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TESS Forum on Trade, Environment, & the SDGs

Identifying Environmentally Harmful Agricultural Subsidies at the International Level

Report of an International Expert Group on Environmentally Harmful Agricultural Subsidies

TESS Forum on Trade, Environment, & the SDGs

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Preface

As governments and stakeholders work to ensure sustainability in food production and trade, agricultural subsidies are a critical topic for attention given the clear evidence of their influence on international production and consumption patterns and their impacts on all three dimensions of sustainable development—environmental, economic, and social.

At the global level, the need to tackle the environmental impact of agricultural subsidies has been reaffirmed at the highest political level. The Kunming-Montreal Global Biodiversity Framework, adopted in 2022, calls for addressing subsidies harmful to biodiversity, in a "proportionate, just, fair, effective and equitable way" and reducing them by at least $500 billion per year by 2030. The Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action, signed by 159 heads of state at the 2023 United Nations Climate Change Conference, emphasizes the need to "revisit or reorient policies and public support" to tackle the issues associated with the food-climate nexus. At the World Trade Organization (WTO), a broad range of members have expressed their determination to make progress towards promoting sustainable agriculture and food systems.

So far, discussions on environmentally harmful subsidies have mostly focused on autonomous domestic reforms aimed at repurposing existing support towards the provision of public goods, sustainable practices, innovation, or research and development. In practice, such efforts would significantly benefit from cooperation at the international level to avoid a patchwork of uncoordinated initiatives, reduce the free rider problem, and alleviate concerns about the loss of competitiveness as a result of autonomous subsidy reform. A key prerequisite for such collective action, however, is the need to establish shared understandings of what constitutes environmentally harmful agricultural subsidies.

As a contribution to efforts currently underway in different fora, TESS convened an international group of world-leading experts on sustainable agriculture from academia, think tanks, international organizations, and stakeholder organizations representing a diversity of geographical origin and perspectives. The group was asked to contribute to building a shared understanding of what constitutes environmentally harmful agricultural subsidies to inform ongoing discussions at the international level in the WTO, OECD, FAO, UNEP, and World Bank and in the context of the Kunming-Montreal Global Biodiversity Framework. The expert group also served to foster exchanges between experts and organizations that are engaged in different ways in key processes or initiatives relevant to the reduction of environmentally harmful subsidies.

Discussions were informed by inputs coming from different members of the group as well as informal consultations with key delegations active in the WTO. The present report reflects a collective, cooperative effort among the expert group members to identify environmentally harmful agricultural subsidies and options to tackle through international cooperation.

We hope that dialogue around the findings of the report can serve as a basis to promote possible cooperative action in this area, where possibilities for discussion include new international disciplines with appropriate flexibilities, soft law outcomes in the form of guidance for the design of subsidies, pledges or voluntary commitments, or enhanced transparency mechanisms.

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Executive Summary

Land-based agriculture provides the bulk of world food supply and is a critical source of feedstock, fuel, and livelihoods. Yet the sector, and more broadly the whole food system, is failing to deliver food and nutrition security for all. The sector also contributes both directly and indirectly to deforestation, soil and water pollution, biodiversity loss, and represents roughly 20% of global greenhouse gas emissions when counting both on-farm emissions and land use change. A key challenge for the agricultural sector over the coming years is to provide adequate healthy and nutritious food to feed an increasing population within the earth's planetary boundaries while responding to the rapidly changing diet of a growing middle class.

Achieving this will only be possible if economic, trade, and investment policies provide the right incentives and if governments cooperate across borders and supply chains. In this context, government subsidies to agriculture are a critical topic for attention given their influence on international production and consumption patterns and their impacts on all three dimensions of sustainable development—environmental, economic, and social.

Total estimates of support to agriculture range from $610–842 billion per year. Recent studies have shown that a significant part of agricultural support relies on policy instruments that not only distort production and trade but also tend to generate increased greenhouse emissions and other environmental damages. In particular, they point to market price support, payments based on output, and input subsidies as potentially more harmful than other types of support measures. At the same time they recognize that the environmental impact of a particular subsidy scheme is highly context specific and depends on a wide range of factors related to subsidy design and different agro-ecological conditions.

Further complicating the equation, subsidy programmes often involve trade-offs between different environmental objectives such as animal welfare or greenhouse gas emissions as well as broader public policy goals including rural development, employment and food or livelihood security for example. As a result, identifying ex ante the environmental effects of particular forms of support remains highly complex and subject to interpretation. This calls for more granularity and differentiated approaches to the identification of environmentally harmful subsidies.

As a contribution to efforts underway in different fora, TESS convened an international group of world leading experts on sustainable agriculture to help build shared understandings of what constitutes environmentally harmful agricultural subsidies. This report reflects that collective effort among the expert group members. It starts by reviewing the current state of knowledge on agricultural subsidies and their impacts on the environment and discusses trade-offs across different policy objectives. It then suggests possible approaches and pathways to building shared understandings of what could be defined as environmentally harmful subsidies as well as options for collaborative international approaches to address them.

The report identifies the following set of set of possible approaches that governments could use to refine collectively their understanding of what constitutes environmentally harmful agricultural subsidies. These options can be combined or used cumulatively and are not intended to be exhaustive:

- Focusing on producer support linked to production as the most trade distorting forms of support as well as the subsidies that are most likely to be environmentally harmful.
- Enhancing monitoring and transparency of the environmental impacts of agricultural support based on standardized reporting requirements as a way to develop shared understandings of the impacts associated with different support schemes.
- Differentiating support based on commodities or subsectors associated with particularly strong environmental footprints.
- Differentiating support based on farming practices or the production methods they incentivize. This could be done either by encouraging subsidies to environmentally friendly farming practices or by discouraging subsidies to environmentally harmful ones.
- Defining a core set of subsidies which would be deemed environmentally harmful unless the subsidizing country can demonstrate that the scheme in question does not result in environmental damages.
- Providing for effective special and differential treatment provisions in the form of longer transition periods as well as exemptions for (i) countries accounting for a negligible share of the negative global environmental impacts, (ii) small scale, low-income or resource poor producers, or (iii) countries at low levels of economic development so as to balance trade-offs between policy goals.

While achieving more sustainable agricultural systems will ultimately require approaches that go beyond subsidies, reforming environmentally harmful subsidies remains a necessary first step in this transition process. So far, however, progress has been slow and most efforts focus on the country level. While domestic action is ultimately key to removing such subsidies, these autonomous efforts would significantly benefit from cooperation at the international level to avoid a patchwork of uncoordinated and possibly conflicting initiatives. International discussions, including peer pressure, can play a key role in strengthening the case for subsidy reforms. Furthermore, cooperative approaches can avoid the free rider problem and alleviate concerns about the loss of competitiveness as a result of domestic subsidy reform.

Such cooperation would contribute to meeting international commitments and could be deployed in a variety of fora or processes, including in the WTO, OECD, G20, FAO, and World Bank and in regional initiatives. It could take a wide range of forms depending on what is realistically achievable in different contexts.

At the broadest level, sustainability considerations could be reflected in efforts aimed at developing new rules and enhanced disciplines on agricultural subsidies. Beyond new disciplines, international discussions could provide a space to facilitate exchanges on good practices and lessons learned from domestic reform, enabling countries to align their policies more closely with sustainability objectives while respecting diverse national circumstances. Enhanced transparency on the sustainability dimensions of domestic support schemes based on standardized reporting requirements and regular peer review could similarly lay the groundwork for concerted action. More advanced forms of cooperation could also include developing collective approaches such as guidelines for the design of subsidy schemes.

Abbreviations

ASCM	Agreement on Subsidies and Countervailing Measures
BIOFIN	Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
DPSIR	Driver-Pressure-State-Impact-Response
EHS	Environmentally Harmful Subsidies
FAO	Food and Agriculture Organization of the United Nations
GHG	Greenhouse Gas
IDB	Inter-American Development Bank
IFPRI	International Food Research Institute
IUCN	International Union for Conservation of Nature
MPS	Market Price Support
OECD	Organisation for Economic Co-operation and Development
PSE	Producer Support Estimate
R&D	Research and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WTO	World Trade Organization

1. Introduction

Land-based agriculture provides the bulk of world food supply and is a critical source of feedstock, fuel, and livelihoods. Yet the sector, and more broadly the whole food system, is failing to deliver food and nutrition security for all, as illustrated by the renewed increase in the number and share of hungry people observed in recent years. The sector also contributes both directly and indirectly to deforestation, soil and water pollution, and represents roughly 20% of global greenhouse gas (GHG) emissions when counting both on-farm emissions and land use change (Food and Agriculture Organization of the United Nations [FAO], n.d.-b)). Water extraction, invasive alien species, and crop, livestock, and plantation cultivation also affect biodiversity, with 34% of species on the International Union for Conservation of Nature (IUCN) Red List having agriculture documented as a threat. On the other hand, about 17% of Red List species rely on agriculture for their habitat (IUCN, 2024).[1] In the coming years, a central challenge for the agricultural sector is to provide adequate healthy and nutritious food to feed an increasing population within earth's planetary boundaries while responding to the rapidly changing diet of a growing middle class in urban areas. Meeting these goals will require raising agricultural productivity significantly and also ensuring more equitable access, availability, and stability of food supply while safeguarding livelihoods, protecting fragile ecosystems, restoring biodiversity, increasing soil productivity, rationalizing the use of water, and reducing GHG emissions.

Achieving this transformation will only be possible if economic, trade, and investment policies provide the right type of incentives and if governments cooperate across borders and supply chains. In this context, government subsidies to agriculture are a critical topic for attention given their influence on international production and consumption patterns and their impacts on the all three dimensions of sustainable development—environmental, economic, and social.

Total estimates of support to agriculture range from $610 billion per year[2] to $842 billion per year.[3] Out of the almost $540 billion spent annually on net support to individual producers in 88 countries between 2013 and 2018, the FAO, United Nations Development Programme (UNDP), and United Nations Environment Programme (UNEP) estimate that two-thirds can be considered price distorting and potentially harmful to the environment (FAO et al. 2021). Similarly, recent studies have shown that a significant part of agricultural support relies on policy instruments that are environmentally harmful and generate increased GHG emissions.[4] Such support remains highly concentrated among a handful of large producing countries and mostly benefit temperate products.[5] In this context, Gautam et al. (2022) estimate that repurposing a portion of government spending on agriculture each year away from subsidies to investment in developing and disseminating green innovations or technologies for crops and livestock that are both productivity-enhancing and emissions-efficient could reduce overall emissions from agriculture by more than 40%. Alongside, millions of hectares of land could be restored to natural habitats. Redirecting about $70 billion a year—equivalent to 1% of global agricultural output—would also yield a net benefit of over $2 trillion in 20 years according to Gautam et al. (2022).

On the global stage, the need to tackle the environmental impact of agricultural subsidies has been reaffirmed at the highest political level. The Kunming-Montreal Global Biodiversity Framework, adopted at the 2022 United Nations Biodiversity Conference (COP15) of the Convention on Biological Diversity (CBD), calls for addressing subsidies harmful to biodiversity, in a "proportionate, just, fair, effective and equitable way" and reducing them by at least $500 billion per year by 2030, starting with the most harmful incentives (Target 18, CBD, n.d.). At the 2024 United Nations

1 Established in 1964, the IUCN Red List of Threatened Species is the world's most comprehensive information source on the global extinction risk status of animal, fungus, and plant species.
2 Koplow and Steenblik (2024).
3 Organisation for Economic Co-operation and Development (OECD) (2024).
4 See for example Ash and Cox (2022) and Xu (2023).
5 According to the OEDC (2024), four economies—China, Japan, the European Union, and the United States—accounted for roughly 70% of all positive producer support over the past 20 years.

Biodiversity Conference (COP16), parties adopted a revised resource mobilization strategy for the period 2025–2030, which calls for effective international action in line with the framework's Target 18 in order to complement domestic action on incentives, including subsidies, harmful for biodiversity (CBD, 2025b). Parties also approved the monitoring framework for the Kunming-Montreal Global Biodiversity Framework and listed the "value of subsidies and other incentives harmful to biodiversity" as an indicator for Target 18 (CBD, 2025a).

In a similar vein, the Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action, signed by 159 heads of state at the 2023 United Nations Climate Change Conference (COP28) emphasizes the need to "revisit or reorient policies and public support" to tackle the issues associated with the food-climate nexus, along with scaling up all forms of finance and pursuing a fairer and transparent trading system. Finally, at the World Trade Organization (WTO), a broad range of members have expressed their determination to make progress towards promoting sustainable agriculture and food systems (WTO, 2023). Several have emphasized the need to address specifically the environmental sustainability aspects of subsidies. While existing trade rules encourage a shift towards forms of support that are deemed to be non—or at most minimally—trade distorting, including payments delinked from production under environmental payments, WTO rules are not designed to specifically constrain those that have negative environmental effects.

So far, discussions on environmentally harmful subsidies (EHS) have mostly focused on repurposing existing support to incentivize practices that minimize the negative impact of agriculture on the environment and help producers evolve towards more sustainable farming models. In most countries, the complete removal of agricultural subsidies remains politically infeasible given the potential impact on food self-sufficiency and farmer incomes. In this context, redirecting or repurposing subsidies towards the provision of public goods, sustainable practices, innovation, or research and development (R&D) is often a preferred path forward from a political, social, and environmental perspective. In practice, however, the notion of repurposing remains subject to many interpretations and as production and trade-distorting supports are progressively replaced by environmental payments, there are growing calls for stronger guidance on how to design and implement such schemes in a non-trade distorting manner.

In short, while domestic reform remains essential to reform EHS, such autonomous efforts would significantly benefit from cooperation at the international level. Coordinated and concerted global efforts will also be crucial to achieve the scale needed to reduce, halt, or reverse environmental damage and deliver benefits at the planetary scale. It will not only avoid a patchwork of uncoordinated initiatives, but also reduce the free rider problem and alleviate concerns about the loss of competitiveness. Regardless of where such cooperation takes place, a key prerequisite for collective action is the need to establish shared understandings of what constitutes environmentally harmful subsidies, including some kind of typology of EHS.

Existing literature mostly points to market price support, payments based on output, and input subsidies as potentially more environmentally harmful than other types of support measures (Henderson & Lankowski, 2019). However, the literature recognizes that the environmental impact of a particular subsidy scheme is highly context specific and depends on a wide range of factors related to subsidy design and different agro-ecological conditions. For example, fertilizers subsidies may result in environmental degradation but can also promote sustainable intensification and reduce pressure on deforestation in countries where production growth happens through expansion of the agricultural frontier. To further complicate the equation, individual programmes often involve trade-offs between different environmental objectives such as animal welfare and GHG emissions or broader public policy goals including rural development, employment, and food or livelihood security. In essence, identifying ex ante the environmental effect of particular forms of support remains highly complex and subject to interpretation. This calls for more granularity and differentiated approaches to refine existing knowledge.

2. Objective and Scope of the Report

As a contribution to efforts currently underway in different fora, the Forum on Trade, Environment, & the SDGs (TESS) convened an international group of world leading experts on sustainable agriculture from academia, think tanks, intergovernmental organizations, and stakeholder organizations representing a diversity of geographical origin and perspectives, participating in their personal capacities (see the Annex for the list of expert group members). The expert group was asked to contribute to building shared understandings of what constitutes environmentally harmful agricultural subsidies to inform ongoing discussions at the international level in the WTO, OECD, FAO, UNEP, World Bank, and in the context of the Kunming-Montreal Global Biodiversity Framework. It also served to foster exchanges between experts and organizations that are engaged in different ways in key processes or initiatives relevant to the reduction of EHS in agriculture.

Discussions were informed by inputs from group members—recognizing that a number of international experts and organizations are separately involved in different research efforts to identify and define such subsidies—as well as informal consultations with key delegations active on this issue in the WTO. This report reflects a collective effort among the expert group members to identify environmentally harmful agricultural subsidies and options to tackle them collectively. It starts by reviewing the current state of knowledge about agricultural subsidies and their impact on the environment. It then suggests possible approaches and pathways to develop a common understanding of what could be defined as environmentally harmful agricultural subsidies and collaborative international approaches to address them.

The expert group hopes that dialogue around the findings of this report can serve as a basis to promote possible cooperative action in this area, ranging from new international trade disciplines, with appropriate flexibilities, or soft law outcomes in the form of guidelines for the design of subsidies to new transparency requirements or voluntary commitments, depending on what is feasible.

3. Defining and Measuring Agricultural Subsidies

Economic support measures come in a wide variety of forms, including direct and indirect support payments, tax concessions to specific industries or regions, market price support, and other regulations that enhance the competitive position of particular industries or sectors. The definition enshrined in the WTO Agreement on Subsidies and Countervailing Measures (ASCM) considers that a subsidy is deemed to exist if (a) there is a financial contribution by a government or any public body or (b) there is any form of income or price support and (c) a benefit is thereby conferred. The types of financial contributions listed include direct transfers of funds (e.g. in the form of financial contributions, compensations, or support), revenue foregone (e.g. tax breaks or rebates of charges), and the provision of goods and services. While the ASCM definition was developed with a specific objective in mind, namely to address the trade and production distorting aspect of subsidies, it remains the only internationally agreed legal definition and provides the basis for many of the sectoral definitions used in other for a, including for reporting purposes under Target 18 of the Kunming-Montreal Global Biodiversity Framework.[6]

The OECD (2005) defines subsidies as "government measures that give consumers or producers an advantage in order to increase their income or reduce their costs." In the area of agriculture, the OECD has developed a methodological framework to measure and evaluate the impact of support measures, notably through the

6 For example, the European Commission (2024) refers to the WTO definition in its guidelines for identifying and reporting non-energy environmentally harmful subsidies.

producer support estimate (PSE). Contrary to the WTO, it does not refer to the term subsidies but uses the term "support to agriculture," reflecting the value of all government transfers to agricultural producers. Other than their terminology, the OECD and WTO definitions are very similar. The main difference relates to the treatment of market price support deriving from policies that support domestic prices at levels higher than international prices—or suppress them in the case of negative support. These may include barriers to trade such as tariffs, licenses, and quotas or export restrictions that raise or lower the domestic price relative to world prices. In practice such support measures have similar effects as subsidies, even if they do not have a fiscal cost to the government, are paid by consumers. With the exception of government purchase at administered prices, such trade policies are subject to separate disciplines in the WTO.

Beyond the WTO and OECD, other definitions also include implicit subsidies that result from the non-internalization of externalities or lack of full cost pricing. While including such uncorrected market failures may be relevant from an environmental perspective, in practice most of the literature tend to exclude them; not least because of the difficulty in putting a monetary value on such externalities. The literature also recognizes that a wider range of indirect processes or incentives, such as road construction projects, relocation policies, or property rights, can have similar effects as subsidies; for example on land use change with cascading effects on the environment (see Box 1).

Box 1. Land Property Rights and Incentives for Extensive Livestock Production: The Colombian Case

In Colombia, Law 161 of 1874 established that "any individual who occupies uncultivated land belonging to the nation, to which no special application has been given by law, and establishes habitation and cultivation therein, acquires the right of ownership over the land he cultivates, whatever its extension" (Novoa, 2021). According to recent analysis by the UNDP's Biodiversity Finance Initiative (BIOFIN), the adjudication of vacant land via property rights for more than 150 years has been one of the great engines of agricultural land expansion through the direct promotion of colonization (BIOFIN, 2023). The Colombian armed conflict that began in the 1950s found in these territories of the agricultural frontier and in the most jungle areas of the country the perfect place to settle. Land appropriation was constituted as the production factor for the establishment of pastures for cattle ranching (Novoa 2021). Today, based on cartographic results, the analysis shows a positive relationship between the increase in the number of farms incentivized by the land property regime and the expansion of the agricultural frontier in areas of special interest for biodiversity (BIOFIN, 2023).

Sources: BIOFIN (2023) and Novoa (2021).

Many international organizations provide assessments and measurements of agricultural support, notably WTO notifications of domestic support measures. The OECD also collects estimates of budgetary and price support for 54 countries through its PSE database. The Inter-American Development Bank (IDB) Agrimonitor database includes PSE data for 19 Latin American and Caribbean countries and for 57 commodities. Through its Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme, the FAO collects similar data for 16 countries in sub-Saharan Africa and one in South Asia. To facilitate the construction and dissemination of a comprehensive and long-term global dataset of support measures across commodities, countries, and time, the AgIncentives Consortium was formed in 2013 to bring together institutional efforts of the International Food Research Institute

(IFPRI), IDB, FAO, OECD, and World Bank. Following the OECD classification, the consortium's Nominal Rate of Assistance dataset includes data on: (i) market price support resulting from measures such as tariffs, quotas, trade bans, or export taxes; (ii) payments based on output; (iii) payments based on inputs; and (iv) payments based on other indicators such as factors of production and current or past area or livestock numbers. The AgIncentives website allows users to compare data on almost 90 countries and 70 products over 14 years accounting for 90% of global agricultural output (AgIncentives Consortium, 2024).

4. Linkages Between Agricultural Support and Environmental Impacts

The existing literature provides a large amount of information on the impacts of agricultural support on production, trade, and, more recently, the environment.[7] Overall, the conceptual pathways through which subsidies can affect the environment are well established. At the broadest level, subsidies change the economic incentives facing participants in the agricultural sector and ultimately influence the amount and type of agricultural goods produced, where they are produced, and the technologies employed to produce them. This in turn can significantly affect environmental outcomes. For example, certain forms of agricultural support can lead to the overuse of pesticides and fertilizers, or to the conversion of natural land into agricultural land. Similarly, agricultural support may influence cropping choices, tillage practices, crop rotations, or farm entry and exit decisions. On the other hand, subsidies can also be used to generate environmental benefits, such as payments to farmers to plant trees to reduce agricultural run-off or maintain ecosystems (OECD, 20025). Targeted support policies can also promote carbon storage, resilience to natural disasters, and preservation of rural landscapes.

Empirical analyses undertaken to assess the environmental impacts of subsidies—notably under the Kunming-Montreal Global Biodiversity Framework—have used a variety of approaches and methodologies (see Box 2). The OECD (2005) proposed a method using a checklist, which was expanded in subsequent years. More recently, the European Commission (2024) has developed a guidance document for reporting of non-energy environmentally harmful subsidies. The document creates a common basis to support member states in identifying EHS by setting out a methodology and structure for reporting, accompanied by examples of EHS in different sectors.[8] In a similar vein, UNDP's BIOFIN has developed step-by-step guidelines to examine, repurpose, and monitor subsidies to make them fiscally responsible and nature positive (UNDP, 2024). The guidelines aim to facilitate data collection on existing support measures, determine the extent to which they may be at risk of harming nature, and create plans to redesign them to become more nature positive.

While these approaches provide critical guidance to assess the impact of existing schemes on a case-by-case basis, they fall short of establishing a comprehensive typology of measures that can be considered ex ante as environmentally harmful. In the absence of such typology, policymakers essentially rely on theoretical analysis, applied modelling, or literature reviews.

7 See Ash and Cox (2022) for a detailed review of the literature on the environmental impacts of agricultural subsidies.
8 According to this guidance, a subsidy is considered environmentally harmful if it causes significant harm to one or more of the following environmental objectives: climate change mitigation; climate change adaptation; sustainable use and protection of water and marine resources; transition to a circular economy; pollution prevention and control; and protection and restoration of biodiversity and ecosystems.

Box 2. Subsidies Harmful to Biodiversity: A Review of Existing National-Level Assessments

Under Target 3 of the 2011–2020 Aichi Biodiversity Framework—the predecessor of the Kunming-Montreal Global Biodiversity Framework—parties to the CBD committed to eliminate, phase out, or reform incentives, including subsidies, harmful to biodiversity by 2020. Decision XII/3 of the Twelfth meeting of the Conference of the Parties to the CBD (COP12) in 2014 further called on parties to have finalized policy plans by 2018 to identify harmful incentives, provide a prioritized list of measures leading to their eventual elimination, phase-out, or reform, and set out associated timelines and milestones for implementation (CBD, 2014). In line with these commitments, several governments started identifying and assessing the types and magnitudes of existing incentives in place at the national level, which could potentially be harmful to the environment.

A recent OECD working paper reviews and compares existing national level studies undertaken so far (Matthews & Karousakis. 2022). Overall, 22 studies were identified, covering 11 European countries. Starting from a list of relevant direct and indirect subsidies usually provided by the ministry of finance or tax authorities, most studies screened those subsidies that were potentially harmful to the environment or biodiversity following a two-step approach. The first step consisted in identifying a set of sectors where environmental effects were most likely to be found (e.g. agriculture, water, and forestry). Subsidies within these sectors were then classified as potentially harmful, often based on applying the Driver-Pressure-State-Impact-Response (DPSIR) framework as recommended by the OECD. Some studies made use of expert groups to help with this classification. The second step consisted in assessing the extent of the damage to the environment or biodiversity arising from the subsidy. In most studies, this was a purely qualitative assessment, not least because establishing a quantitative causal relationship is extremely difficult given the multitude of factors intervening. A useful approach sometimes used was a "traffic light" system to indicate qualitatively the likely scale of impacts on the environment or biodiversity.

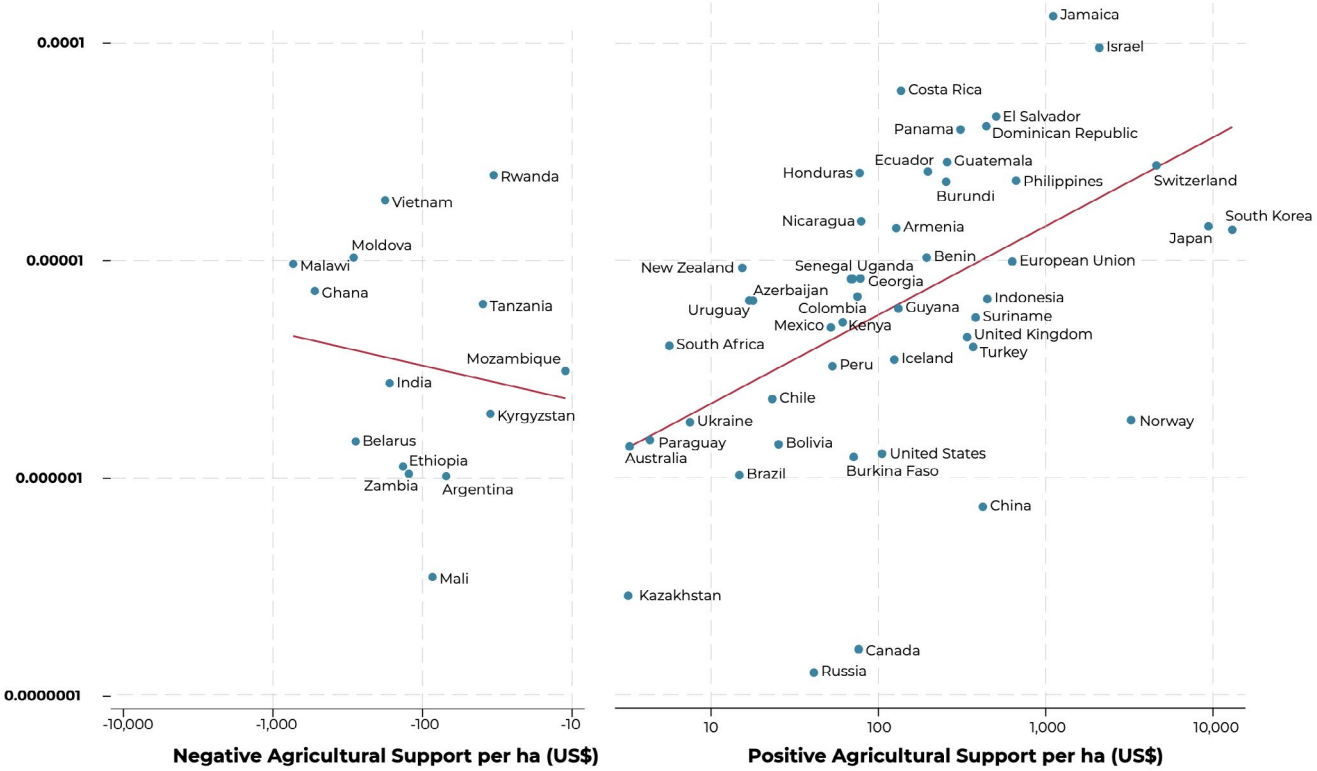
Source: Matthews and Karousakis (2022).

At the broadest level, recent analysis by the IUCN (2024) shows that the amount of agricultural support by country is positively correlated with the number of species threatened by agriculture, measured on a per hectare basis (see Figure 1). This finding does not imply causal links but highlights the potential opportunity to address species conservation goals through realignment of existing subsidies.

More specifically, the literature points to support measures linked to production, such as market price support, payments based on commodity output, or payments based on unconstrained variable input use such as pesticides or fertilizers, as potentially more environmentally harmful. This is because they provide incentives for the intensification of production and affect the allocation of land in the agricultural sector.[9] For example, support for the unconstrained use of variable inputs such as fertilizers, feed, and fuel can lead to increased nitrous oxide emissions, incentivize increased livestock production and related GHG and nitrogen emissions, or encourage carbon dioxide emissions from increased on-farm energy use (OECD, 2022). Such forms of support also tend to negatively influence biodiversity by promoting less diverse agricultural systems.[10]

9 See for example Henderson and Lankoski (2019), DeBoe (2020), and Mamun et al. (2021).
10 See for example Lankowski & Thiem (2020).

Figure 1. Number of Species Threatened By Agriculture, Per Hectare, and Amount of Agricultural Producer Support, Per Hectare of Agricultural Land (Average 2016–2020)



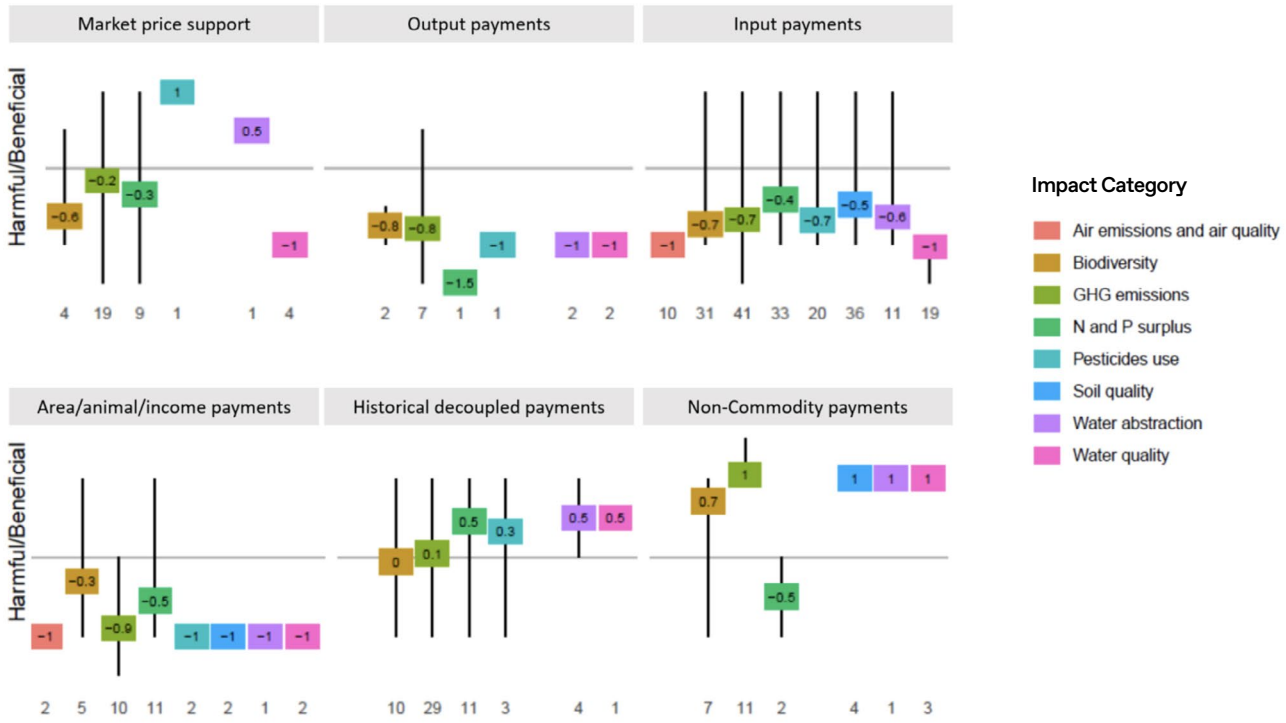
Source: IUCN (2024).

Other than input and output subsidies, partly decoupled payments linked to area cultivated, animal, or income can also be associated with negative environmental impacts even if they tend to be less production and trade distorting. Finally, decoupled payments based on historical entitlements without production requirements and payment based on non-commodity outputs (e.g. land retirement, wetlands, or buffer strips) tend to be neutral or potentially beneficial from an environmental perspective. Figure 2 provides a summary of a literature review undertaken by the OECD based on 85 papers with 607 observations assessing the impact of different forms of support on a range of environmental variables.

Beyond these broad considerations, however, the literature emphasizes that the actual environmental impacts of particular agricultural support measures are highly context specific and depend on a wider range of factors, making it difficult to assess ex ante the scale, scope, and severity of environmental impacts associated with different types of support. Such factors include differences in the amount and duration of the support measure, behavioural responses to economic incentives, differences in policy design (e.g. the inclusion or not of environmental cross compliance requirements), and also location-specific physical factors including landscape characteristics and agro-ecological conditions.

Finally, as supply chains become more globalized, the impact of particular support measures may vary across borders. To the extent that environmental measures reduce local production and raise prices, they may inadvertently incentivize the expansion of harmful production by actors in third countries—a phenomenon known as market leakage. For example, where agricultural support is provided to farmers in a country with relatively high

Figure 2. Beneficial (Positive) or Harmful (Negative) Impact Score on the Environment Per Type of Policy Instrument



Note: the numbers at the bottom refer to the number of studies.

Source: Lankoski et al. (2025).

environmental standards—whether because of high production efficiency, leading for example to lower emissions intensity of production, or a high regulatory baseline—in the absence of effective regulation on land use change, removing this support may lead to production increasing in other countries with even greater environmental harms.

A similar impact may result from the removal of certain support measures such as market price support (MPS) albeit through a different mechanism. While most modelling studies find that removing MPS will result in a decrease in GHG emissions associated with agricultural production at the national level, when looking at global impacts, several modelling exercises find negative impacts on GHG emissions (i.e. an increase in emissions) associated with reductions in such support (see Table 1 for an illustrative set of studies that reach this latter result). This is because removing MPS tends to lower prices in protecting countries; this raises demand, which, in turn, can lead to greater environmental harm. Incidentally, this outcome may be expected even if the level of environmental standards is the same across countries. More generally, with freer trade, global emissions could rise simply because of higher total demand even if production moves to more efficient producers. The same effects could arguably occur on biodiversity even though this has not been fully documented yet in the literature, partly due to the lack of common metrics to measure such impacts. It should be noted, however, that these are small net effects at the margin, which could occur in the absence of land use change regulations.

In summary, beyond the general recognition that agricultural subsidies linked to production and targeting individual farmers—as opposed to the sector as a whole—are likely to be more environmentally harmful, defining ex ante what constitutes EHS requires additional layers of analysis.

Table 1. Findings in the Modelling Literature on Impacts on Global GHG Emissions of Removing Market Price Support

Authors (year)	Model Used	Sources of Emissions Covered	GHG Emissions Change When Removing MPS
Fell et al. (2022)	GTEM (CGE)	Agricultural and food production	Increase
Gautam et al. (2022)	MIRAGRODEP (CGE)	Agriculture production Land use change	Increase
Glauber and Laborde (2023)	MIRAGRODEP (CGE)	Agriculture production Land use change	Neutral
Guerrero et al. (2024)	GLOBIOM (PE)	Agriculture production Land use change	Increase
FAO, UNDP, UNEP (2021)	MIRAGRODEP (CGE)	Agriculture production Land use change SOC balance	Decrease
Laborde et al. (2021)	MIRAGRODEP (CGE)	Agriculture production	Increase

Source: Authors' elaboration.

5. Towards More Granularity in the Identification of Environmentally Harmful Agricultural Subsidies

This section reviews existing initiatives and approaches which attempt to overcome the challenges highlighted above in defining environmentally harmful agricultural subsidies. A precedent in this respect is the WTO Agreement on Fisheries Subsidies, which crafts specific disciplines to address the sustainability impacts of subsidies. While the environmental issues affecting fisheries are arguably different from those affecting agriculture—even if concerns around water, climate, or biodiversity have similarities with the common good problem prevailing in the fisheries sector—these negotiations still provide useful insights on how to identify ex ante a range of subsidies that should be reformed based on their impact on sustainability. Reflecting on the experience so far, Box 3 highlights some of the key lessons learned in this process.

Another promising approach, more closely related to agriculture, is that developed by the European Union with the use of meta-analyses assessing the environmental impacts of different agricultural practices supported by the Common Agricultural Policy. Such analyses helps repurpose agricultural support towards environmentally beneficial farming practices. Finally, several studies have been using DPSIR models, identifying key drivers of environmental degradation and associating them with particular farming practices (Matthews & Karousakis, 2022). This framework can be used to identify practices or particular circumstances, which should not be further incentivized through the use of subsidies. The following subsections describe these two approaches in greater detail and review the pros and cons associated with them.

A common feature among all of these approaches is that they not only consider the type of support being provided but also the type of production practices being incentivized and the specific conditions prevailing in the sector. This stems from the realization that a particular subsidy scheme will have different environmental impacts depending not only on the nature and scale of support provided or the risk preferences of farmers, but also on the sector itself, the farming practices employed, or the specific environmental vulnerabilities prevailing in the country.

Box 3. The Fisheries Subsidies Precedent

To meet growing legislative demand for coherent and robust circularity metrics as well as transparent reporting, several circularity frameworks, metrics, standards, and tools have emerged in recent years. Circular economy standards can be broadly divided into two categories: (i) those standardizing circular organizational and management approaches, such as implementing product-service systems, procurement, reporting, and ecodesign (examples include the UK's BS8001, France's Pr XP X30-901, ISO/TC 323, and the European Sustainability Reporting Standards - E5 standard); and (ii) those standardizing product circularity, such as phasing out hazardous material content and toxics and increasing material quality, recyclability, repairability, and performance of second-hand or remanufactured goods, as well as sustainable production requirements.

From a trade perspective, product standards are particularly relevant. They can be grouped into two broad categories along the product value chain. The first group targets upstream value chains for product design and production, such as material content standards, recycled content standards, hazardous content standards, recyclability standards, reparability standards, and sustainable production standards. The second group targets downstream value chains, including material quality standards for secondary raw materials and product quality standards for refurbished, remanufactured, and second-hand goods. Examples include standards for recycling and waste-handling (e-stewards, R2 Standards, WEEELABEX) and refurbishment and remanufacturing (FIRA/REMAN001: 2019, IEC TC 111, ANSI RIC001.1-2016 and BS 8887–220: 2010), as well as product-specific standards (such as the BSI PAS 141:2011 for used electrical and electronic goods).

In parallel with the development of circular standards, other standards for supply chain traceability and transparency have been produced or are under development. Examples include the GS1 Global Traceability Standard (GTS2), PR3's standard for reusable packaging, United Nations Economic Commission for Europe (UNECE) traceability standards for sustainable garments and footwear, or the circularity.ID Open Data Standard for fashion. The combination of the evolving policy landscape requiring greater levels of supply chain traceability—alongside the metric, protocols and standards developments outlined above—will play an important role in helping to address the key traceability and transparency challenges facing circular trade. If transparency and traceability are to be realized across whole value chains, they must therefore also be accompanied by an extensive capacity building programme to provide dedicated support to those who may incur disproportionate burdens and costs to adapt and comply (such as MSMEs in low-income countries) and to ensure the transition is inclusive.

For example, the use of coupled subsidies can be particularly damaging for the environment if it encourages the use of emissions-intensive practices or technologies or if it applies to a sector where the GHG emissions per unit of output is particularly high such as ruminant livestock.[11] Similarly, there may be a case for prioritizing reform of production-enhancing subsidies that incentivize the unconstrained expansion of agricultural land in vulnerable ecosystems or the use of water resources where water tables are already depleted. Alternatively, policymakers may want to repurpose subsidies to incentivize sustainable land use management practices, promote the use of renewable energy or the adoption of greener and more efficient fuels to power agricultural machinery.

11 Not only is enteric fermentation from ruminant livestock responsible for the largest individual commodity share of emissions, it is by far the most emissions-intensive segment of the sector and also receives the highest share of commodity-specific support. As a result, it has the highest implicit carbon subsidy attached to its production of all the agricultural commodities.

5.1 Meta-Analysis of the Environmental Impacts of Different Agricultural Practices

In the context of ongoing reform of the EU Common Agricultural Policy, the European Commission Joint Research Centre commissioned by the Directorate-General for Agriculture and Rural Development undertook a review of 570 published meta-analyses on the positive environmental and climate impacts associated with a range of different farming practices.[12] The results are synthesized in 250 files accessible online on a public home page (European Commission, n.d.-a) and dataset (European Commission, n.d.-b). Overall, based on the existing literature, the project documents the link between 34 different types of environmental impacts ranging from air and soil pollution through water quality to animal welfare, and the same number of standardized farming practices. It includes a classification and description of the different farming practices covered as well as the way in which they relate to climate and the environment.

Table 2 provides an overview of the positive environmental effects identified in this synthesis for each of these farming practices. It highlights, for example, the environmental benefits in terms of carbon sequestration, GHG emissions reduction, nutrient leaching and run-off or soil quality associated with organic farming systems, grassland management or soil cover practices such as cover and catch crops, leguminous crops, and mulching. In the subsidy discussion, such a meta-analysis review could help identify safe harbour subsidies or support measures that would in principle be deemed positive because they tend to incentivize environmentally beneficial farming practices.

A particular challenge, however, relates to the fact that the same practice may imply trade-offs between different environmental objectives. For example, some conservation or agri-environmental practices can have mixed effects on water quality and quantity. While no till can help reduce soil erosion and associated sediment in surface waters, it can lead to increased use of pesticides and nitrate leaching.[13] Similarly, while cover crops can reduce nitrate leaching they can have negative effects on groundwater recharge.[14]

It is also important to distinguish between the immediate outcomes or direct environmental impacts associated with specific practices and the total net effects. Specifically, a large number of studies point to trade-offs in terms of yield declines, which would result in area expansion and a reduction or reversal of the environmental benefits. The effect of various practices can also be attenuated or even reversed due to threshold effects or unintended consequences. In the case of land retirement programmes, for example, there is evidence that offsetting effects, generally known in the literature as slippage or leakage effects, can cause significant shifts in crop or livestock production patterns.[15] Along the same line, policy-induced changes in crop rotation can result in spillage effects. A recent study found that converting England and Wales to full organic production could result in very large land use changes in the rest of the world to compensate for the reduction in domestic production if the shift to organic is not accompanied by changes in consumption patterns (Smith et al., 2019). As a result, the transition to organic could lead to net increases in GHG emissions, depending on the characteristics of the indirect land use change needed to meet the country-specific food demand. Finally, as highlighted in section 6 below, trade-offs to consider should also include other public policy objectives such as poverty, food security, or nutrition in addition to the environmental impacts.

12 A meta-analysis is a systematic statistical synthesis of the results of many independent individual experiments.
13 See for example Bhattacharyya et al. (2022).
14 See for example Blanchy et al. (2023) and Abdalla et al. (2019).
15 Slippage can come from the reduction in output from the retired land that causes a supply shortage, leading to an increase in the output price, which in turn provides incentives to increase production.

Table 2. Positive Environmental Impacts Associated With Selected Farming Practices

Farming Practices	Agroforestry	Organic farming systems	Conservation farming systems	Crop residue management	Cover and catch crops	Fallowing	Mulching	Landscape features	Leguminous crops	No tillage and reduced tillage	Pesticide reduction strategies	Crop rotation	Intercropping	No irrigation	Water-saving irrigation practices in flooded lands	Water-saving irrigation practices in non-flooded lands	Organic Fertilisation	Green manure	Enhanced-efficiency fertilisers	Low-ammonia emission techniques for mineral fertilisation	Soil amendment with biochar	Soil amendment with lime and gypsum	Grassland management	Grassland conservation and restoration	Grazing management	Livestock feeding techniques	Livestock housing techniques	Manure storage techniques	Manure processing techniques	Manure land application techniques	Wetland management	Wetland conservation and restoration	Peatland management	Peatland conservation and restoration	Number of farming practices per impact
Positive Environmental Impacts	Farming systems			Soil cover								Crop diversification		Water management			Fertilisation strategies				Soil amendments		Grassland			Livestock					Wetland and peatland				
Acidification (LCA)		■																									■							2
Air pollutants emissions		■												■									■				■	■	■	■				16
Anti-microbial resistance																											■							1
Biodiversity		■				■	■	■		■	■													■	■						■	■	■	13
Carbon sequestration		■				■	■	■		■	■	■			■			■				■						■						25
Ecotoxicity (LCA)																											■							4
Energy use (LCA)		■																									■							3
Eutrophication (LCA)		■																									■							2
GHG emissions		■			■		■			■	■		■		■	■				■		■		■	■		■	■	■	■	■	■	■	30
Global warming potential (LCA)		■								■	■		■		■							■						■						9
Heavy metal pollution																						■					■							3
Land use (LCA)		■																									■							2
Nitrogen footprint (LCA)							■																				■							1
Nutrient leaching and run-off		■			■		■	■							■	■				■		■		■	■		■	■	■	■	■	■	■	20
Nutrient excretions																											■							1
Nutrients recovery																											■							1
Odour emissions																											■							1
Pesticide use											■																■							1
Pests and diseases		■			■			■			■	■	■					■						■										15
Plant nutrient uptake							■	■		■			■			■				■		■												14
Plastic residue							■																				■							1
Pollination		■			■			■																			■							5
Resource depletion																											■							1
Soil biological quality		■					■	■		■			■					■				■		■							■			17
Soil erosion		■											■														■							10
Soil nutrients		■						■		■			■	■								■		■										20
Soil physico-chemical quality		■						■		■						■						■												9
Soil water retention		■						■					■	■								■		■										13
Water footprint (LCA)								■								■																		2
Water quality									■																									2
Water use		■			■		■		■	■						■																		10
Animal production								■	■																									5
Crop yield		■			■		■	■	■	■	■																							24
Grassland production		■						■	■	■	■																							7
Number impact per farming practices	11	14	5	13	14	3	16	13	14	10	4	7	7	8	8	9	8	7	7	5	13	9	14	5	10	11	8	4	3	14	17	5	6	9	4	290
Number of meta-analysis included per farming practice	33	30	6	42	39	4	41	34	73	52	10	17	25	14	13	26	33	13	26	5	41	7	35	10	31	30	13	14	17	12	8	15	5	6	2	570

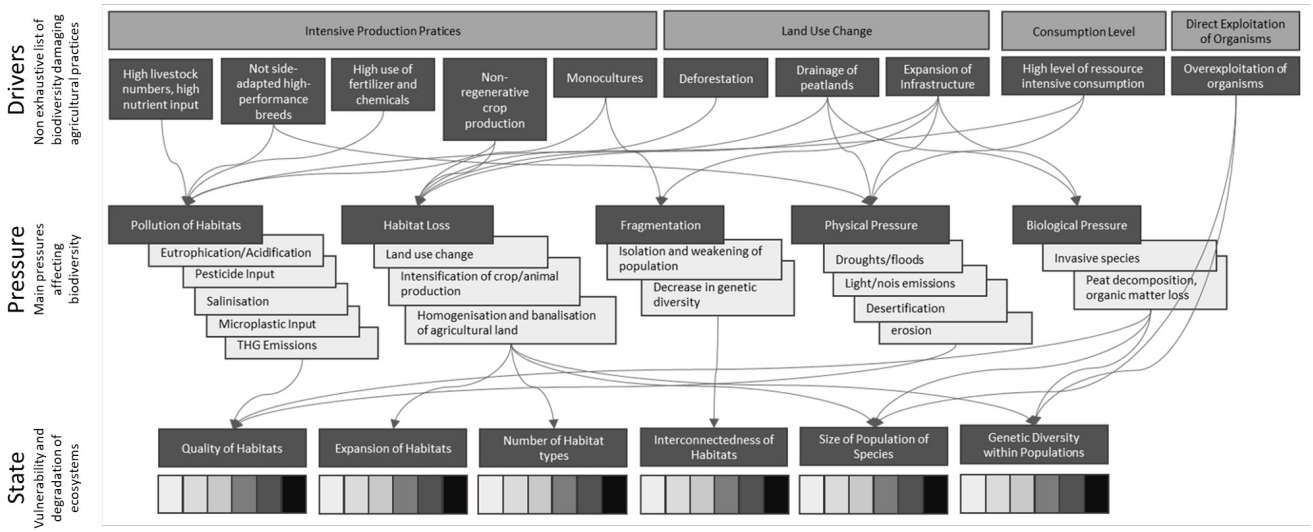
Source: iMAP-FP dataset (European Commission, n.d.-b).

5.2 Driver-Pressure-State-Impact-Response (DPSIR) Approaches

Another approach consists in identifying farming practices and particular circumstances where incentivizing production will result in environmental damages as opposed to those generating environmental benefits.[16] This can be done using a reduced DPSIR framework.[17] The DPSIR framework assumes a chain of causal links starting with "driving forces" through "pressures" to "states" and "impacts" on ecosystems, human health, and functions. Such an approach has been used, for example, to identify subsidies harmful to biodiversity (Gubler at al., 2020). It starts by singling out the main pressures on biodiversity and the key drivers behind them. Where the drivers are further incentivized through the use of subsidies, such support is considered as biodiversity damaging subsidies.

To illustrate this point, Figure 3 provides a non-exhaustive list of drivers of biodiversity loss in the form of specific agricultural practices or production methods. It highlights, for example, the role of intensive livestock farming based on external feed or of large-scale mono-cropping and non-regenerative crop production methods as drivers of biodiversity loss. These drivers impose different types of physical and biological pressures on the environment. By linking specific agricultural practices to drivers of biodiversity loss, this approach enables the identification of practices that should not be incentivized through the use of subsidies as they further intensify pressures on biodiversity.

Figure 3. Drivers, Pressures, and States Affecting Biodiversity



Source: Gubler (2024).

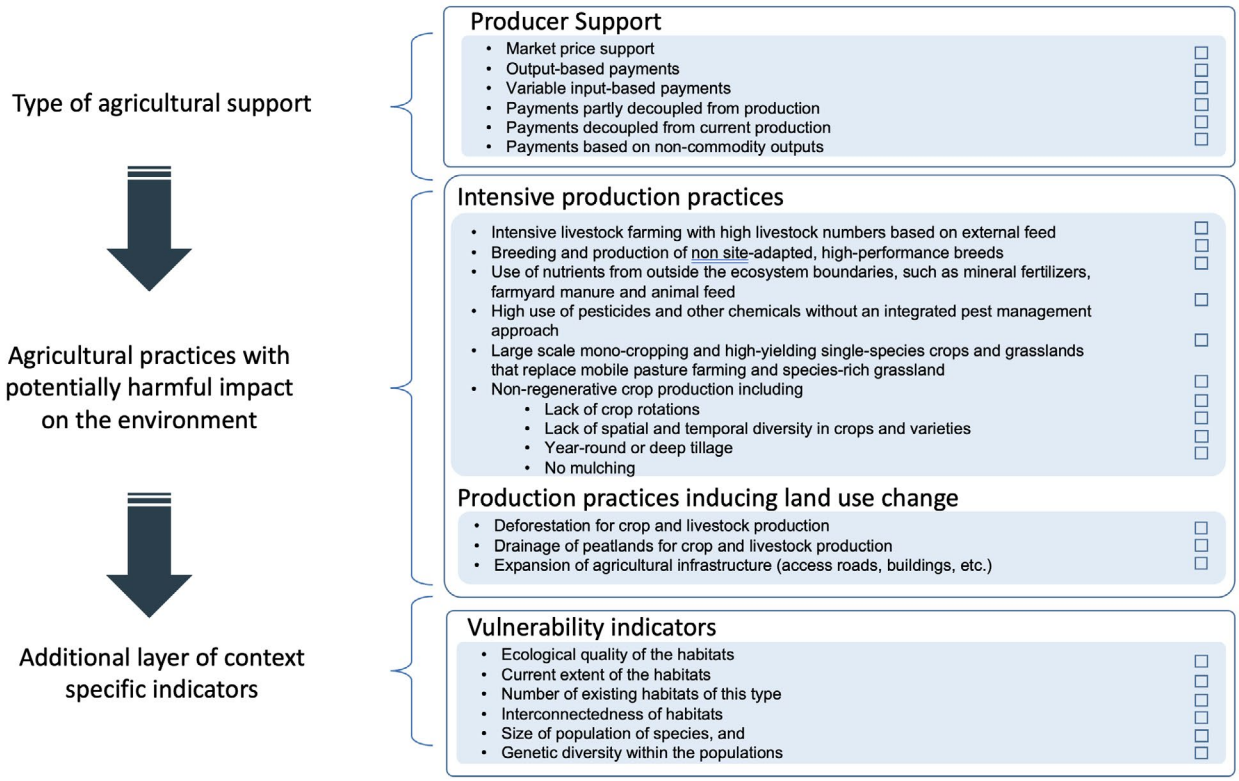
Given that the impact of these pressures depends on the vulnerability and degree of degradation of affected ecosystems, the approach usually considers an additional layer of analysis reflecting the particular situations or region-specific vulnerabilities that tend to exacerbate the potentially negative impact of the different drivers. For example, the impact of additional pressure will be greater if existing habitats are already degraded, fragmented, or of a unique type.

When applied to subsidies, this approach helps identify where particular restraint could be applied in case of vulnerable ecosystems or ecosystems already facing high pressure. Adding this layer of analysis also enables a differentiation

16 This section builds extensively on analysis by Lena Gubler and on Gubler et al. (2020).
17 The DPSIR framework provides a structure to present the indicators needed to enable feedback to policymakers on environmental quality and the resulting impact of the political choices made, or to be made in the future (FAO, n.d.-a).

between cases where support incentivizing particular agriculture practices result in different environmental effects as a result of flanking policies. Figure 4 summarizes the different steps and layers of analysis under this approach, starting with the type of support being provided, followed by the agricultural practices which can act as drivers of biodiversity loss, and ending with a set of vulnerability indicators that may indicate the presence of aggravating factors.

Figure 4. Criteria for Identifying Agricultural Subsidies Harmful for Biodiversity



Source: Authors' elaboration based on Gubler (2024).

A particular challenge associated with this approach is the need for objective indicators, which may not always be readily available. While this might be relatively straightforward in the case of GHG emissions, it could be more complex when dealing with other environmental challenges such as biodiversity loss, water scarcity, or soil pollution. For an approximation of region-specific vulnerabilities and pressures, several databases already provide critical data that can be taken into account. For example, the statistical evaluation of the FAO (n.d.-d) State of Food and Agriculture report lists environmental hidden costs of the agri-food system including, among others: fertilizer production and energy use; blue water use; land-use change at farm level; and nitrogen emissions at primary production level and from sewerage. FAO (n.d.-c) provides data on pressure from the use of fertilizer, pesticides, and other chemicals. The vulnerability of ecosystems, ecosystem services, and species populations on a global level are described in the IPBES (2019) Global Assessment Report on Biodiversity and Ecosystem Services, while The Global Peatlands Assessment by UNEP (2022) shows the vulnerability of wetlands.

In this context, the System of Environmental-Economic Accounting developed under the auspices of the United Nations Statistical Commission should also be mentioned. The system provides a statistical framework

containing an internationally agreed set of standard concepts, definitions, classifications, or accounting rules and tables to produce internationally comparable statistics and facilitate better-informed decision-making. It encourages national statistical agencies to measure environmentally harmful subsidies as part of domestic efforts to develop environmental national accounts monitoring pressures exerted by the economy on the environment (United Nations, n.d.).

6. Addressing Trade-Offs Across Different Policy Objectives

Reducing the agricultural sector's environmental impact is an increasingly important area of focus for policymakers in light of the current multiple crises of climate change, pollution, soil degradation, water over-abstraction, and biodiversity loss. However, environmental policies can come into conflict with other policy objectives also high on the economic and social agenda. The potential trade-offs between objectives are increasingly recognized in policy discussions. The OECD (2021), for example, refers to the "triple challenge" affecting food systems when analysing trade-offs between food security and nutrition, livelihoods, and environmental sustainability.

A clear example is that of ruminant livestock. These animals are a major source of GHG and nitrogen emissions in the agricultural sector and have by far the highest emissions intensities among agricultural products. The number of livestock is increasing globally and the sector is the largest user of land worldwide, with an estimated third of the world's surface used for grazing and feed production. At the same time, ruminant livestock play an important role in food security and nutrition, with one-third of global protein intake and nearly 20% of calories coming from animal sources, mostly ruminants. While excessive meat consumption in certain regions of the world is detrimental to public health, livestock production remains key for the livelihoods of a large proportion of the world's population and for the economic development and export opportunities of many countries.

As a response to growing demand for animal protein, livestock production in most industrialized countries largely occurs in confined animal feeding operations, and these systems are becoming more predominant. While this may result in more efficient production, including lower GHG emissions per unit of output, confined livestock production has direct impacts on water quality because the concentration of livestock often results in manure being treated as a waste product rather than a substitute for artificial fertilizer. These production practices also are responsible for antibiotics, heavy metals, and hormones being released in streams, lakes, and ground waters. Confined livestock production can further have substantial impacts on water quantity due to the high feed requirements of more confined operations and the water required to produce in water-constrained environments.

Reducing livestock numbers will reduce GHG emissions but can also lower protein availability and reduce farm incomes. Demand-side policies that encourage shifts towards lower emission intensity diets (i.e. with less meat consumption) can have potential co-benefits for public health but may also pose a threat to farmers living from livestock production. While such trade-offs are not inevitable in light of existing options and available technologies (e.g. for herd grazing or management practices), this illustrates the difficulty of meeting the triple challenge of concurrently guaranteeing livelihood, food security, and environmental sustainability.

A second example is that of the intensification of cropland. The increased use of inputs such as nitrogen, phosphorus and potassium fertilizers, pesticides, and irrigated cropland has dramatically enhanced cropland

yields around the world, with benefits for food security, incomes, and livelihoods. Intensification can also reduce the pressure on land use change and deforestation. Yet, synthetic fertilizers are responsible for around 7% of the agricultural sector's global GHG emissions (FAO, n.d.-b). They have also caused significant water pollution and thus biodiversity loss across the planet, as highlighted in a recent study identifying four nitrogen fertilizer hotspots: the Yangtze River basin in Central China, the Punjab in India, the Mississippi River Basin in the United States, and the Baltic Sea (Singh & Craswell, 2021).

These trade-offs lie at the heart of current debates around repurposing agricultural subsidies. First, the differing premise underpinning these contemporary debates is that the complete removal of agricultural subsidies is politically difficult and will inevitably benefit some sections of society and make others worse off; as demonstrated by farm protests across Europe and the reversal of reforms in India and of long-standing and acclaimed reforms in Mexico. Second, subsidy reform may have adverse impacts on food security in a number of regions. Third, it may result in limited environmental benefits if production declines resulting from reform are offset by production increases in countries with less stringent environmental requirements, or if it leads to an intensification effect whereby the sector compensates for falling income due to subsidy removal by increasing productivity. In this context, redirecting or repurposing subsidies towards sustainable practices, innovation, or R&D is often posited as a more effective reform path from a political, social, and environmental perspective.

7. Building Shared Understandings of What Constitutes Environmentally Harmful Agricultural Subsidies

Based on the considerations highlighted above, this section summarizes a set of possible approaches that governments could use to further refine collectively their understanding of what constitutes environmentally harmful agricultural subsidies. The list does not intend to be exhaustive but rather proposes a menu of different options that can be combined or used cumulatively to define EHS.

7.1 Focusing on Producer Support Linked to Production

As discussed in section 4, the existing research identifies the majority of support measures going directly to producers as potentially more harmful to the environment compared with general services like R&D payments, extension services that target the sector as whole, or support targeting consumers such as school feeding programmes. Among budgetary producer support measures, those directly and unconditionally linked to production are especially likely to affect the environment. This mostly includes payments based on commodity outputs or on unrestricted variable inputs such as fuel, pesticides, or fertilizers as well as market price support. In the WTO these payments essentially fall under the amber box category. They create the strongest price incentives to increase production and promote the use of additional inputs with potentially harmful effects on the environment. Partly decoupled payments linked to area cultivated, animal, or income can also be associated with negative environmental impacts even if they tend to be less production and trade distorting. Similarly, subsidies for food processing and sales promotion have somewhat less direct effect but can ultimately stimulate demand and production. Finally, decoupled payments without production requirements and payments based on non-commodity outputs such as payments for land retirement, wetlands, or buffer strips tend to be neutral or potentially beneficial from an environmental perspective.

The fact that production-enhancing subsidies tend to be the most environmentally harmful provides an additional rationale for reforming trade distorting domestic support. Several governments and observers have argued that removing or repurposing these forms of support would already go a long way in addressing the negative environmental effects of agricultural subsidies (Fell et al., 2022). As discussed earlier, however, the actual environmental impact of agricultural support measures tends to be highly context specific and depends on a wide range of factors. In other words, not all support measures under the categories highlighted above are necessarily environmentally harmful. Conversely, measures not falling under these categories may also have negative environmental effects. Tackling specifically and directly the environmental impacts of agricultural subsidies therefore requires a complementary approach to that targeting merely their production and trade distorting nature.

Finally, there is always the risk that removing trade-distorting subsidies may increase the global stock of environmental harm if it results in production moving to countries where adverse environmental impacts of agricultural production are even higher. As noted earlier, trade distortions—including high protection of livestock products—actually suppresses demand. From a purely environmental perspective, removing such distortions may increase trade and result in higher global production; even as the removal of these distortions leads to concentration in countries with higher productivity levels where emissions intensities tend to be lower.

7.2 Monitoring and Transparency as a Way to Gather Further Insights

Enhanced monitoring of the environmental impacts of agricultural support combined with standardized reporting requirements can help refine further shared understandings of what constitutes EHS. Regular review of the sustainability dimension of domestic support measures would not only improve transparency but could also play a critical role in ensuring that flanking measures or cross compliance requirements are effective. This would require regular notification of the environmental performances of production processes benefiting from the granting of subsidies. For environmental payments, notifications should also include the stated environmental objectives and information regarding progress in advancing those objectives. While such a process would basically entail an ex post analysis of existing schemes, it could play a critical role in adjusting programmes over time and ultimately enhance common understanding of the impact associated with different support schemes. At the same time, this would provide a vital space for countries to share domestic experiences, lessons learned, and best practices.

7.3 Differentiating Support Based on Commodities or Subsectors

A step further in trying to define environmentally harmful agricultural subsidies could consist in an approach that focuses on commodities or subsectors associated with particularly strong environmental footprints. From a climate change perspective, for example, the most emissions-intensive commodities—defined as the GHG emissions within the farm gate per unit weight of product (i.e. carbon dioxide equivalent per kilogramme)—should arguably be prioritized for reform. This would apply particularly to ruminant livestock, which are responsible for the largest share of total agricultural emissions as well as the sector's most emissions-intensive commodities and receive the highest share of commodity-specific support. All this contributes to ruminant livestock having the highest implicit carbon subsidy attached to its production. Similarly, other commodities or practices such as monoculture cropping may be singled out as associated with other environmental challenges such as biodiversity loss or water scarcity.

A limitation of such an approach, however, is that it does not reflect the wide differences in emissions intensities across regions and over time. For example, improvements in production technologies have generally reduced the GHG emissions intensities of agricultural production by more effectively targeting fertilizer, pesticide, energy, and water use. Whether agricultural systems depend on rain-fed or irrigated water supply is also key, as are the soil structures in different regions and within countries. This heterogeneity reflects significant variations in natural resource endowments, the diffusion of modern technology and farm practices, and also policy settings, stages of socio-economic and political development, and the prevailing trade regimes. Looking at commodities as a homogeneous sector would fail to capture these critical nuances.

7.4 Differentiating Support Based on Farming Practices

A third and possibly more promising avenue consists in taking into consideration the types of farming practices or production methods incentivized through the granting of support measures. As described in section 5, this could be done either by distinguishing farming practices associated with positive environmental impacts or by listing those linked to environmental degradation.

7.4.1 Encouraging Subsidies to Environmentally Friendly Farming Practices

Under this first option, governments could develop shared understandings of a circumscribed set of farming practices that are mostly associated with environmental benefits. This list could build on, and further refine, the 34 farming practices described in the review of 570 published meta-analyses undertaken by the European Commission Joint Research Centre (see Table 2 above). Domestic support granted to producers applying these farming practices could be deemed environmentally friendly and exempt from action aimed at reforming EHS. Such an approach would help overcome some of the limitations of a commodity-based approach but would need to be grounded in sound scientific evidence. It would also be subject to the limitations described in section 5.1, including the fact that the same practice may have different impacts under different agro-ecological conditions, imply trade-offs between different environmental objectives, and be subject to threshold or slippage effects attenuating or even reversing the environmental benefits. For these reasons, the challenge of reaching a broad-based consensus on a core set of environmentally beneficial farming practices should not be underestimated.

7.4.2 Discouraging Subsidies to Environmentally Harmful Farming Practices

The opposite approach would consist in defining farming practices that tend to be most associated with environmental degradation and discouraging the granting of subsidies to producers applying them. Not applying such practices should even be a pre-condition for receiving support.[18] The list could simply mirror that of environmentally friendly practices referred to above and be defined as the absence, or the opposite, of such practices. Section 5.2 provides some examples of practices associated with well-known drivers of biodiversity loss, including the use of pesticides and other chemicals without an integrated pest management approach, large scale monocropping or non-regenerative crop production, or practices associated with land use change such as deforestation or peatland drainage for livestock or crop production. Using the DPSIR framework described in section 5.2, practices closely associated with drivers of other types of environmental degradation could be identified based on the scientific literature.

18 This could follow a similar approach to the European Maritime Fisheries Fund procedure regulating the granting of European Union fisheries subsidies, which states that an application for support is inadmissible for a certain period if the operator has been involved in the ownership, management, or operation of fishing vessels found to have engaged in illegal, unreported, and unregulated fishing.

Given that the impact of these farming practices depends on the vulnerability and degree of degradation of ecosystems, the approach should also consider a range of environmental indicators reflecting such vulnerabilities and the current state of targeted ecosystems. The combination of certain forms of support incentivizing potentially harmful environmental practices in situations where domestic ecosystems are vulnerable would trigger particular constraints from the subsidizing country.

A particular challenge associated with this approach is the need to establish shared understandings of what could be considered as environmentally harmful farming practices, inputs, or technologies, with the risk of ending with the lowest common denominator. A second difficulty is the need for objective environmental indicators, which may not always be readily available, particularly in developing countries.

7.5 The Notion of a Rebuttable Presumption

A practical approach to complement or deal with the limitations highlighted in previous options could be to define a core set of subsidies, which would be deemed environmentally harmful unless the subsidizing country or economy can demonstrate that the scheme in question does not result in environmental damages. This approach would essentially reverse the burden of proof by ensuring that the responsibility of showing the absence of harmful effects falls on the country granting the subsidy.[19] The main advantage of this approach is that it would provide a pragmatic response to the very context specific impact of environmentally harmful agricultural subsidises. It would take into account particular design elements, flanking measures, or cross compliance requirements, which could ensure the absence of negative environmental impacts that cannot always be reflected in an ex ante typology of EHS. It could also capture the specific environmental vulnerabilities or absence thereof prevailing in the country implementing the support scheme. The core set of subsidies deemed to be harmful could largely build on existing findings from the literature, theoretical studies, and applied modelling and for which it may be easier to gather consensus.

In practice, this approach would be similar to the one under negotiation in the second phase of the fisheries subsidies talks where members are defining a set of subsidies deemed to contribute to overcapacity and overfishing. Such subsidies would be prohibited unless the subsidizing WTO member demonstrates that measures are implemented to maintain the targeted fish stocks at a biologically sustainable level. Experience in the fisheries negotiations shows, however, that establishing exactly what should be demonstrated and how is likely to be hotly debated. In the case of agriculture, defining an objective threshold demonstrating the absence of environmental harm or environmental benefit is also likely to be more complicated than in fisheries where the notion of stocks maintained at biologically sustainable levels is already fairly well established. Depending on the type of environmental challenges being discussed—GHG emissions, soil or air pollution, biodiversity loss, or water quality and availability—agreeing on particular metrics and specific thresholds can be particularly difficult.[20]

From this perspective, an easier approach would be to demonstrate that effective flanking measures or cross compliance requirements are implemented, ensuring that negative environmental effects do not occur, combined with a review mechanism monitoring the effect of the subsidy scheme over time. Another downside of such an approach, as illustrated by the fisheries subsidies talks, is that demonstrating the absence of environmental damage may be more difficult for developing and least developed countries where relevant data may not be readily available.

19 It would also be consistent with the precautionary principle anchored in the legal framework of several countries.
20 One example is the use of biodiversity indicators for results-based agri-environmental payments in the European Union and Switzerland. Under such schemes, farmers receive payments for delivering predefined environmental outcomes based on the ecological quality achieved on the cultivated site. This requires correspondingly extensive monitoring of the target ecological values achieved. See for example Elmiger et al. (2023).

7.6 Effective Special and Differential Treatment Provisions to Address Trade-Offs Between Policy Goals

As discussed above, environmental policies can come into conflict with other policy objectives such as rural development imperatives or food and livelihood security. This challenge is particularly acute in developing countries still confronted with major development needs. While addressing these trade-offs is not an feature that helps define EHS, it remains a critical dimension to consider and reflect if and when governments decide to elaborate further international disciplines on EHS (see section 8). The experience so far suggests that striking the right balance between sometimes conflicting national objectives is often addressed through specific exemptions in trade rules or special and differential treatment provisions. In the case of agriculture, such an approach is justified to the extent that subsidies are heavily concentrated among a limited number of large producing countries mostly in the developed world and a handful of emerging economies. In other words, the large majority of developing countries, including least developed countries, only account for a negligible share of global subsidies. In fact, many of these economies would significantly benefit from increased investment in agriculture. In other words, exempting some of these countries would not significantly undermine the overall objective of subsidy reform. Special and differential provisions in the form of specific exemptions can also help overcome the challenges that some developing countries could face in implementing some of the options suggested above.

In practical terms, examples of specific flexibilities are found in numerous existing WTO disciplines and are subject to ongoing negotiations under the second phase of the fisheries subsidies talks. They include longer transition periods as well as particular exemptions from general prohibitions for countries accounting for a negligible share of the global environmental damage, for small-scale, low-income or resource-poor producers, or for countries at low levels of economic development such as least developed countries.

8. Tackling Environmentally Harmful Agricultural Subsidies Through International Cooperation

While achieving more sustainable agricultural systems will ultimately require approaches that go beyond subsidies, reforming EHS remains a necessary first step in this transition process. So far, however, progress has been slow. While some governments are undertaking autonomous reforms aimed at repurposing existing schemes, and several initiatives are emerging to support the implementation of Target 18 of the Kunming-Montreal Global Biodiversity Framework, most of these efforts focus on the country level. While domestic action is ultimately key to removing EHS, such autonomous efforts would significantly benefit from cooperation at the international level to reach the global target and avoid a patchwork of uncoordinated and possibly conflicting initiatives. Furthermore, as highlighted above, in the absence of coordinated action, autonomous reform in one country can lead to leakage or enhanced environmental degradation in third countries as they increase their domestic production to compensate for declining outputs associated with the reform. More broadly, experience has shown that international discussions, including peer pressure, play a key role in strengthening the case for subsidy reforms and spurring compilation of relevant data and experiences. Finally, cooperative approaches can avoid the free rider problem and alleviate concerns of loss of competitiveness as a result of domestic subsidy reform.

Building on the Kunming-Montreal Global Biodiversity Framework commitments enshrined in Target 18, such cooperation could contribute to supporting, clarifying, and identifying concrete approaches to meet existing commitments. It could be pursued in a variety of fora or processes such as the WTO, OECD, G20, FAO, and World Bank, as well as in regional contexts.[21] While these processes tend to involve different communities and stakeholders, connecting the dots between these initiatives could be vital to bolster interest and "buy-in" for devoting more attention to the challenge of environmentally harmful agricultural subsidies and ensuring relevance to ongoing discussions among policymakers. For example, addressing the sustainability dimension of subsidies in ongoing domestic support negotiations in the WTO could play a key role in advancing global biodiversity goals at the multilateral level. Similarly, enhanced data and analysis on the environmental impacts of agricultural subsidies in ongoing efforts by the OECD to monitor agricultural policies could support the Kunming-Montreal Global Biodiversity Framework goal of scaling up positive incentives for the conservation and sustainable use of biodiversity.

Such cooperation could also take a wide range of different forms depending on what is realistically achievable in different contexts. At the broadest level, sustainability considerations could be reflected in ongoing international negotiations aimed at developing new rules and enhanced disciplines on agricultural subsidies, notably in the context of WTO negotiations where environmental considerations are regularly invoked in the special sessions of the Committee on Agriculture. However, with the exception of a milestone 2015 ministerial decision to progressively eliminate export subsidies (WTO, 2015), WTO negotiations have largely been stalled since 2008, and persisting divergences among members are unlikely to be overcome in the near future.

Beyond new disciplines, international fora and processes can provide a unique space to facilitate exchanges of good practices and lessons learned from autonomous reform, enabling countries to align their policies more closely with sustainability objectives while respecting diverse national contexts. Enhanced transparency on the sustainability dimensions of domestic support schemes based on standardized reporting requirements and regular peer review process could similarly lay the groundwork for concerted action. Finally, more advanced forms of cooperation could also consist in developing collective approaches such as guidelines or guidance for the design of subsidy schemes or unilateral pledges. Encouraging commitments to reduce environmentally harmful subsidies and repurposing existing schemes can serve as a catalyst for change, incentivizing nations to proactively address the environmental impacts of their agricultural support schemes. Similarly, guidance on the design of subsidy schemes could provide a useful framework to support countries in their efforts to transition towards more sustainable agricultural practices.

21 For example, several countries in the Amazon basin, including Bolivia, Brazil, Colombia, Ecuador, and Peru, have been advancing different cooperation initiatives following the 2024 UN Biodiversity Conference (COP16) in October in Cali and en route to the 2025 UN Climate Change Conference (COP30) in November in Belém. The connection between deforestation or forest degradation and loss of biodiversity constitutes an opportunity to build cooperative approaches in the region, especially on issues related to the establishment of pastures for cattle ranching and the expansion of monocultures such as palm oil and soybeans.

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