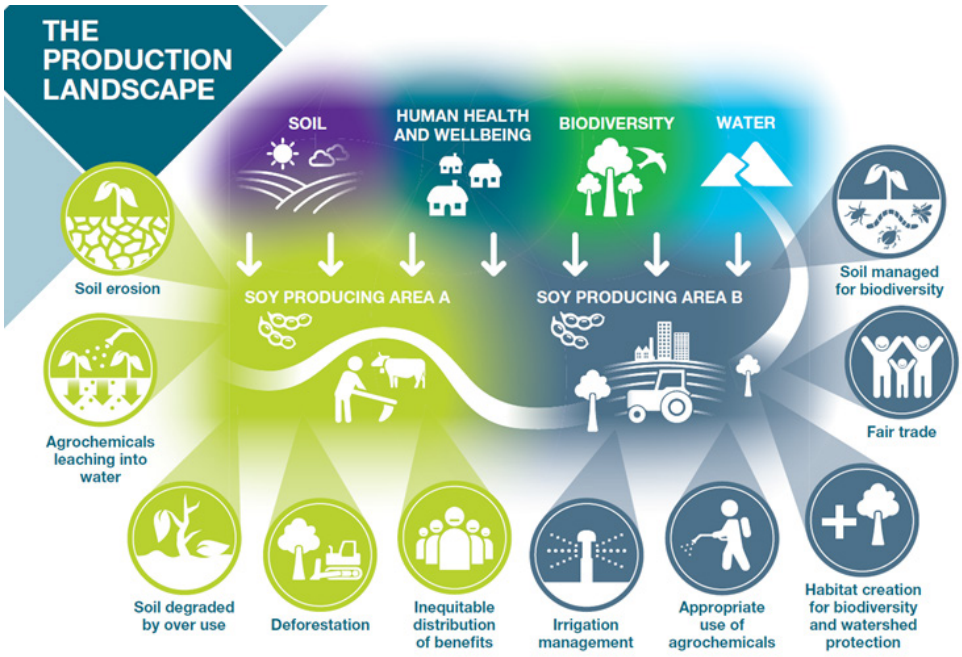


Figure 4 – An example production landscape for Soy showing dependencies (top) and possible impacts (bubbles) of production practises for two areas

There are five key complications:

i) **Operating within ecological limits:** soft commodity production has both dependencies and impacts on a landscape. Agricultural commodity production for example, depends on soil fertility and water quantity and quality. If not managed within safe ecological limits, ecosystems used for production become degraded and these natural assets become exhausted and unusable which in turn impacts future commodity production. The IPBES global assessment reports that land degradation has already reduced the productivity of 23% of the global land surface[8].

ii) **Multiple land users and practices:** a landscape can have multiple production systems and management practises operating within it. The dependencies and impacts that production has on the environment vary by commodity. Multiple commodities may be produced in one production area by different producers who use different management practises. Some of these practices may be more sustainable than others but impacts operate across the entire production area. The multi-functionality and varying objectives of different stakeholders need to be accounted for[30].

iii) **Disaggregating sustainability credentials:** commodities produced in the same region can enter the market at the same point. Sustainability credentials may vary between producers and it can be complex to attribute sustainability credentials with the right input commodity, particularly when the commodity produced by different producers is the same. Two producers in the same region may produce soy, for example, but the impacts of their activities on the land may be very different (see figure 4) one may also be certified as sustainable while the other is not. When the soy enters the supply chain, both producers' crops are combined and the 'sustainable' crop can no longer be disaggregated from the rest[30].

iv) **Sustainability operates at the landscape scale:** buyers are more likely to be more interested in the farm-scale sustainability of the one soft commodity they are buying, often ignoring the overall sustainability of the wider production landscape. The scale of supply chain models often do not match up to the landscape scale at which production impacts are measured which often focus on one commodity supply chain at a time.

v) **Defining sustainability:** the term can mean different things and different land management practices relative to how and where a commodity is produced. This is discussed in greater detail in section 4 below[31].

Recognising the diversity of production landscapes/ecosystems and the bearing this has on sustainability assessment is important in understanding the different drivers of environmental impacts. Some tools and concepts have been developed to try and address parts of these challenges, such as the integrated landscape approach and various impact assessment frameworks. These are discussed in more detail later in the 'how' section, Tools and Techniques section with use-cases described in the Pathways to Sustainability section.

4. Agreeing a common understanding of sustainability

Sustainability can mean different things in different contexts. For example, principles for sustainable management in mountainous areas will be different to those in lowland areas due to different biological and topographical factors. Sustainability may also be assessed differently depending on context. For example, the sustainability of production on recently converted land might be assessed against the levels of new habitat conversion or habitat restoration, whereas land which had been converted over a longer time period might be assessed against its production efficiency.

Throughout the supply chain, sustainability definitions may vary depending on the processes occurring at each point. In a processing plant, for example, sustainability may focus more on waste management and emissions. The context may change again when considering sustainable investment, relating to financial support provided to different actors throughout the supply chain. Table 1 illustrates the different available definitions through which sustainability can be understood in relation to consumption, trade and production. In general, sustainable practise attempts to mitigate against negative environmental and social impacts of the activity taking place.

A few initiatives exist which attempt to provide a framework within which sustainability can be understood by multiple parties, such as 'The Accountability Framework' or 'The Natural Capital Protocol'. These broad frameworks are continually evolving and are beginning to develop a common understanding of sustainability. Agreeing a common understanding of sustainability sets a benchmark against which commodity-journeys from production to consumption can be assessed.

Certification schemes develop principles and criteria which amount to sustainable production and require the entire chain of custody to comply with certification criteria in order to ensure sustainable production. However, schemes often only apply to one commodity such as timber or palm oil and criteria cannot be easily compared across schemes to assess equivalence. Organisations such as the ISEAL alliance have certification scheme members which are regarded by ISEAL as having a similar 'level' of sustainability.

Table 1 – Definitions of sustainability

Definition	Source
'Development which meets the needs of the present without compromising the ability of future generations to meet their own needs'	Our Common Future, a report by the UN World Commission on Environment and Development (the Brundtland Commission) 1987[32]
'Continuous accountability for risk and negative impacts caused by a range of actions along the supply chain'	The Chartered Institute of Procurement and Supply definition of sustainable supply chains[33]
'The sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities'	International Finance Corporation performance standard 6 *'Biodiversity Conservation and Sustainable Management of Living Natural Resources'*[34]
'Sustainable investing, also known as socially responsible investing, is the process of incorporating environmental, social and governance (ESG) factors into investment decisions'	EY., 2018. Why sustainable investing matters.[35]
'The use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions'	The United Nations definition of sustainable land management (SLM).[36]

The ‘how’ - possible approaches to reducing impacts of consumption on the environment

More than 250 tools and techniques have been reviewed to understand how they address the challenges associated with consumption and environmental impact which are discussed in the sections above[37]. The review of initiatives covers the aims of each initiative and key elements of appropriate use including:

- What type of initiative is it?
- How is it relevant to trade and environmental impact?
- How widely implemented is the initiative?
- Through which pathway does it try to drive change (impact pathway)?
- Who are the users of the initiative?
- In which sector is the initiative applied?
- What is the scope?
- Does the initiative directly measure impact?
- Which impact family does it address?

These questions were assessed. Further details of the methods applied are described in the background and methodology document.

Table 2 highlights key approaches used to address each of the challenges of consumption and environmental impact that are described in the previous section. This is not a comprehensive list but can be used to quickly navigate to the relevant glossary term for these common approaches and to a reference spreadsheet for further details. Tools and approaches listed here are not mutually exclusive and initiatives exist which have combined two or more of the approaches described. Use-cases for these tools (alongside others) are described in the pathways to sustainability section, which is designed to show the different ways tools can be implemented to achieve sustainability.

Table 2 – Key challenges of consumption and environmental impact, and approaches to help understand and reduce environmental impact

Challenges of consumption and environmental impact	Fundamental tools and approaches for understanding and reducing impact
1. Environmental impacts associated with trade and consumption	• Trade flow models – by modelling trade routes to connect consumption to production • Earth Observation technology and remote sensing – for detecting large scale environmental impacts • Global commitments and multi-lateral environmental agreements – for global collaboration on common goals • Scenario models – for modelling impacts of potential future environmental and/or supply chain changes
2. Supply chain transparency	• Trade flow models – by modelling trade routes to connect consumption to production • Due diligence approaches – which address risks • Certification schemes – an example of due diligence but also hold entire supply chain to a standard set by the scheme • Life cycle analysis – understanding the whole life cycle of a product • Supply chain risk assessments – to monitor risks in supply • Hot-spotting tools – to highlight areas at risk or of value to conservation
3. The complexities of the production landscape and achieving sustainable production	• The landscape approach – to understand the interdependencies (social, economic and environmental) of the production landscape • Community engagement and collaborative governance – to design appropriate responses • Ecosystem services approach – to understand impacts and dependencies of production • Development of condition indicators – to monitor change
4. Agreeing a common understanding of sustainability	• Sustainability frameworks – for cross-sectoral understanding of sustainability • Certification schemes – for defined sustainability standards with conformance criteria

The ‘where next’ - areas for further development

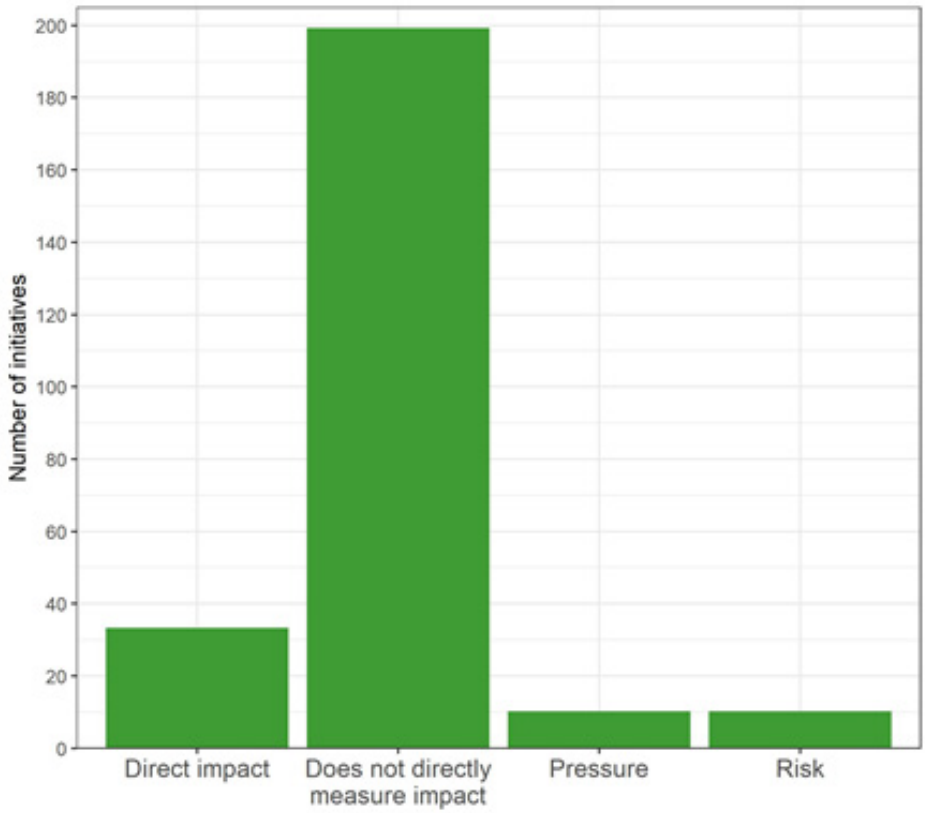
- A review of more than 250 initiatives which attempts to link consumption of goods to environmental impact has revealed some high-level trends, indicating where future solutions may lie. This work has not provided a comprehensive assessment of the effectiveness or application of potential solutions, but highlights areas where existing initiatives can be strengthened to better address the challenges discussed in this document.

- ***Traceability and delivering solutions –*** Many initiatives exist which address supply chain traceability and transparency so that impact can be identified and quantified. To help actors make changes required to reduce negative impacts, initiatives will need to evolve towards providing evidence-based advice, as to the types of mitigation measures that are expected to be taken. Mitigation methods will need to reduce existing impacts and enhance the production efficiency of current production areas without increasing impact. This would prevent further unsustainable land conversion and subsequent climate change and biodiversity impacts, and secure the resilience of commodity production[37].

- ***Integration of landscape impacts with supply chains –*** Many tools exist which model trade flows comprehensively for commodities, and incorporate information from supply chains. Few have been successful in integrating a range of landscape scale sustainability measures and communicating this up through the supply chain. The scale of supply chain models often do not match up to the scale at which production impacts occur (landscape). It is also important to assess the efficacy of assessments that can be drawn from tools which purport to link impacts to supply chains, including granularity of data and to what degree they are reflecting reality (Box 2). Tools need to integrate a range of potential environmental impacts from the point of production to final consumption and offer coordinated solutions which can be applied along the length of the supply chain to mitigate trade-offs and comprehensively report on impacts[38].

Box 2 – Direct vs indirect measures of impact

Just 33 of the 252 initiatives reviewed incorporated a direct measure of environmental impact. The vast majority did not directly measure impact while a few others used pressure or risk proxies for impact. To accurately measure and integrate environmental impacts with trade, direct environmental impacts need to be measured and reported.



*Analysis based on time-limited review of initiatives linking trade to environmental impact for methods and data click here

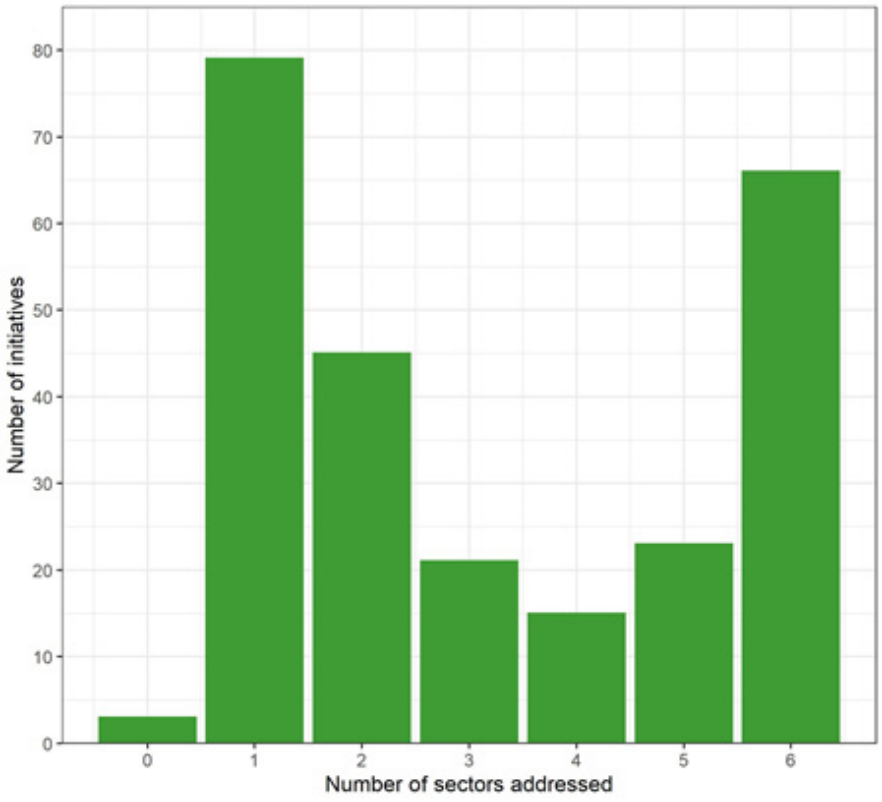
- ***Alignment*** – Currently initiatives typically address one or two sectors, although increasingly a cross-sectoral approach is encouraged (see Box 3). Increased alignment on a cross-sectoral definition of sustainability could be used to inform a baseline sustainability framework which could be used to drive required changes across all sectors[39]. This should be supported by coherent analysis of impacts and audited reporting processes. Comprehensive assessments of impacts are currently rare (Box 4). Data sources used for analysing impacts would require verification to ensure reporting based on these was a true reflection of reality. The extent to which such processes could be automated in the future also requires further exploration.

Box 3 – Number of sectors addressed by initiatives

The 252 initiatives reviewed were assigned one or more sectors if they could be applied in that sector. The sectors were:

- Agriculture
- Extractives
- Construction
- Finance
- Food
- Public

The graph below demonstrates the number of initiatives which applied to sectors. Zero means that it did not apply to any of the sectors listed above. The maximum is 6; i.e. the initiative could be applied to all the sectors listed above. The majority of initiatives addressed one or all six sectors which illustrates the disparity between initiatives that are cross-sectoral by nature and those which are sector-specific.



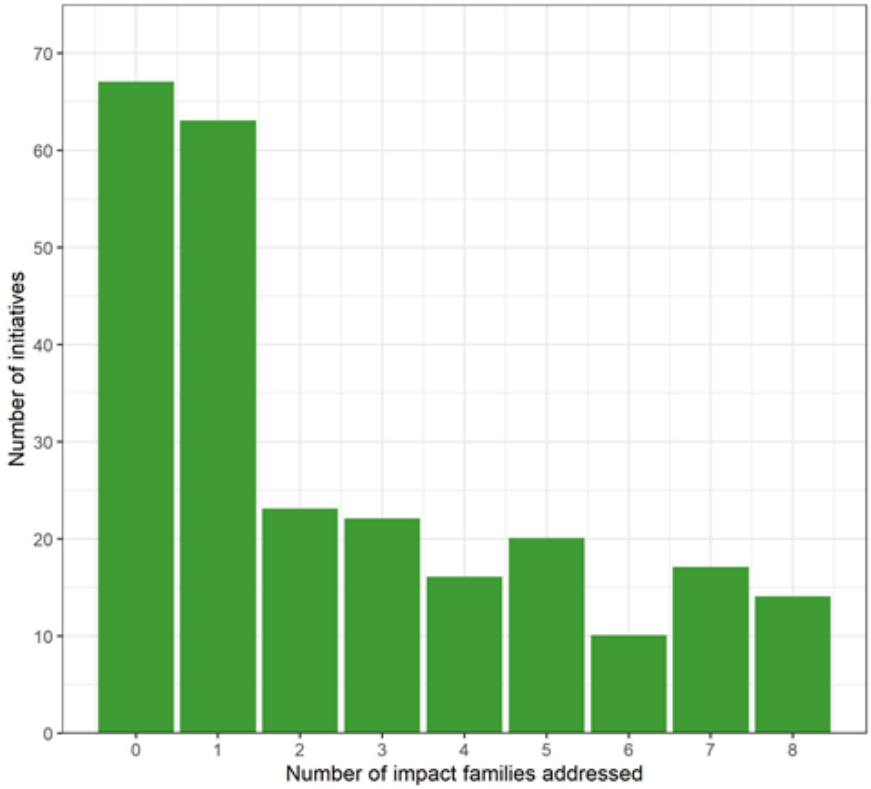
*Analysis based on time-limited review of initiatives linking trade to environmental impact for methods and data click here

Box 4 – Number of impact categories addressed by initiatives

The 252 initiatives reviewed were assigned one or more impact family if they appeared to address the impact family in question. The impact families were:

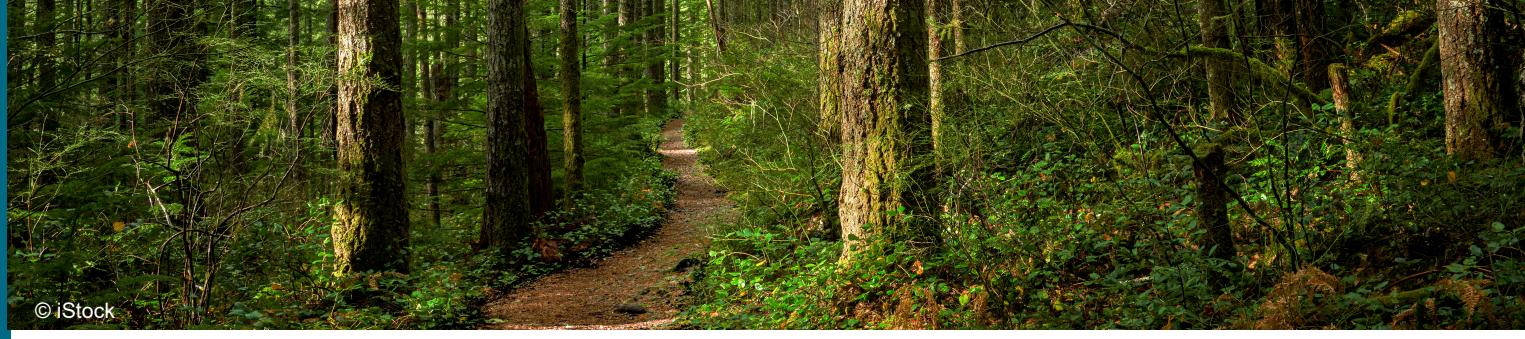
- Land Use
- Water
- Climate change
- Deforestation (specifically either alongside or instead of land use)
- Biodiversity
- Air pollution
- Soil Erosion
- Social

The graph below demonstrates the number of initiatives addressing impact families. Zero means that it did not address any of the impact families listed. The maximum is 8; i.e. the initiative addressed all of the impact families listed above. It is possible that some addressed environmental impacts that were not covered by the families listed above. The majority of initiatives, however, addressed none or one impact family. In order to improve sustainability monitoring and integrate this with supply chains, tools and techniques should consider a range of environmental impacts, however this is not currently the case for the majority of initiatives.



*Analysis based on time-limited review of initiatives linking trade to environmental impact for methods and data click here

- ***Data*** – Earth Observation technology is selectively utilised in the field and could increasingly offer a way to monitor changes in a range of impacts. Increasing accessibility and integrating a range of different data platforms would improve opportunity for long-term and comprehensive monitoring of impacts[40]. This would allow for global uses such as assessing progress against the UK Sustainable Development Goals[41].



Pathways to Sustainability

This section outlines potential approaches to improve the sustainability of global trade and soft commodity consumption. For the purposes of this study the term 'pathways to sustainability' is used to illustrate how the current state-of-play can evolve to address impacts.

The 'Pathways' conceptualise how different tools and techniques can be applied to overcome key challenges in achieving sustainability. They were highlighted in the review of more than 250 initiatives as the main mechanisms through which tools and techniques tried to effect change. The five pathways represent critical areas for consideration but should not be considered as exhaustive; they include:

- Land use and landscape management
- Raw material sourcing
- Policy, procedure and governance – public and corporate
- Financing and investing
- Consumer purchasing

Each 'pathway to sustainability' defines:

- The notion of sustainability in the context of the particular pathway
- Key factors to consider in order to achieve sustainability
- The tools that are available to help achieve sustainability objectives

The bracketed numbers (in the pathways below) that are highlighted at the end of the sentences in the '*what do I need to consider*' boxes link the reader to specific available tools that are identified in the '*Which tools and concepts would be useful to me?*' boxes. These tools are hyperlinked to further detail in the Tools and Techniques section of the guide.

Land use and landscape management

What is sustainable land management?

- The United Nations defines sustainable land management (SLM) as "the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions".
- Human activities and environmental factors (e.g. climate) combine and result in either favourable (sustainable) or unfavourable (degrading) use of natural resources.
- Natural resources can be broadly grouped into water, soil and biodiversity. They can be termed ecosystem services; i.e. the benefits humans derive from natural systems. Raw material production is supported by ecosystem services, so maintaining them within a multi-functional landscape is essential to maintain production.

What do I need to consider?

In the production landscape

- Understanding the impacts and dependencies of existing land management is essential to assessing sustainability. This provides a baseline against which progress can be measured. (1,2)
- Measuring production efficiency shows areas where efficiency can be improved. (5)

Regionally/nationally

- Assessing the wider landscape identifies impacts occurring beyond the immediate production area. Resources important to sustaining local livelihoods and biodiversity may be impacted by production activities, such as water extraction, chemical inputs, and fragmentation of habitat from land clearance. Understanding how a landscape operates as a functional unit reveals where interventions are required to reduce extended or diffuse impacts (i.e. pollution, biodiversity loss, impact on human well-being). (6)
- Consider indirect impacts among different agricultural and farming activities occurring in the same region. Landscape assessments reveal trade-offs at a more relevant scale to ensure impacts and dependencies are fully realised and mitigation action is correctly targeted. (3)

Internationally/globally

- Adopt universal indicators of impacts and data which can be interpreted by all actors to improve transparency in reporting throughout supply chains. (4,7)
- Align activities with global sustainability and environmental goals to enable different production landscapes to be compared consistently against agreed global targets.
- As global demand increases the requirement to maximise yields, reducing further land conversion will become a priority to address worldwide.

Which tools and concepts would be useful to me?

1. Farm-scale assessments and The Accountability Framework Initiative can be used to measure the state of the environment.
2. Certification schemes which set out compliance measures to improve confidence in reducing external impacts of trade. It is important to verify trademark integrity.
3. High Conservation Value areas help pinpoint areas particularly vulnerable to pressures exerted by production.
4. Blockchain use in supply chains can improve verification by actors where commodities have been sourced and signal sustainability credentials.
5. Life cycle analysis improves monitoring of production efficiency in relation to which landscape a commodity has been produced in, how it has been produced, its method of transport, and waste production and management.
6. The landscape approach encourages producers and purchasers to consider impact and supply resilience based upon factors operating beyond the production area. Involving actors for different supply chains operating in the same region will minimise negative interdependencies and maximise joint positive impact.
7. Development and use of universal indicators that monitor impacts and facilitates cross-comparisons between production sites and management techniques. Indicators should identify impacts, monitor compliance, and assess effectiveness of prescribed interventions to improve sustainability.

The bracketed numbers, highlighted at the end of the sentences in the '*What do I need to consider*' boxes, link the reader to specific available tools which are identified in the '*Which tools and concepts would be useful to me?*' boxes. These tools are hyperlinked to further detail in the Tools and Techniques section of the guide.

Raw material sourcing

What is sustainable raw material sourcing?

The sustainable sourcing of raw materials is defined by the UN Environment Programme's principles of sustainable consumption and production:

- Improving the quality of life without increasing environmental degradation and without compromising the resource needs of future generations.
- Decoupling economic growth from environmental degradation by:
  - Reducing material/energy intensity of economic activities and reducing emissions and waste from extraction, production, consumption and disposal.
  - Promoting a shift of consumption patterns towards lower use of energy and materials without compromising quality of life.
- Applying lifecycle thinking which considers the impacts of all phases of production and consumption.
- Guarding against the 're-bound effect', where efficiency gains are cancelled out by increases in consumption (UNEP 2011).

What do I need to consider?

In the production landscape

- Gather data, model baseline conditions and develop indicators to track impact. (2)
- Monitor potential impacts of changes made and mitigate against negative impacts. (3)
- Maintain the resilience of natural systems where commodity production takes place. (5)

Regionally/nationally

- Integrate reporting on environmental conditions along the supply chain.
- Supply chain transparency is essential to trace raw material sourcing. It enables tracking of material from source to final consumption. Tracking helps identify risks to supply continuity, opportunities for increased efficiency and impacts to manage. (1,8)
- Country-wide analyses need to rely on production data, trade flow models, and emerging technologies such as Artificial Intelligence and Earth Observation data to respond to environmental change and impacts. (4)
- Risk-profiling commodity production and trade. (2,6,7)

Internationally/globally

- Displacement is where unsustainable production is shifted to another locality in response to demands from consumers and purchasers. New policies and initiatives should address risk of leakage between regions and actors of different supply chains/commodities from a trans-regional perspective. (2,3)
- Aligning trade with global commitments, setting company targets and cross-sectoral collaboration to achieve unified response to impact mitigation. (6)

Which tools and concepts would be useful to me?

1. Blockchain use can verify where commodities have been sourced and signal sustainability credentials.
2. Trade flow models, using environmental extensions, integrate environmental quality indicators, enabling users to assess risks associated with material source regions. Supply chains with fewer links are relatively simplistic to assess, but for processed and embedded materials the risk assessment can only be conducted at the sector level.
3. Scenario models project different conditions which can be used to assess impacts and commercial risks.
4. Artificial intelligence expedites analysis of Earth Observation, which can support rapid and wide-spread environmental impact analyses.
5. The landscape approach encourages producers and purchasers to consider impact and supply resilience based upon factors operating beyond the production area to minimise negative interdependencies and maximise positive impact.
6. Corporate social responsibility reports, or Environment and Social governance report, on the commitment and impacts an organisation's operations have on society and the environment.
7. Life cycle analysis monitors production efficiency in relation to which landscape a commodity has been produced in, how it has been produced, its method of transport, and waste production and management.
8. Certification schemes provide criteria which set out measures that should be complied with to improve confidence in reducing external impacts of trade. It is important to verify trademark integrity.

The bracketed numbers, highlighted at the end of the sentences in the '*What do I need to consider*' boxes, link the reader to specific available tools which are identified in the '*Which tools and concepts would be useful to me?*' boxes. These tools are hyperlinked to further detail in the Tools and Techniques section of the guide.

Policy, procedure and governance – public and corporate

How can policy drive sustainable production?

Policy can act as a regulation mechanism to change business and public sector behaviour to manage environmental impacts. Sustainable development is often defined as 'maximisation of human well-being for today's generations [whilst] not leading to declines in future well-being' (OECD 2001). A sustainable policy framework might involve:

- Shifting financial investments away from environmentally destructive activities.
- Considering national commodity purchasing (e.g. reducing consumption of certain more impactful materials or products) and incentivising sustainable purchasing patterns.
- Shaping global production systems in line with high environmental standards.
- Supporting nations to transform production systems and develop sustainable livelihoods.
- Calling for accountable reporting processes that evidence management and avoidance of environmental impacts.

What do I need to consider?

In the production landscape

- Ecosystem-based and landscape approaches assess how multiple impacts may be operating spatially and temporally. (6,3)
- Using frameworks for sustainability can support coherent regulatory policy development across sectors. (1)

Regionally/nationally

- Life cycle analysis to inform public and private investment away from destructive industrial practice and identify areas requiring policy support. (5)
- Monitoring and reporting of impacts should make use of comprehensive frameworks, modelling and evidence. (1,3,2)

Internationally/globally

- Assessment of current trends in global change can direct policy effort. (2,4)
- Adopting universal indicators of impacts and common data standards improves transparency in reporting throughout supply chains. International alignment on these would set a benchmark for sustainability (1, 8)
- International cooperation to enhance the positive impacts of interventions. (7,9)
- Regulatory policy is needed for financial investments which addresses environmental risks and prevents unsustainable practises from receiving investments.

Which tools and concepts would be useful to me?

1. Frameworks and protocols, such as the Natural Capital Protocol or the Accountability Framework Initiative provide accounting structures to address all elements of sustainability.
2. Remote sensing and Earth Observation can illustrate impacts. Global Forest Watch, for example, uses satellite imagery to assess loss of tree cover.
3. Scenario models and policy testbeds simulate impact and outcomes of condition changes. Hot-spotting tools highlight priority areas for action.
4. Trade flow models use economic techniques to estimate global trade flows, linking commodity production to final consumption
5. Life cycle analysis improves monitoring of production efficiency in relation to which landscape a commodity has been produced in, how it has been produced, method of transport, waste production and management.
6. The landscape approach encourages producers and purchasers to consider impact and supply resilience based upon factors operating beyond the production area. Involving actors for different supply chains operating in the same region will minimise negative interdependencies and maximise joint positive impact.
7. Multilateral Environmental Agreements commitments should be considered when implementing changes, those addressing MEA targets have global relevance and are likely to complement international action and achieve greater levels of cooperation and impact.
8. Development and use of universal indicators that monitor impacts and facilitate cross comparisons between production sites and effectiveness of management techniques. Indicators should identify impacts, monitor compliance, and assess effectiveness of prescribed interventions to improve sustainability.
9. The Amsterdam Declaration provides a platform through which countries can collaborate to deliver collective deforestation commitments, avoiding duplication of effort.

The bracketed numbers, highlighted at the end of the sentences in the '*What do I need to consider*' boxes, link the reader to specific available tools which are identified in the '*Which tools and concepts would be useful to me?*' boxes. These tools are hyperlinked to further detail in the Tools and Techniques section of the guide.

Financing and investing

What is sustainable financing and investing?

- Securing finance and investment are important drivers for many businesses. Short-term financial gains, obtained at the expense of the environment, can increase profits but increase long-term risk exposure by degrading business critical natural capital assets.
- Sustainable, responsible and impact investment approaches should consider environmental, social and corporate governance criteria to generate long-term financial returns and positive environmental and societal impacts.
- Understanding environmental and social factors in relation to investments ensures risks are identified, managed and improves the long-term viability of financial returns.
- Commercial banks and investors have diffuse roles in finance. While investors purchase stocks and shares for companies, commercial banks work primarily on issuing loans or processing deposits for companies or individuals, thus their considerations around ensuring sustainability may differ.

What do I need to consider?

In the production landscape

- Environmental risk assessment determines whether an investment is viable, and benefits will be returned. (2,3,6)
- Risk assessing environmental impacts can also highlight mutual gains for investment, production and the environment. (3,6)

Regionally/nationally

- Corporations and financial institutions account for environmental risks and impacts in their strategies, operations and investment portfolios (5)
- Independent initiatives provide a verifiable and competitive basis to rank financial centres' sustainability criteria against each other. (1,8)
- Initiatives to track and benchmark progress to evidence activities on environmental and social governance. (1,2,3,8)

Internationally/globally

- Financial institutions are developing new financial mechanisms such as green bonds, sustainable stocks and shares pots and impact investing. (1,4,8)
- Cross-sectoral collaboration ensures that investments have downstream sustainability impacts on land management and trade flows. (5,7)
- Regulating policy is needed for financial investments/loans which addresses environmental risks and prevents unsustainable practises from receiving investments/loans.
- Sustainability-linked loans offered by banks offer a reduction on the capital interest when certain sustainability-related KPIs are met and penalise with more expensive capital interests if the agreed progress has not been reached.

Which tools and concepts would be useful to me?

1. Independent initiatives rank financial institutions against each other. Corporate Social Responsibility reporting is used to compare progress.
2. The Equator principles provide a framework for assessing sustainability risks associated with investments and defining financial sustainability.
3. Environmental foot-printing assesses impacts of trade activities on the environment.
4. Financial services which integrate environmental, social and governance (ESG) criteria into investment decisions are called sustainability investments.
5. The Frankfurt Declaration signed by major stakeholders in the German Banking (Deutsche Börse) Group, demonstrating intention for sustainable finance in the German financial centre. Signatories fully encourage the support of positive economic and social development founded on protection of the natural basis of life.
6. Earth Observation can be used to link environmental risks to investment areas.
7. Multilateral environmental agreement requirements should be addressed in financial decisions so impacts address major environmental challenges at a global scale.
8. Benchmarking the 'greenness' of financial centres (I4CE), measures and quantifies the contribution of the main financial centres financing for climate and environment solutions.
9. Trade flow models use economic techniques to estimate global trade flows, linking commodity production to final consumption. They can help identify higher risk aspects of financial portfolios.

The bracketed numbers, highlighted at the end of the sentences in the '*What do I need to consider*' boxes, link the reader to specific available tools which are identified in the '*Which tools and concepts would be useful to me?*' boxes. These tools are hyperlinked to further detail in the Tools and Techniques section of the guide.

Consumer purchasing

What do consumers understand to be sustainable purchasing?

- Sustainable purchasing refers to the act of selecting and purchasing products based upon the level of harm caused to the environment.
- Understanding of factors governing sustainability varies greatly amongst consumers. The information detailed on products helps to relay sustainability credentials, such as recyclability of packaging and fair trade, to the consumer audience.

What do I need to consider?

In the production landscape

- Sustainability branding is used to advertise the sustainable nature of a product. Certification schemes use labelling systems to raise their profile amongst consumers. (1,2)

Regionally/nationally

- If consumers engage with sustainable purchasing and drive overall purchasing patterns, this can drive larger scale behavioural change throughout the supply chain and deliver economic returns for sustainable production and consumption.
- The development and broad adoption of mobile apps that inform end consumers about the origin of the products they buy, as well as the environmental risks associated to a specific product, helps encourage more sustainable consumption.
- 'Sustainably-minded' consumers are likely to engage with accessible mechanisms for assessing supply chain transparency or foot-printing tools. (4)
- Businesses report sustainability actions in corporate social responsibility reports. (3)
- Corporate social innovation departments are also increasingly appearing in businesses. They aim to increase shared values between business and society.

Internationally/globally

- Consumer engagement with sustainable purchasing is dependent on their awareness and understanding of sustainability issues.
- Consumer behaviour is influenced by a range of social factors such as social influence, habituation and 'the domino effect' which is a term used to describe how one sustainable purchasing action will motivate another in favour of consistency. (5)
- Certification schemes engage consumers in more sustainable purchasing patterns using a range of communication mechanisms which inform the audience.

Which tools and concepts would be useful to me?

1. Certification schemes provide criteria which set out compliance measures that can improve consumer confidence in reducing external impacts of trade. It is important to verify trademark integrity.
2. Trademarks exclusively identify a product as belonging to a specific organisation and recognises the organisation's ownership of the brand.
3. Corporate social responsibility reports, or ESG, are used to report on the commitment and impacts an organisation's operations have on the environment and society.
4. Environmental foot-printing is used to assess impacts of trade activities on the environment. The magnitude of impact that a commodity has along its supply chain and on its source environment is measured to provide an assessment of sustainability.
5. Driving consumer behaviour from a business perspective*

*https://hbr.org/2019/07/the-elusive-green-consumer

The bracketed numbers, highlighted at the end of the sentences in the '*What do I need to consider*' boxes, link the reader to specific available tools which are identified in the '*Which tools and concepts would be useful to me?*' boxes. These tools are hyperlinked to further detail in the Tools and Techniques section of the guide.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Glossary of terms

The 25 Year Environment Plan

The 25 Year Environment Plan sets out the UK government action to help the natural world, across the UK and internationally, to regain and retain good health. It aims to deliver cleaner air and water in cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first. An indicator framework is being developed to support the planned implementation and track progress against its objectives.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

The Global Resource Initiative (GRI) was formed in response the commitment the government made in the 25 Year Environment Plan to leave a lighter footprint on the global environment. The taskforce is a combination of government, businesses and NGOs and aims to 'to drive more resilient and sustainable food systems that avoid deforestation and environmental degradation overseas, while supporting jobs and livelihoods'[42].

The Amsterdam Declarations

The Amsterdam Declarations are "non-legally binding political commitments that aim to support the implementation of private sector commitments on deforestation and sustainable palm oil".[43] They aim to incentivise improved sustainability practices in producer countries by increasing the market demand for sustainable produce in the consuming countries within the agreement. There are two Declarations: one aims to prevent deforestation and the other focuses on sourcing sustainable palm oil. Both came into place in December 2015, with a target date of achieving the identified goals by 2020. The signatories of the agreement are Denmark, Germany, Netherlands, Norway, the United Kingdom, Italy and France. Together these countries make up a significant proportion of market share of deforestation-risk commodities. It was hoped that the Declarations would stimulate private sector commitments around their deforestation risk commodities (such as palm oil, soy and cocoa).

The declarations have resulted in the creation of supporting initiatives which aim to help countries and organisations meet their commitments to the declarations:

- The Amsterdam declarations partnerships cooperates all the signatory partners
- Mekon Ecology provides the support unit / secretariat for coordinating and facilitating the implementation of the Amsterdam Declarations Partnership on deforestation-free, sustainable commodities

Return to policy, procedure and governance pathway

Chain of custody

A chain of custody is the documentation that records the chronological sequence of ownership and analysis of a physical or electronic entity. In the context of trade and material sourcing, the ISEAL Alliance define a chain of custody as '*a set of requirements and measures that provide the necessary controls on the movement of material or products, and associated sustainability data, from approved or certified businesses through each stage of the supply chain.*'[44] A chain of custody therefore records all organisations within a supply chain that are responsible for a product during production, processing, transport and sale.

Return to agreeing a common understanding of sustainability

Commodities

A mineral or primary agricultural product that can be purchased and traded. Commodities are typically homogenous, with little variation across producers. This means they are largely regarded as substitutable and of equal economic value irrespective of the source. However, there are often large differences between different sources in terms of production and processing practices and thus the environmental impact that they cause. In many cases, commodities are used as raw materials (i.e. an input or ingredient) for a more complex final product. For example, palm oil as a commodity can be incorporated into chocolate, cosmetics, margarine and many other products. Examples of commodities include soy, palm oil, sugar, gold, coffee beans and copper.

The term ***soft commodities*** refers to commodities which are grown (via agricultural production or forestry) instead of mined, this classification includes materials such as cotton, cocoa, soy, coffee and livestock which are grown and harvested. In contrast ***hard commodities*** refer to mined metals (copper, gold, silver, etc.) and energy extraction (crude oil, natural gas and products refined from them)[45].

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Return to Introduction
Return to the 'what' – challenges of consumption and environmental impact
Return to Pathways to Sustainability

Corporate Social Responsibility (CSR) reports

CSR reports to investors, employees, consumers and the public are used by companies to communicate the corporate actions they are taking to improve their social and environmental impacts[46]. This normally takes place on a voluntary basis, with the aim of improving reputation and accountability.

Increasingly, businesses are developing additional Corporate Social Innovation (CSI) departments which look to increase shared values between the business and society. They are moving beyond reporting to address sustainability challenges as part of their business activities[47].

Return to raw material sourcing pathway
Return to financing and investing pathway
Return to consumer purchasing pathway

Cross-sectoral collaborations

'Cross-sectoral' relates to circumstances affecting more than one economic or social group. For example, a cross-sectoral group might include public, private and social sectors. When these groups work together towards common societal objectives, it can be described as cross-sectoral collaboration[48]. This way of working is increasingly favoured in environmental projects to encourage systematic change in societal behaviour to protect the environment. It is also a way of highlighting the different and overlapping dependencies that all sectors have on the environment and bringing actors together to ensure the sustainability of their actions.

Return to Table 2
Return to raw material sourcing pathway

Displacement

Displacement in general terms considers the act of moving something from its place. In the context of sustainability, it is a key concern and occurs in cases where unsustainable production is diverted to other geographic areas, times, actors or commodities. In some cases, it may be that unsustainable practice is stopped in one area (due to a new regulation or standard) but as a consequence of increased unit cost of the commodity and/or reduced total yield though the newly sustainable supply, more unsustainable production now occurs elsewhere; thus the problem of unsustainable production is simply shifted elsewhere[49].

Return to displacement of environmental impacts
Return to raw material sourcing pathway

Due Diligence

Due Diligence relates to investigating causes of concern before entering into an agreement. In sustainability, it often involves review of the environmental, social and legal risks that may result from entering into an agreement or contract with a trading partner. Due Diligence approaches focus on identifying and measuring the environmental and social risks associated with a prospective purchase, and may also involve identifying ways in which these risks could be reduced[50]. The detail and assessment process for due diligence can vary by transaction, industry, cost and perceived risk. Due Diligence may refer to a legal obligation, but more commonly refers to voluntary investigations in order to avoid reputational risk.

Return to Table 2

Environmental, Social and Governance (ESG) reports

ESG refers to the ways in which corporations consider the environment (for example climate change and biodiversity), social issues (such as labour practices and data security) and governance (for example management structure and diversity) in their operations. They are often used to communicate these factors to investors, who may be interested in considering them before adding the company to their portfolios (e.g., stocks, bonds, real estate). In contrast to CSR, which focusses on corporate actions, ESG looks more widely at all of the organisation's activities.

Return to raw material sourcing pathway
Return to consumer purchasing pathway

The Equator Principles

These principles provide a structure around which a financial institution can assess sustainability risks associated with investments and a benchmark/standard against which an investment can be assessed as 'sustainable'. The Equator Principles (EPs) website explains that they are a "*risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making*."

Financial institutions can commit to implementing the EPs within their internal policies and become 'Equator Principles Financial Institutions'. They also will not provide financial support to companies who do not comply with the EPs. The EPs apply primarily to four financial products:

1. Project Finance Advisory Services
2. Project Finance
3. Project-Related Corporate Loans
4. Bridge Loans

Further information is available at: https://equator-principles.com/about/

Return to financing and investing pathway

The Frankfurt Declaration

The Frankfurt Declaration is a voluntary commitment from members of the Frankfurt financial centre, alongside environmental organisations and NGOs with common goals around long term sustainability in finance. These are:

- "to define the framework conditions of sustainable finance and to put in place concrete initiatives to implement new structures.
- to identify measures, products and services with a view to mobilising the potential of sustainable financial market infrastructures and using it to initiate positive economic, social and environmental development.
- to identify the Frankfurt financial centre's responsibility in achieving the UN Sustainable Development Goals and to define key indicators allowing the financial services sector to measure its contributions to achieving the sustainable development goals.
- to align corporate governance with the principles of the UN Global Compact, the contents of the UNEP Statement of Commitment by Financial Institutions on Sustainable Development and/or the PRI Principles for Responsible Investment and to annually report on its progress in the respective format."[51]

The declaration is an example of a local commitment by several financial players to developing consensus on sustainability in finance.

Return to financing and investing pathway

Global Forest Watch

Global Forest Watch (GFW) is an online data visualisation platform, aiming to communicate geospatial information about forests and deforestation at a global scale. Novel technologies such as satellite data and cloud computing allow for the provision of near-real time data. There is also a 'pro' version of the tool which is accessible for a fee, which is aimed at companies and financial institutions. It has additional functions such as monitoring conditions at farms, supply storage or jurisdictions, and tracking changes over time. It supports companies in demonstrating compliance with commitments and policies and allows for data sharing through secure workflows.

Further reading: https://www.globalforestwatch.org/

Return to policy, procedure and governance pathway

High Conservation Value approach

This is a framework (of a member-based organisation) for identifying and designating areas of 'High Conservation Value' (HCVs). HCVs are '*biological, ecological, social or cultural values of outstanding significance at the national, regional or global level or of critical importance at the local level*'. There are six types of HCVs:

- Species diversity
- Landscape level ecosystems
- Ecosystems and habitats
- Ecosystem services
- Community needs
- Cultural values

HCV has a 3-step approach – assessment, management and monitoring. HCV assessments involve field studies and stakeholder consultation and are a prerequisite to several agricultural certification schemes amongst other forms of due diligence reporting.

Further reading: https://hcvnetwork.org/

Return to land use and landscape management pathway

Indicators

In environmental science, indicators represent any metric which informs us of the condition of the environment. An ecological and environmental indicator can act as a proxy for environmental health, which is often complex and difficult to measure directly.

Indicators contribute to evaluation of policy development by:

- Providing decision-makers and the general public with relevant information on the current state and trends in the environment.
- Helping decision-makers better understand cause and effect relationships between the choices and practices of businesses and policymakers versus the environment.
- Assisting to monitor and assess the effectiveness of measures taken to increase and enhance ecological goods and services.

As part of the work underpinning the LET Guide, an additional review was undertaken to gain understanding of the range of pressure-biodiversity models available. It aimed to draw conclusions on the most appropriate direction to take if indicator development were to prioritise the use of biodiversity as a metric, more information can be found here.

Return to Table 2
Return to land use and landscape management pathway
Return to raw material sourcing pathway
Return to policy, procedure and governance pathway

ISEAL Alliance

ISEAL is a global membership organisation for credible sustainability standards. Certification schemes and sustainability standards are eligible for membership if they comply with ISEAL's Codes of Good Practice and '*promote measurable change through open, rigorous and accessible certification systems*'. It attempts to provide a baseline for sustainability certification through its code of good practice – anyone certified by ISEAL's members automatically abides by these Codes of Good Practice, thus providing a common definition.

Further information: https://www.isealalliance.org/about-iseal/who-we-are

Return to agreeing a common understanding of sustainability

Multi-lateral environmental agreements

Multilateral Environmental Agreements (MEA) are international agreements, between three or more countries (agreements between two countries are referred to as "bilateral agreements") on how to jointly address environmental issues of a cross-border nature. Due to their cross-border nature, these kind of environmental issues often require action in several countries, and MEAs provide the rules for what each country is required to do to address the issues. The most widely-recognised MEAs are those which address global problems, affecting more or less all countries in the world such as the United Nations Sustainable Development Goals. Among these are the United Nations Framework Convention on Climate Change (UNFCCC) with its associated Kyoto Protocol, the UN Convention on Biological Diversity (CBD), the Stockholm Convention on Persistent Organic Pollutants (concerning the elimination of persistent organic pollutants), and the Basel Convention (on the control of movements of hazardous wastes and their disposal between nations).

Return to Table 2
Return to policy, procedure and governance pathway
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Production efficiency

Production efficiency refers to an optimisation of the inputs to a production system in order to get the maximum outputs for the minimum cost. It is most commonly used in economics and refers to a direct monetary cost. However, the concept can also be applied to the field of sustainability if attempting to minimise an environmental 'cost' per unit of output. For example, land use is a significant driver of carbon and biodiversity loss. A farm or plantation that produced the same amount as another farm, but using a smaller land area to do so, would be considered to have greater production efficiency in terms of land use. Ideally, the concept would be applied across multiple environmental impacts to avoid trade-offs (i.e. even if an entity may be using less land, is that entity also using more polluting fertiliser and pesticides to achieve this?), although the relative impacts of different environmental pressures are difficult to asses.

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Raw material

A raw material is a primary, unprocessed material in its natural state that is used as an input or ingredient for a more complex final or intermediate product through a manufacturing process. For example, wheat is a raw material from which it is possible to make flour. Raw materials can refer to both agricultural products (such as meat, wood and grain) and to mineral resources (such as crude oil and metal ore).

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Resilience

There are multiple definitions of resilience in use and the concept also has slightly different uses and interpretations by different communities. A paper by Brand, F. S., and K. Jax published in 2007[52] discusses the various possible interpretations of resilience from the normative definition of 'flexibility over the long term' through to ecological resilience and hybrid interpretations which consider socio-ecological cross overs.

The British Ecological Society determined during a workshop in 2015, that despite the various available definitions, resilience essentially encompasses three related elements[53]:

- "Resistance – the ability of a system to remain essentially unaltered after disturbance.
- Recovery – the ability of a system to return to the previous state after disturbance.
- Persistence – the ability of a system to maintain a state over time, which depends on both resistance and recovery."

These three elements may be crucial to avoiding ecosystem collapse, which when sourcing raw materials from an ecosystem is imperative to ensuring that supply of goods is maintained.

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Sustainability branding

Sustainability branding is where products are branded with explicit mention of their environmental credentials or values as part of the brand 'essence'[54]. Increasingly, sustainability branding also addresses social and economic sustainability alongside environmental[55]. Sustainability branding is increasingly used as a marketing tool which helps to advertise an organisation's effort to be sustainable to consumers. Users of sustainability branding must be careful not to 'greenwash'. Greenwashing occurs when claims of sustainability are not backed up with evidence and is a form of false advertising to consumers.

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Traceability system

The system used to record information about a product and its components, from the point of initial production to the point of final consumption. The term generally, but not exclusively, refers to an online tracking system[56].

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Trademarks

These are registered markings which uniquely identify a product as being owned by a specific organisation[57]. For example, certification schemes often have trademarked product labels which enable them to monitor and take legal action against misuse of the label. This helps to protect the integrity of the certification scheme's label and ensure products are genuinely certified.

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Transparency

In general terms, transparency refers to the extent to which information has been made apparent and accessible. In the context of supply chains, it refers to the ability to find out about a product's history, origin and path through the supply chain, including information on the environmental impacts that have taken place along the way.

A paper by Gardner *et al.* published in 2019[58] explored the various opportunities and challenges afforded by enhanced supply chain transparency:

- It can stimulate change in the sustainability production systems, as different actors within the supply chain become better informed and more able to identify and reduce their associated environmental risk.
- There are many limitations associated with collection and dissemination of data.
- It is possible for improvements in transparency to lead to perverse outcomes such as further increasing inequalities, depending on how the data made available is used.

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Tools and Techniques

Artificial intelligence (AI)

This refers to "a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation".[59] AI has great potential in terms of obtaining a detailed understanding of Earth Observation, specifically supporting climate change and other global environmental impacts. Its capacity could, in future, help to model land use change and process satellite data. Although its use in measuring environmental impacts of trade are still embryonic, it has great potential for the future and is the focus of much innovation.

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Blockchain

Blockchain can be described as a data structure that holds transactional records while ensuring security, transparency, and decentralisation. It is a chain of records stored in the form of blocks which are controlled by no single authority. The use of blockchain in trade is not yet widely implemented. In theory by uploading data to the 'chain' in 'blocks', which represent different sections of the supply chain, data can be accessed and verified by actors all along it, thus increasing transparency. A couple of projects are pioneering the use of blockchain for supply chain sustainability:

- Halotrade
- IBM (Blockchain and supply chain research)

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Certification schemes

Certification schemes are often voluntary initiatives that audit producers, traders, exporting companies and importing companies against a defined set of standards and criteria, allowing any produce that complies to be sold with a certified status. Whilst different schemes have varying focus, from food safety to human rights, certain schemes have a strong environmental component with the aim of guaranteeing that the produce they certify has come from a sustainably managed source; namely that minimal environmental impact has occurred during the production process. Most environmentally focused schemes certify producers, although some schemes also implement chain-of-custody certification, which is awarded to traders of certified goods. Examples of some well-known environmentally focused schemes include:

- FSC (Forest Stewardship Council)
- PEFC (Program for Endorsement of Forest Certification)
- RSPO (Roundtable on Sustainable Palm Oil)
- RTRS (Round Table on Responsible Soy)
- Rainforest Alliance

Some businesses are moving from this kind of third-party certification to their own standard which they audit against such as Cargill's Triple S (Sustainably Sourced and Supplied) standard[60] which they require suppliers to meet.

Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.

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Earth Observation and remote sensing

Remote sensing is a broad term used to cover any technique that gathers information about something without physical contact. Examples include taking a photograph and measuring the frequency of a radio wave.

Earth Observation involves the use of remote sensing to capture information about planet Earth. This may be in relation to any of its biological, chemical or physical properties. The most common examples are the use of satellite imagery and drone imagery, but it can also be used to refer to measurements taken from ground- or ocean-based instruments, such as ocean buoys and wind gauges.

The use of satellite images in particular is becoming increasingly important to the field of sustainable production and consumption, through their use in the mapping of land use change, such as deforestation – much of which is caused by unsustainable commodity production. Near real-time data on deforestation rates and locations provides an evidence base for action to address this, particularly in cases of illegal deforestation.

Examples of initiatives utilising Earth Observation and remote sensing include:

- Starling verification
- Amazon Soy Moratorium
- Cocoa & Forests Initiative
- Earth Time
- Global Forest Watch
- Global Forest Watch Pro
- High Carbon Stock Approach (HCSA)
- Satelligence

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Ecosystem services

Ecosystem services are the direct and indirect effects that ecosystems have on the well-being of humans (TEEB, 2010), including both tangible and intangible factors.[61]

The Common International Classification of Ecosystem Services (CICES) is a hierarchically organised system for classifying ecosystem services, which was set up in 2009 and revised in 2013. It divides ecosystem services into ‘provisioning’, ‘regulating’ and ‘cultural’ services. Each of these principal services is then separated further into ‘divisions’, ‘groups’ and ‘classes.’ This means that users can identify the level of detail in classification that is appropriate for any given use case.

Further reading: https://cices.eu/

Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.

The Ecosystem Services Approach integrates the concept of ecosystem services with decision-making and land management. It looks to address the services which an ecosystem provides to humans alongside the tangible assets provided by the land and/or sea. When looking at an agricultural landscape, for example, taking the ecosystem services approach would look at the water supply, soil quality and cultural benefits an area provides, with the aim of enhancing these in order to maintain the agricultural success alongside the other benefits the area delivers to people.

There are a range of initiatives which incorporate the ecosystem service approach into their work:

- The International Partnership for the Satoyama Initiative (IPSI)
- The Madingley Model - General Ecosystem Model (GEM)
- Trends in Ecosystem Services (TeSE) business initiative
- Corporate Ecosystem Services Review (ESR)
- Integrated Landscape management

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Environmental Extensions

Environmental extensions are satellite accounts associated with Multi-regional input-output (MRIO) modelling. Whilst MRIO's model the values and volumes of traded commodities, environmental extensions predict the extent of the environmental impact associated with a given value or volume of a commodity produced in any one country or region. Environmental extensions typically rely on combining multiple global data sources. Environmental extensions utilised for measuring impacts in each MRIO model are typically not the same but may share common features. As part of the work underpinning this guide, a comparative review of environmental extensions in Exiobase and EORA was conducted, the results of which can be found here.

Examples of the extensions associated with MRIOs include:

- Exiobase has extensions for:
  - Land use
  - Water use
  - Air emissions & GHG emissions
  - Nitrogen & phosphorous emissions
  - Materials flows
- EORA has extensions for:
  - GHG emissions
  - Land use
  - Water use
  - Air emissions
  - Materials use
  - Nitrogen & phosphorous emissions
  - Agricultural inputs
  - Biodiversity loss
- The OECD Inter-Country Input-Output model
  - Energy use
- The Global Trade Analysis Project (GTAP)
  - CO2 emissions

Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.

- The World Input-Output Database (WIOD) - includes input-output tables and underlying data.
    - Energy use
    - GHG emissions
    - Land use
    - Water use
    - Air emissions
    - Nitrogen & phosphorous emissions
    - Materials flows

Initiatives that have focussed on improving or building custom made environmental extensions include:

- Policy-Relevant Indicators for National Consumption and Environment (PRINCE)
- Compiling and Refining Environmental and Economic Accounts (CREEA)
- JNCC / Route2 indicator project

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Farm-scale assessments

Farm-scale assessments are environmental measurements taken at the scale of an individual farm, reflecting the pressures the farm's management practices are placing on the environment. This small-scale assessment can be very specific and detailed in terms of data collection and can be easier to set actionable targets against than larger-scale impact measurements. Improvements in management practices at a farm-scale could help solve environmental problems whilst also supporting local livelihoods. However, some producers do not have the resource, capacity or expertise to undertake this type of assessment. Farm-scale assessment also often only consider on-farm impacts, meaning that it is difficult to understand any indirect impacts caused by the farm in question, such as displacement.

Farm-scale assessments could include:

- Assessment for the farm to be awarded certified status by a certification scheme.
- Life Cycle Assessment (LCA) studies. These can be an LCA study of a farm as a functional unit.
- Tools aimed at informing farmers, so they are able to make informed choices on the sustainability of the practices that they undertake, such as the Cool Farm Tool.

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Foot-printing

Foot-printing is the calculation of a total impact caused by either a country's, population's or individual's consumption generally, and this is measured by using a proxy for impact. An example would be calculation of the total land used, carbon emitted or biodiversity lost, as required to produce all commodities consumed within a country, by a population or by an individual. Examples of techniques used to calculate footprints include:

- The Global Footprint Network's Ecological Footprint[62], which estimates the total ecological assets that a given population produces and consumes. The footprint is based on the difference between production capacity and total consumption which tells you whether the footprint exceeds the biocapacity (ability for regeneration) or not.
- MRIO analysis, which can be used to model global trade flows and estimate the sourcing patterns of a country's consumption, including the land use, carbon emissions and other pressures this causes.

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Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.

Hot-spotting tools

Hot-spotting is a spatial analysis technique that identifies areas with significantly high (hotspots) or significantly low (cold spots) values of a variable being compared across the spatial range.

In the field of sustainable production and consumption, it could be used, for example, to analyse data on commodity-related deforestation. Areas with high rates of both deforestation and increase in land use recorded for a particular commodity could be identified as hotspots. These areas, and the commodities identified, could therefore be prioritised for conservation action.

Similarly, if modelling the geographic distribution of the environmental impacts of a country or a business' consumption, source countries with a high impact could be prioritised for action – either in terms of moving sourcing to elsewhere or working with locals on the ground to improve the sustainability of their production practices.

Examples of tools that could be used for hot-spotting include:

- SCP Hotspot Analysis Tool
- JNCC / Route2 indicator project

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Integrated landscape approaches

Taking the landscape approach involves considering the whole landscape when making decisions about the management of an area, including impacts caused by all stakeholders within the area. The landscape in question could be any defined area at a scale larger than an individual farm. However, it would normally be an ecological or geographic unit, such as a biome or watershed. Taking a landscape approach allows for consideration of how changes within a focal area might affect the area outside it indirectly, for example through displacement. It encourages actors to consider how a management change might impact the entire landscape and whether this change is in fact net positive for the environment. The approach is about optimally balancing competing land use demands for both the well-being of humans and the environment. The importance of food and livelihoods, finance, rights, restoration and progress towards climate and development goals must all be considered.[63] The landscape approach is often used in conjunction with the ecosystem services approach.

Integrated landscape approaches are incorporated within land management and wider policy processes. There are several initiatives which look at how this might be done or how the landscape approach might be achieved:

- The Global Landscapes Forum
- The Land Use Dialogue (LUD)
- Tropical Landscapes Finance Facility
- Building productive and sustainable landscapes and livelihoods
- Business for Sustainable Landscapes
- Integrated landscape management
- Landscapes for People, Food and Nature Initiative (LPFN)

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Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.

Life Cycle Analysis and Life Cycle Impact Assessment

Life Cycle Analysis (LCA) calculates all of the inputs and releases associated with a given product or commodity throughout its lifespan, with a defined system boundary. For example, if analysing the production of a typical apple, the inputs may include the land area, water and fertiliser required for its growth; the releases may include the nitrogen and phosphorous pollution caused by fertiliser application and carbon emissions from the apple's transport from farm to shop, in addition to the apple itself.

Life Cycle Impact Assessment (LCIA) estimates the impacts from the inputs and releases associated with a product or commodity. Taking the apple example from above, LCIA may translate the carbon emitted into the effects this would have on global warming, or the land used into the likely resulting loss in biodiversity (for example through the use of species-area models).

LCA and LCIA allow for direct comparisons to be made between the impacts associated with different production systems and management practices (e.g. grass-fed or improved pasture beef) or between substitutable products (e.g. dairy milk, soy milk, almond milk and rice milk).

They were originally designed to be implemented at an individual company scale, although the systems-thinking style approach can be scaled up through the use of weighted averages up to global (e.g. Poore and Nemecek, 2019) or national (e.g. LC-Impact) scales.

Examples of initiatives and databases with a focus on LCA / LCIA:

- LC-Impact
- Harmonized Environmental Storage and Tracking of the Impacts of Agriculture (HESTIA initiative)
- ReCiPe
- UN Life Cycle Initiative

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MRIO modelling

Multi-regional input-output (MRIO) models are an economic tool used to model global trade flows. They do this through tables representing the monetary inputs and outputs across different countries and their commercial sectors (e.g. oilseeds, cattle farming, paddy rice, etc).

MRIOs can be used to estimate the sourcing patterns of a country's consumption. For example, they can show the likely proportion of a commodity consumed in the UK that was originally grown in any country or region of the world.

There are two main advantages of using MRIO modelling over conventional trade data (which is recorded bilaterally between the two trading countries). Firstly, they allow for prediction of the true country of origin, rather than the final country from which a product was directly imported (which may have been an intermediate trader or involved in processing rather than initial production). Secondly, they estimate total consumption of raw commodities, rather than relying on import data based on final product. This allows for analysis of products that are embedded within other products (e.g. oilseeds within cosmetics).

The modelling assumes that a country's exports of a particular commodity are proportional to the total of the country's own imports of this commodity, plus its domestic production. Therefore, MRIOs show the most likely source country, rather than the true source country.

Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.

MRIOs are an important and widespread tool within the field of sustainable production and consumption, as they allow for commodity production to be linked to final consumers. This allows consuming countries to take responsibility for the likely impact they have overseas. They may use this as a hot-spotting tool in order to identify areas and sectors in which they have the highest risk of impact, in order to focus on implementing solutions where they are most needed.

It is possible to hybridise financial data with physical data to get better geographic and commodity resolution. SEI's IOTA model is a hybridised MRIO for example[64].

Many MRIOs also have environmental extensions, which provide additional data on environmentally relevant metrics, such as the land use, water use and carbon emissions associated with production of each commodity.

Examples of MRIOs include:

- Exiobase
- EORA
- The OECD Inter-Country Input-Output model
- The Global Trade Analysis Project (GTAP)
- The World Input-Output Tables and underlying data (WIOD)

Examples of initiatives utilising MRIOs include:

- PRINCE
- Environmental Impact Index
- IOTA – SEI
- JNCC / Route2 indicator project
- SCP hotspot analysis tool
- CREEA

Policy testbeds

Policy testbeds are scenario modelling tools that have been specifically developed to support policy decisions. This allows policymakers to input policies of specific interest to the tool and view the impacts that such policies would have if implemented. For example, if there were two competing theories about how to best reduce carbon emissions associated with commodity consumption, a testbed could be developed that would run each scenario and predict the impact of each.

Examples of sustainability initiatives that involve policy testbeds include:

- Co$ting Nature
- Global Biodiversity Model (GLOBIO model)
- EX- Ante Carbon balance Tool (EX-ACT)

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Scenario models

Scenario modelling involves the prediction of a variety of possible futures that differ based on one factor. Where this factor is a choice that can be made, scenario modelling can assist in decision making, by demonstrating the impact of a range of choices. For example, a scenario model could predict that if land use change for commodity production continues at its current rate, we will have lost X% of global biodiversity by 2050, whereas if we stop all new land conversion from now on, we will have only lost X% global biodiversity by the same date. This provides a clear demonstration of the consequences of certain actions, which can drive positive change and help to ensure informed choices are being made.

Examples of initiatives that involve scenario modelling include:

- Co$ting Nature
- Dynamic general vegetation models (DGVMs)
- Environmental Profit & Loss Account (EP&L)
- EX- Ante Carbon balance Tool (EX-ACT)
- Global Biodiversity Model (GLOBIO model)
- The Madingley Model. General Ecosystem Model (GEM)

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Supply chain risk assessment

A method by which an organisation measures the risk to the integrity or sustainability of their supply chain. This is often considered as part of wider supply chain risk management - the process by which an organisation takes strategic steps to identify, assess and manage risks to their supply chains. When applying specifically to one commodity this can be called risk profiling. There are many available tools for risk assessing supply chains and various commodities, and at different scales:

- GMAP - The Global Map of Environmental & Social Risks in Agro-Commodity Production
- The Soy Toolkit
- PalmTrace
- Safe trace
- SCRIPT
- Sedex
- SourceMap
- SPOTT

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Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.

Sustainability Frameworks

Frameworks which define sustainability for multiple sectors or by a set of impacts which can be monitored and reported on such as:

- *The Accountability Framework Initiative (AFI)*

The AFI aims to help companies, producers, and governments overcome barriers to transform supply chains on a broad scale. It has developed a practical roadmap that offers principles, guidance and tools for actors at every step of an agricultural or forestry supply chain. This includes providing 'common definitions, norms and guidelines' to support companies in setting, delivering and monitoring any environmental and social supply chain commitments that they have made. They aim to increase consistency and cohesion between the many separate initiatives and efforts that are already underway, across commodities and across the world. The initiative is based on ideas from a diverse set of conservation and human rights NGOs and other key stakeholders, for example within the private sector.

Like the Natural Capital Protocol, the broad scope of this initiative means it is widely implemented across sectors, although it is more focussed on deforestation, human rights violations and conversion of natural ecosystems, i.e. the large-scale impacts of development overseas.

Further reading: https://accountability-framework.org/

- *Natural Capital Protocol*

The Natural Capital Protocol is an internationally standardised decision-making framework designed to help with the identification, quantification and prioritisation of an organisation's direct and indirect effects and reliance on natural capital. Its cross-sectoral application means it is implemented by hundreds of organisations with diverse business objectives.

Further reading: https://naturalcapitalcoalition.org/natural-capital-protocol/

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Sustainability Investments

Financial services which integrate environmental, social and governance (ESG) criteria into investment decisions are called sustainability investments. There are several types of these, each one is explained briefly below:

- ***Green bonds –*** Green bonds are designated bonds intended to encourage sustainability and to support climate-related or other types of environmental projects. Green bonds come with tax incentives such as tax exemption and tax credits, making them a more attractive investment compared to a comparable taxable bond. Related initiatives:
  - The Green Bond Principles
- ***Sustainable stocks and shares –*** Increasingly individuals can invest money in mutual funds, investment trusts, stocks and shares pots or ISAs which only invest their money in companies that support ethical and sustainability objectives thus driving investment in sustainability.
- ***Impact investing –*** according to The Forum for Sustainable and Responsible Investments, Sustainable, Responsible and Impact investing (SRI) 'is an investment discipline that considers Environmental, Social and Corporate Governance (ESG) criteria to generate long-term competitive financial returns and positive societal impact'[65]. Related initiatives:
  - Global Impact Investing Network
  - Global Trade Finance Programme
  - CRIC (Corporate Responsibility Interface Centre)

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Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.

Trade flow models

Trade flow models use economic techniques to estimate global trade flows. This is important within the field of sustainable production and consumption, as it allows for commodity production to be linked to final consumption. The degree to which the models rely on empirical trade data and assumptions to bring this data together varies. This allows consuming countries to take responsibility for their overseas impact. They may use this as a hot-spotting tool in order to identify areas and sectors in which they have the highest risk of impact, in order to focus on implementing solutions where they are most needed.

Examples of trade flow models include:

- MRIO modelling
  - Exiobase
  - EORA
  - The Global Trade Analysis Project (GTAP)
- Material Flow Analysis
  - TRASE – sub-national links allowing for differences in regional production to be accounted for allowing for clear links to impact to be understood[66].
- Resource trade (Chatham House) - makes national links

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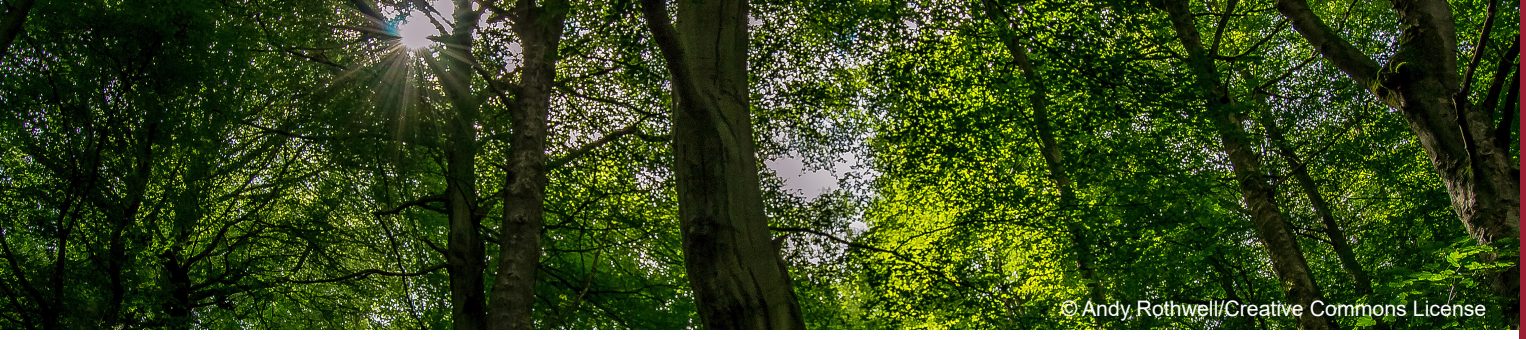
Please see the Trade and Environment Initiatives Spreadsheet for further information on the listed tools and technique, it can also be searched for other available initiatives.



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