Agricultural Supply Chains

Meeting Report: Enhancing agricultural commodity supply chain sustainability

Methodologies, tools and metrics for measuring the biodiversity costs of agricultural commodity supply chain sustainability

With input from authors across

TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

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Key Messages

Agricultural supply chains deliver important impacts on biodiversity and can have positive or negative impacts on people in production areas. There is a clear dependency on nature for many supply chains of products widely used by people: over 50% of the world's total GDP is dependent on nature and its services.[1] Dependency, however, needs to be better understood and reflected in the action-policy arena.

As a reflection on these issues, below we present key messages from the meeting participants and keynote speakers, grouped by thematic categories.

Key Messages from the Meeting Participants

Supply Chains in General

- Supply chains can be complex; there are many definitions, actors and costs involved, and several different approaches to improving transparency and/or traceability. Bespoke actions are needed for individual supply chains, countries and actors.
- The transformations needed for a more sustainable supply chain should consider the resources and the costs, and more importantly, who will bear these costs.
- Business and financial agencies are put off by the complexity of addressing biodiversity issues even though they may want to act
- There is a general lack of a common understanding/definition of sustainable trade, but this should not prevent us acting now.

[1] World Economic Forum 2020 Report - https://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf

Smallholder Farmers

- More emphasis needs to be placed on empowering and building capacity for farmers and forest users to shift to more sustainable practices and obtain sustainable economic returns.
- Smallholder farmers in particular need more financial and associated capacity-building support to transition to more sustainable practices.
- Generally, for most agricultural commodities, it is more effective if smallholder farmers speak with unified voices, through organized cooperatives.

Certification Schemes

- In general, the number of different certification schemes makes it complicated for producers and consumer to navigate this landscape of schemes.
- For some commodities such as palm oil, the amount that is already certified is larger than the demand for certified products, hence work is needed to increase the demand for products produced in the most sustainable way.
- There also needs to be greater transparency in certification methods and an ease of entry for small-scale farmers. This is especially important given that the certification landscape can be difficult to access and navigate, partly due to the large number of schemes available.
- Actions should be taken to better achieve an effective local-global connection—between what is happening at the farm level and the global trade/environment agendas.

Methodologies, Tools and Metrics

- There are several methodologies, tools and metrics which map and measure impacts of supply chains or provide advice on improving commodity sustainability. These can inform different decisions of various user groups, including private sector and policy makers.

- There is a need for more guidance and capacity-building on existing methodologies, tools and metrics, to clearly show what they deliver, to which extent, how far they can reach along the supply chain, and what their limitations are. Tools, as well as guidance on using them, should be specific to user groups.

- It is key to remain focused on the purpose of the methodologies, tools and metrics and how they can inform action. Where clear gaps exist and current tools and metrics cannot provide the answers needed, collaborative efforts are needed to identify and address these gaps in knowledge. This will help to understand where further work is needed, as well as prevent unnecessary proliferation of tools where existing methodologies could be better utilised.

- Further work is needed to develop tools, methods and strategies that better enable financial revenues, cash and added value flow from the final consumer, back to farmers, to provide the incentives needed to transition to sustainable production systems.

- A system such as the Trade Tools Navigator under development at UNEP-WCMC via the TRADE Hub project is a useful place to catalogue the available trade related tools. But there are things to do to make the existing beta product more useful. And there remains an issue of how tools like this are kept updated to maintain their utility.

Keynote Speaker Presentation Summaries

Neville Ash

UNEP-WCMC Director

- There is a growing importance of international agricultural supply chains in meeting global food preferences, and needs for food security and nutrition.
- However, food systems are the main driver of biodiversity loss on land and in the ocean, and the sustainability of food systems is undermined by the “cheap food” paradigm.
- Transformations are needed to ensure sustainability in food systems, including in farming practices, spatial planning, dietary choice of consumers, and addressing food waste.
- Such transformations depend on understanding of food system impacts and dependencies on nature, and converting existing sustainability commitments into action.
- Various methods, tools and approaches are available to measure the biodiversity costs of agricultural commodity supply chains so that these costs can be mitigated and managed.
- Spatial specificity is essential to understand and act on biodiversity impacts and dependencies.
- There’s lots to build on, and discussions at this technical meeting important for coordination amongst tool developers, data providers, and users and ensuring coherence in further development of the agricultural supply chain community.

Sir Graham Wynne

Former Chief Executive of the RSPB and Senior Fellow at WRI

- Asking better questions - e.g., what are we measuring and why/what for - based on existing tools.
- Understanding better which tool does what - linked to the need for more guidance and capacity-building on existing tools.
- Finding the balance between creating/using too many tools and taking actions with what we already know that existing tools are telling us.
- Focusing the tool guidance and, if needed, development for different user groups who have a specific need, rather than providing generic tools that are not that useful to any one user group. Guidance should not be prescriptive about tools, but should identify what kinds of items should be measured, and how far they can reach along the commodity supply chains (i.e. include their limitations).
- Further work should develop tools, methods and strategies to generate accurate information on how do financial revenues, cash and added value flow from the final consumer, back to farmers, passing through the other links (typically retailers, distributors, processors, traders and intermediaries).
- Usually, we already know enough to act. Creating more tools can be counterproductive— adding to the complexity and the confusion.

Jonny Hughes

WCMC Chief Executive Officer, UNEP-WCMC

- More effort is needed on figuring out simple, clear ways of making complex local-global connections (from 'farm to fork') significantly more visible and transparent for a range of audiences, from policy makers to consumers.
- Improving the environmental sustainability of commodity value chains is not enough in itself. We need to deliver environmental goals in synergy with social goals using an integrated 'capitals approach'. In taking such an approach, several Sustainable Development Goals can be realised in one package with greater efficiency, ultimately benefitting actors throughout the value chain.
- There is need to ensure we are signposting to and/or further refining a trusted, core set of powerful value chain analysis tools which are designed with the user needs in mind.

Introduction

Higher volumes of international trade have contributed in significant ways to economic growth and development, while around 50% of the world economy is at least moderately dependent upon nature.[2] However, increasingly, there is compelling evidence that much of global trade is associated with significant negative impacts on biodiversity and people in disadvantaged situations. To decouple economic growth from its impact on the Earth's ecosystems, we need to understand the linkages between them.

The intricate web of supply chains underlying our economies mean that negative trade-related impacts on nature and people can be shifted around the world, from exporters to importers and buyers to sellers. These impacts are difficult to trace and attribute due to complex market interconnections. Global supply chains can also amplify the impacts of the differences in regulatory environments and market incentives in varying locations.

We need better ways to understand the connections between economic and practical activities on the ground and their effects on the complex supply chains that are often behind them. These connections might potentially be facilitated by the further development of suitable methodologies, tools and metrics that help to understand the flow of specific goods in supply chains. Ultimately, tools will need to aim at measuring the biodiversity impacts at all stages of commodity supply chains. This was one of our main hypotheses when we planned the meeting.

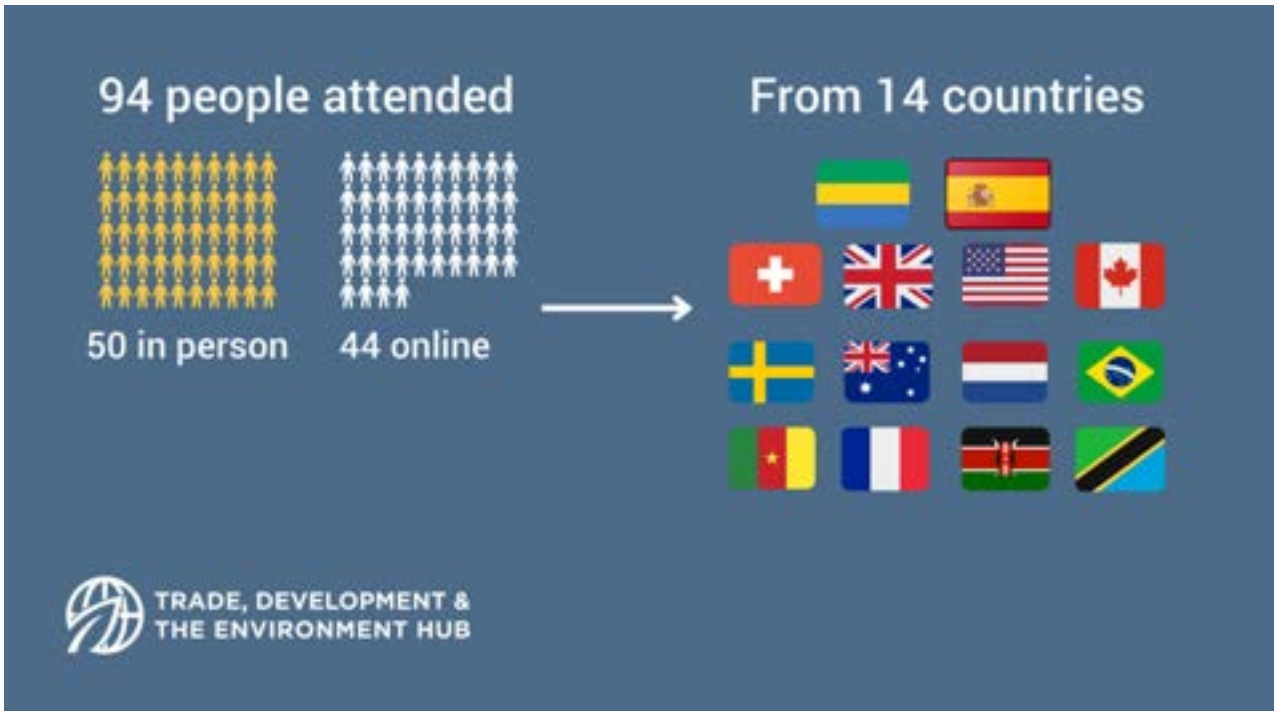
Image of the conference room.

[2] World Economic Forum: https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-or-highly-dependent-on-nature-says-new-report/

This 3-day hybrid meeting brought together 94 experts from 14 countries (Figure 1) on supply chains and methodologies, tools and metrics to enhance the collective understanding of approaches to address agricultural commodity supply chain impacts on nature and people. Building on that, the meeting aimed to identify next steps to solve remaining challenges to update and/or provide tools and approaches to support identification and transition to more sustainable supply chains.

This workshop report provides a summary of the material and reflections presented by attendees on day 1, and the discussions in focus groups that followed on days 2 and 3. For further reflection on these, our blog post is available here: https://tradehub.earth/

Figure 1: Attendance online and in person (Cambridge, UK) at the TRADE Hub supply chains meeting 20-22 April 2022.



Policy and National Perspectives

The general policy landscape, especially in some regions of the world (EU and UK and others stand out in this regard), is moving towards greener trade systems that have lower impact on biodiversity (habitats, species and genes), reduce climate change and also maintain ecosystem services which are of benefit to people (for example clean water).

Pascal Lamy, Chair of the TRADE Hub Advisory Board, focused on the World Trade Organisation (WTO)'s work on sustainable trade and the consideration of green supply chain issues, and advised the meeting on the following broad areas that need further attention:

Pascal Lamy presenting virtually to the group.

- We must move from protecting the economy to precaution (protecting people from risk).
- Shifting focus to 'precautionism', discrepancies between the preferences of relevant stakeholders will be an issue.
- Engage the consumer as well as the transformation and the distribution sides to better understand and reflect the changing.
- Carbon and biodiversity impact reporting and policy should be standardised across all supply chain actors.
- WTO needs to have a larger role in dealing with conflicting interests and deciding what to prioritise.
- There is a need for a forum around the implementation and design of standards, with better representation of all stakeholders along the supply chain.
- We must look across the entirety of the supply chain. As well as focussing on farms, however, there is a need to engage the consumption side (i.e., consumers) and the changing collective dietary preferences of consumers, for example the increase of artificial meat.

Some practical steps have been taken in the past year, including the launch of three (3) Ministerial Statements supported by WTO members to address: 1) Trade and environmental sustainability, 2) Plastics pollution, 3) Fossil fuel subsidies reform. These statements have signalled the openness to identify new opportunities for collaboration to improve the sustainability of trade.[3] The TRADE Hub project has supported these efforts by the trade community with publications such as:

- Greening International Trade. [4]
- Biodiversity and International Trade: Policy Primer; [5] and
- Trade, Development and Nature: An Introductory Learning Companion[6] Trade, Development and Nature: an Introductory Learning Companion.

Sir Graham Wynne presenting to the group.

Sir Graham Wynne highlighted how the UN climate convention (United Nations Framework Convention on Climate Change - UNFCCC)[7] has shifted in recent years to more heavily consider the role of forests and other natural habitats like peatlands in the climate system, and the prevention of greenhouse gas emissions linked to global warming. At the last conference of parties in Glasgow in late 2021 (UNFCCC COP26), this included several important declarations around deforestation-free supply chains[8] (Box 1).

Furthermore, there is emerging legislation on deforestation-free supply chains in the United States of America (USA),[9] United Kingdom (UK),[10] and the European Union (EU).[11] Maddie Harris, Analyst at Joint Nature Conservation Committee (JNCC), provided further details on supply-chain related statistic and visualisation[12] developed to support the UK's Environment Act.

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[3] Twelfth WTO Ministerial Conference: https://www.wto.org/english/thewto_e/minist_e/mc12_e/mc12_e.html
[4] Greening International Trade: https://tradehub.earth/wp-content/uploads/2021/11/Greening-International-Trade_18.07.2021.pdf
[5] Biodiversity and international trade policy primer: https://tradehub.earth/wp-content/uploads/2021/11/Biodiversity-and-International-Trade-Policy-Primer-Document_05.pdf
[6] Trade, Development and Nature: An Introductory Learning Companion: https://www.unep.org/resources/publication/trade-development-and-nature-introductory-learning-companion
[7] UNFCCC https://unfccc.int/
[8] Removing commodity driven deforestation from all supply chains by 2020: https://unfccc.int/news/removing-commodity-driven-deforestation-from-all-supply-chains-by-2020
[9] FOREST Act of 2021: https://www.congress.gov/bill/117th-congress/senate-bill/2950/text
[10] UK Environment bill: https://www.gov.uk/government/publications/environment-bill-2020
[11] EU for a regulation on deforestation-free products: https://ec.europa.eu/environment/publications/proposal-regulation-deforestation-free-products_en
[12] https://jncc.gov.uk/our-work/environmental-impacts-of-uk-supply-chains/

Box 1: Key supply chain-related declarations and pledges at COP26

- Glasgow Leaders Declaration on Forests and Land Use (GLD): Includes undertakings on Trade and Development and Finance. 142 countries holding 91% of global forests.
- Forest, Agriculture and Commodity Trade (FACT) dialogue: Supports sustainable trade between commodity producing and consuming countries – trade as part of the solution. 28 countries representing 75% global trade in forest risk commodities.
- Global Forest Finance Pledge: $12 billion public funds.
- Private sector and philanthropic declarations: $7 billion funds committed.
- Agricultural Commodity Companies Corporate Statement of Purpose: 10 major global companies commit to roadmap for action consistent with 1.5C pathway by COP 27.

Free Trade Agreements are also a key mechanism to implement agreed policy between consuming and producing nations. There are encouraging signs that these are starting to cover more environmental areas, including biodiversity (see for example the recent guidance on assessing the biodiversity impacts of EU free-trade-agreements (FTAs)[13]

David Cooper, Deputy Executive Secretary of the Convention on Biological Diversity (CBD), highlighted proposed targets related to sustainable production and consumption and greener supply chains in the draft post-2020 global biodiversity framework.[14] These included Targets 15, on business assessment and report on dependency and impact on biodiversity, and 18, on redirecting harmful incentives for biodiversity to positive ones. Another relevant target is the integration of biodiversity values into policies and regulations across all governmental and economical sectors, Target 14. These targets will need to be backed up by appropriate indicators, supported by suitable methodologies, tools and metrics. He also summarized the results of a negotiator-oriented workshop on trade and biodiversity in the context of the post-2020 global biodiversity framework,[15] organised by the United Nations Conference on Trade and Development (UNCTAD) in cooperation with the CBD Secretariat in March 2021.

[13] FTAs on biodiversity and ecosystems: Methodology for assessing the impacts of trade agreements on biodiversity and ecosystems https://research.vu.nl/en/publications/methodology-for-assessing-the-impacts-of-trade-agreements-on-biod

[14] Post 2020 Indicators: https://www.post-2020indicators.org/

[15] Online workshop on trade and biodiversity for the post-2020 global biodiversity framework: https://unctad.org/system/files/information Document/ditc-ted-24032021-post2020-report-2.pdf

The work of the CBD can also be supported through examining the biodiversity impacts of different global trade and conservation policy scenarios. Pathways to sustainable trade and to 'bend the curve' of biodiversity loss[16] are being developed and the potential impact of the post-2020 global biodiversity framework is also being studied by TRADE Hub researchers. A new platform, PLANGEA,[17] defines the impacts on biodiversity and nature's contributions to people in different scenarios, helping to make decisions about restoration, conservation and conversion activities.

Business Perspectives

There is a shifting policy and geopolitical landscape for businesses to operate in. Businesses need to avoid risk, preserve raw materials flows, and embrace a sense of responsibility for the biosphere. Businesses of all kinds, from supply chain companies, ratings agencies to banks and pension funds are increasingly considering the impacts, and dependencies, of their supply chains on biodiversity and people. This includes reducing negative impacts, ensuring their business can continue to thrive into the future and taking a viewpoint on what a responsible and sustainable business for the future should look like.

Several bodies are developing guidance, standards and associated methodologies, tools and metrics to help businesses address supply chain related impacts. Examples include:

- The 'Science Based Targets Network for Nature[18] which is engaging hundreds of companies to set targets on nature, including within their supply chains.
- The Task Force for Nature-related Financial Disclosures[19] for companies and financial institutions to report and act on nature related impacts and dependencies, including their supply chains.
- The 'Align' project[20] that is developing recommendations and guidance for businesses on measuring impacts and dependencies on biodiversity, including for supply chains.
- Business led initiatives such as the One Planet Business for Biodiversity coalition[21] to support implementation of commitments made.
- Business risk assessment tools such as IBAT,[22] Global Forest Watch Pro,[23] SPOTT.[24]
- Supply chain traceability tools – Trase,[25] Trase Finance.[26]
- Materiality assessment tools like ENCORE.[27]
- Life Cycle Assessment by tools[28] such as LC-IMPACT, SCP Hat.

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[16] Bending the curve of terrestrial biodiversity needs an integrated strategy: https://www.nature.com/articles/s41586-020-2705-y
[17] IIS output – PLANGEA: https://projetos.iis-rio.org/globo/
[18] Science Based Targets Network for Nature - https://sciencebasedtargets.org/about-us/sbtn
[19] Task Force for Nature-related Financial Disclosures - https://tnfd.global/
[20] The 'Align' project - https://ec.europa.eu/environment/biodiversity/business/align/index_en.htm
[21] One Planet Business for Biodiversity coalition - https://op2b.org/
[22] IBAT - https://www.ibat-alliance.org/
[23] Global Forest Watch - https://pro.globalforestwatch.org/
[24] ZSL SPOTT - https://www.spott.org/palm-oil/
[25] Trase - https://www.trase.earth/
[26] Trase Finance - https://trase.finance/
[27] ENCORE - https://encore.naturalcapital.finance/en
[28] Life cycle assessment tools https://lc-impact.eu/ & http://scp-hat.lifecycleinitiative.org/

The complex landscape of methodologies, tools and metrics are leading many companies to develop their own bespoke approaches, leading to further proliferation of approaches.

Focus should not just be on the development and refinement of metrics and tools, but also consideration is needed of how these will be applied and what change in business practice will occur as a result. Different tools and metrics will inform different decisions – from risk assessment to performance monitoring - and greater awareness is needed on the applicability of different approaches for different business contexts.

Getting started can in itself be a barrier for business. CISL presented a corporate diagnostic tool[29] that aims to advance organisational understanding of nature-based solutions projects and accelerate their adoption and implementation within companies.

During the meeting we convened several working groups to discuss different aspects of the agricultural supply chain system from farmers to consumers and focusing on the key commodities that are under study by the TRADE Hub. The formulation of these groups was informed by the work done in the TRADE Hub interim impact report.[30]

Attendees conversing in breakout groups.

[29] Decision making in a nature positive world: https://www.cisl.cam.ac.uk/resources/publications/decision-making-nature-positive-world
[30] TRADE Hub (2022). 2021/22 interim impact report. UNEP-WCMC, Cambridge, UK: https://tradehub.earth/wp-content/uploads/2022/04/FINAL-INTERIM-DOC.pdf

Notes from Working Group Sessions

Users

Farmers, traders, intermediaries

The primary set of tools in use for these users are related to various certification schemes and their associated guidance documents. These tend to be specific to different commodities. There are also international organisations associated with different commodities. Examples include the International Coffee Organisation[31] and the International Cocoa Organisation.[32] These organizations maintain databases of trade flows at national levels. They also have systems and tools in place to help enhance sustainability and reduce forest loss, biodiversity and social impacts at the farmer level through the supply chain.

Nations

At the national level, methodologies and tools are being developed that service deforestation risk monitoring commitments. For example, the UK Government has developed a UK overseas impact indicator.[33] This tool is focused on deforestation risk in commodities and could be expanded to cover biodiversity risks. Chatham House has a trade visualisation platform[34] and there are similar tools available through the Organisation for Economic Co-operation and Development (OECD),[35] UNCTAD,[36] and others.

Relevant spatial data and country profiles, country level analytical capability are contained with the IBAT tool and the UN Biodiversity Lab.[37]

National indicators being proposed to track target 15— business assessment and report on dependency and impact on biodiversity— of the post-2020 global biodiversity framework are presented in a tool for all proposed post-2020 indicators.[38] Ultimately progress of nationals towards this target (and Target 18 on sustainable production and consumption) will also need to be tracked over time.

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[31] International Coffee Organisation - https://www.ico.org/
[32] International Cocoa Organisation - https://www.icco.org/
[33] UK overseas impact indicator - https://jncc.gov.uk/news/new-experimental-statistic-released/
[34] Resource Trade Earth: https://resourcetrade.earth/
[35] OECD - https://data.oecd.org/
[36] UNCTAD - https://unctadstat.unctad.org/EN/
[37] UN Biodiversity Lab - https://unbiodiversitylab.org/
[38] Post 2020 Indicators - https://www.post-2020indicators.org/

Supply chain companies

Several tools are developed or under development for supply chains and the related companies. Ones that are in the public domain include risk-based tools such as IBAT, but also commodity trade-specific tools like Trase Earth.[39] Some companies have developed their own systems using a variety of approaches, but typically including an understanding of the trade system, the sourcing and export of products, remote sensing of production sites, and in some cases links to biodiversity, social, ecosystem services, or carbon data – for example SHIFT which is a Search Engine for Business Sustainability Resources.[40]

Banks, investors, and ratings agencies

Some of this group uses existing risk-assessment and risk-screening tools. The International Finance Corporation, part of the World Bank Group uses Integrated Biodiversity Assessment Tool (IBAT) to screen investments. Another tool being used by banks to assess materiality is the ENCORE tool for the finance sector. A sector-level materiality tool being developed by the SBTN for companies, Cambridge Institute for Sustainability Leadership (CISL, a TRADE Hub project partner) has outlined sustainable trade finance along with the BEI's Sustainable Trade Finance Council.[41]

Retail companies

Retail companies are seeking to use existing guidance and tools, but in many cases their numerous complex supply chains are a challenge to assess. Implementation of the 'Soft Commodities' Compact[42] was a company-led initiative that worked with the banking industry to help transform soft commodity supply chains.

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[39] Trase Earth: https://www.trase.earth/
[40] SHIFT - http://shift.tools/
[41] Sustainable Trade Finance - https://www.cisl.cam.ac.uk/business-action/sustainable-finance/banking-environment-initiative/programme/restore-nature/sustainable-trade-finance
[42] Implementation of the 'Soft Commodities' Compact - https://www.cisl.cam.ac.uk/centres/centre-for-sustainable-finance/soft-commodities

Tools

Biodiversity Metrics

To support the development of the tools that are aiming to support the above user groups, an active area of research is underway to develop appropriate data layers or metrics for including within tools, or to be taken up by supporting bodies such as SBTN. Metrics that identify areas of biodiversity importance and respond to land-use change include the Species Threat Abatement and Recovery[43] (STAR). Similarly, Duran et al. 2020[44] and Green et al. 2019[45] describe a metric that is more sensitive to changes in species range. Metrics such as the mean species abundance (MSA) indicator,[46] the Biodiversity Intactness Index (BII)[47] and an emerging Ecosystem Intactness Index (Samantha Hill et al in prep) also address important dimension of biodiversity value. Work is also ongoing to link social metrics into trade related work (TRADE Hub in prep).

Some of the existing metrics have been linked to trade models. Most notably metrics that use loss of habitat to estimate the number of species lost (for example and non-exhaustive), using the countryside species area relationship (cSAR),[48] Chaudhary and Brooks 2018[49] & 2019[50] (area of habitat), de Baan et al. 2015[51] (using estimates of likelihood of persistence), Duran et al. 2020 & Green et al. 2020 (IUCN red list species ranges), Molotoks et al in review (various biodiversity metrics); or the biodiversity intactness index (BII) (Boakes in prep). Alternatively, global economic models can be linked to IUCN threat data to estimate relative threats to species (e.g. in the non-normalised Species Threat Abatement and Restoration (nSTAR); Irwin et al. 2020).[52]

Trade Tools Navigator

At the meeting UNEP-WCMC presented a trade tools navigator, – bringing together available tools for trade related use. The trade tools navigator also provides filters that allow users to locate the suite of possible tools that they might use. Participants found the navigator useful, but it needs further development to be launched for wider use. Generally, participants suggested to add guidance on the use of each tool. Guidance could contain details like the minimum needed for users to do, where to find data, and the tool limitations.

In the coming months the TRADE Hub will launch the online version of the Trade Tools Navigator.

Social considerations

In many supply chains there is a need to understand social impacts and tailor support depending on context. For example, the needs of existing farmers in the supply chain may differ from new farmers at the land clearance frontier (Box 2).

Box 2: Key issues when working on supply chain social sustainability

- Must work more closely with farmers on the ground to obtain data on the effects of different production types on biodiversity.
- Need to understand the effects of land disputes, land tenure security and politics.
- Involve communities on the ground: ask them questions around social implications relating to commodity type, scale, food security.

In terms of social assessment tools, the following need to be undertaken:

- Develop better social impact assessment and use this for indicators.
- Look at potential of incentive-based methods such as Payment for Ecosystem Services/. Need to consider countries where financial incentives may have negative impacts.
- Consider initial investment costs for farmers involved in implementing tools/sustainable practices.
- Develop context - and location -specific tools.
- Look at the potential for farmers unions and cooperatives to be involved in tool and metric development.
- Need to develop and use tools that benefit all stakeholders along the supply chain.
- Invest in training farmers on how to best use the available tools, as well as training around pest management, chemical use and optimal growth practices
- Need to understand the level of complexity required to achieve impact; farmers are not keen on complexity.

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[43] STAR - https://www.iucn.org/regions/washington-dc-office/our-work/species-threat-abatement-and-recovery-star-metric

[44] Durán A.P., Green J.M.H., West C.D. et al. (2020). 'A practical approach to measuring the biodiversity impacts of land conversion.' Methods Ecol Evol.; 11:910–921. https://doi.org/10.1111/2041-210X.13427

[45] Green J.M.H., Croft S., Durán A.P., Balmford A.P., Burgess N.D., Fick S., Gardner T.A., Godar J., Suavet C., Virah-Sawmy M., Young L.E. and West C.D. (2019) 'Linking global drivers of agricultural trade to on-the-ground impacts on biodiversity.' Proceedings of the National Academy of Sciences. Vol: 116. No. 46, 23202-23208. https://doi.org/10.1073/pnas.1905618116

[46] MSA metric is an indicator of local biodiversity intactness. MSA ranges from 0 to 1, where 1 means that the species assemblage is fully intact, and 0 means that all original species are extirpated (locally extinct).

[47] BII summarises the change in ecological communities in response to human pressures. The BII is an estimated percentage of the original number of species that remain and their abundance in any given area, despite human impacts.

[48] Land use biodiversity impacts embodied in international food trade - https://doi.org/10.1016/j.gloenvcha.2016.03.013

[49] Chaudhary A. and Brooks T.M. (2018). 'Land Use Intensity-Specific Global Characterization Factors to Assess Product Biodiversity Footprints.'

[50] Environmental Science & Technology. 52 (9), 5094-5104. DOI: 10.1021/acs.est.7b05570
Chaudhary A. and Brooks T.M. (2019). 'National Consumption and Global Trade Impacts on Biodiversity.' World Development, Elsevier, vol. 121(C), pages 178-187.

[51] de Baan L., Curran M., Rondinini C., Visconti P., Hellweg S., and Koellner T. (2015). 'High-resolution assessment of land use impacts on biodiversity in life cycle assessment using species habitat suitability models.' Environmental Science and Technology, 49(4), 2237–2244. https://doi.org/10.1021/es504380t

[52] Irwin A., Geschke A., Brooks T.M. et al. (2022) 'Quantifying and categorising national extinction-risk footprints.' Sci Rep 12, 5861. https://doi.org/10.1038/s41598-022-09827-0

Issues related to supply chains

Attendees online and in person were divided into working groups were structured around TRADE Hub commodities. Discussions centred around the following focal questions:

- The level of traceability along the supply chain.
- Tools available to measure this.
- What these tools do or do not measure (social, carbon and nature aspects).
- Gaps to address tool effectiveness.
- How impact might be better delivered.

Commodity	Key Challenges
Soy	Leakage • Leakage occurs when land uses harmful to conservation efforts (eg. deforestation) are displaced to areas beyond the administrative boundaries of a protected area, or to another country of administrative region of the same country. • The Brazil's Amazon Soy Moratorium (ASM) is a sectoral agreement under which commodities traders have agreed to avoid the purchase of soybeans from areas that were deforested after 2008. • This has led to increases in deforestation for soy expansion in the Cerrado, where these rules do not apply. • UK due diligence: we can't import soy from illegally deforested land, but this doesn't tackle leakage issues. Traceability [53] • Soy is often an intermediary product (large quantities made into animal feed/biofuel etc) – difficulties in tracing it through the supply chain to supermarket level. • Especially difficult to trace the soy which becomes oil, and to follow it through the supply chain past this point.

[53] Overview of traceability: Dabbene F., Gay P. and Tortia C. (2014). 'Traceability issues in food supply chain management: A review.' Biosystems Engineering, Volume 120, Pages 65-80, ISSN 1537-5110. https://doi.org/10.1016/j.biosystemseng.2013.09.006.

Soy	Certification Schemes • Certification labels and roundtables can be used to denote that crop production is sustainable, responsible or green.[54] • Difficult to certify soy products. • This can be due to lack of traceability, especially as around 20% of soy is converted into oil (Fraanje and Garnett 2020)[55] (can be mixture of certified and non-certified). • Difficulties with certifying meat where animals have been fed with soy products – starts to get very complicated, and is fundamentally confusing for consumers. Social Issues • Many more large mega-farms than smallholders – these are creating social issues such as land grabbing, displacement and child labour. • Mega farms are also characterised by intense agricultural practice which pollute water and impacts well-being of local people in the surrounding areas.

Next Steps: Soy

Legal Frameworks

- We must challenge due diligence at the WTO level. This needs to be standardised across all actors to decrease risk of leakage effects.

Tools and Data

- Discussions around existing work on forest carbon and deforestation measures, as well as company engagement.
- Useful tools exist such as World Resources Institute (WRI) Climate Watch.[56]
- There is a need to include more biodiversity measures in tools focussing on impacts of deforestation.
- More tools are centred on measuring carbon impacts than social impacts. We need to encompass social aspects (with a focus on farmers) to tackle soy sustainability issues.

[54] Edwards D.P. and Laurance S.G. (2012). 'Green labelling, sustainability and the expansion of tropical agriculture: Critical issues for certification schemes.' Biological Conservation, Volume 151, Issue 1, Pages 60-64. https://doi.org/10.1016/j.biocon.2012.01.017

[55] Fraanje W. and Garnett T. (2020). 'Soy: food, feed, and land use change.' (Foodsource: Building Blocks). Food Climate Research Network, University of Oxford.

[56] WRI Climate Watch - https://www.wri.org/initiatives/climate-watch

Commodity	Key Challenges
Oil Palm	Traceability • Currently, traceability from mill to refinery is much greater than refinery to consumer. • Traceability from producer to mill is also limited, partly because of the difficulty in obtaining data but also due to a current lack of suitable incentives.
	Certification Schemes • 2 categories of certification: identity preserved (where a mill takes fruit from its own certified plantation) and mass balance (where a mill takes fruit from other certified plantations). • Market issues: RSPO certified members account for 19% of global production and 7% of that is sold as uncertified because there is no market for it. • Difficult to certify end products because many contain both certified and uncertified palm oil. • Smallholders excluded from the market: certification is expensive, pricing out smallholders and decreasing incentive. • Certification fetches a higher premium, but this extra income funds costs of certification rather than generating profit.

Next Steps: Oil Palm

Tools and Data

- Better data and traceability are needed on the link between plantations and mills.
- To generate impact, utilising existing frameworks may be required. IBAT initially gained traction through helping companies report against the International Finance Corporation (IFC) Performance Standard 6.[57]

[57] IFC Performance Standard 6 - https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/performance-standards/ps6

- Many tools use satellite data to identify deforestation or assess the area of risk based on proximity to forests. However, deforestation risk assessment tools have not yet moved beyond geolocation. Although integrating biodiversity assessments and the technical calculation of scope 3 emissions (Greenhouse gas protocol)[58] is not yet required, moving towards using these tools will provide a better measure of impact
- A tool to inform the solutions and theory of change would be a useful development

Commodity	Key Challenges
Cocoa	Traceability • Cocoa growers are mainly smallholder farmers. Traceability is relatively good at this level, and includes using geolocation as a tool. • However, at the collector/middleman level, products are difficult to trace as sources are often mixed when small quantities are collected. • Social Issues • Issues of transitioning from food crops to cash. crops that may reduce food security for farmers as they depend more on trade and income for food. • Income and ability to appropriate income depends on international prices, yield (and thus farmers are vulnerable to climate change) and good functioning local markets that guarantee good prices to farmers. • Financial viability: unclear how much collectors/intermediary benefit financially from the supply chain. • The difficulty to identify and trace financial revenues, cash and added value and benefits from the final consumer, back to the other links (typically retailers, distributors, processors, traders, intermediaries and farmers) is among the main gaps in the methods & tools that further work might fill.

[58] Scope 3 technical calculation - https://ghgprotocol.org/scope-3-technical-calculation-guidance

Next Steps: Cocoa

Tools and Data

- There are some useful biodiversity and environment indicator tools and initiatives developed by WWF, IDH and Rainforest Alliance. However, more work is needed with farmers to allow them to understand how to best use these tools eg. training on using TRASE.
- Need to develop better social impact measurement tools.
- Might need to work more on feeding tools such as TRASE into regulations around the international trade system.

Certification and Standards

- Further work needed to better characterise financial flows especially regarding collectors/ intermediary.
- Product traceability needs to be improved as sources are often mixed. This makes certification more difficult and therefore impacts policy/international regulation around certification.

Commodity	Key Challenges
Coffee	Traceability • Links between farmers and millers are traceable, but traceability is more challenging for smaller-scale farmers and other levels of the supply chain. • National policy around traceability varies a lot between countries: producer countries regulate the coffee sector more than consumer countries.

Next Steps: Coffee

Tools and Data

- Current tools include certification schemes, blockchain technology and other technologies are emerging, but aren't widely used. We need to increase the uptake of these.
- Incorporation of biodiversity metrics: tools often focus on land use (and use this as a proxy for biodiversity), but tools measuring biodiversity need to be developed and increasingly used.

- Issues of scale: many tools measure production at the farm level. Need to develop tools which integrate information at a larger scale to give more substantive information on biodiversity.
- Social impact: this needs to be better integrated into the tool landscape
- Producers, especially small-scale farmers, need to be better supported with tools to increase economic viability of implementing sustainability measures
- Current tool: INA Trace[59]

Certification and Standards

- Market issues: some certified coffee is sold as uncertified due to lack of demand. We need ways of increasing market incentives for certified coffee
- Corporate sustainability KPIs exist, but these are self-reported and so maybe credibility needs improved.
- Need to facilitate harmonisation of sustainability measures and increase communication among retailers and key actors in the supply chain.

Commodity	Key Challenges
Timber	Traceability • Traceability varies depending on the product, country of production, and consumer market requirements. • In the EU context, it includes following documentary evidence, e.g. harvest permits, invoices, transport-related documents, depending on the supply chain of a product. • Tracking, tagging (printed, electronic) and DNA and stable isotopic ratio analysis are context-dependent options. • Satellite monitoring is increasingly used for deforestation checks and as part of origin claim verification. However, challenges with the granularity or timescale of satellite imagery varies geographically, which can limit the verification of deforestation events in a timely/precise-enough way.

[59] INA Trace website: https://www.nachhaltige-agrarlieferketten.org/en/in-practice/inatrace/

Next Steps: Timber

Legal Frameworks

- Traceability for legality is already required under the EU Timber Regulation (EUTR), UK Timber and Timber Products Placing on the Market Regulations (UKTR), US Lacey Act, the Australian Illegal Logging Prohibition Act.
- (ILPA), the Swiss Timber Trade Ordinance (TTO), the Korea Act on the Sustainable Use of Timbers, the Japan Clean Wood Act.
- Some consumer countries are working on legal measures to ensure the sustainability of timber/timber products entering their markets.
- While China, a key global importer of timber and timber products, is taking measures relating to the legality of timber entering its market through its revised Forest Law, it is as yet unclear how this will be implemented.
- Improve the integration of degradation definitions and monitoring tools into legal frameworks.

Tools and Data

- Continue making progress on remote sensing tools (focus on areas with limitations in frequency/granularity of data), as well as bar coding/tagging/blockchain and DNA technologies (increase reference datasets).
- Market issues: in Gabon, the market dictates whether timber supply chains are traced – need to find ways to increase market incentives for traceability before broadening the use of tools.

Annexes

- The TRADE Hub website:
https://tradehub.earth/

- Supply chains meeting, blog post:
https://tradehub.earth/2022/05/12/the-trade-hub-hosts-a-supply-chains-meeting-with-key-partners-and-stakeholders/

- Meeting agenda:
https://tradehub.earth/supply-chains-meeting-agenda/