



Towards more sustainability in the soy supply chain:

How can EU actors support zero deforestation and SDG efforts?

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deforestation and SDG efforts?

For Deutsche Gesellschaft für
Internationale Zusammenarbeit
(GIZ) GmbH on behalf of the
German Federal Ministry for
Economic Cooperation and
Development (BMZ)

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Global Canopy
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List of abbreviations

AAPRESID	Argentine Association of Direct Sowing Producers
ABC Plan	Brazil's Low Carbon Agriculture Plan
ABIOVE	Brazil's Vegetable Oil Industry Association
ACA	Asociación de Cooperativas de Argentina
ACSOJA	Argentinian soybean supply chain association
ADP	Amsterdam Declarations Partnership
AFA	Argentine Federated Farmers
AFI	Accountability Framework Initiative
APROSOJA	Association of Producers of Soybeans and Maize of the State of Mato Grosso
ASC	Certified Sustainable Agriculture
BMEL	German Federal Ministry of Food and Agriculture
BRL	Brazilian Reais
CAR	Environmental Rural Registry
CARBIO	The Argentinian Chamber of Biofuels
CBD	Convention on Biological Diversity
CDP	Non for profit that runs an annual disclosure system
COFCO	China National Cereals, Oils and Foodstuffs Corporation
CRA	Agribusiness Credit Receivable Certificates
CRSSG	China Responsible Soy Sourcing Guidelines
CSR	Corporate Social Responsibility
EEZ	Ecological-Economic Zoning
EMBRAPA	Brazilian Agricultural Research Corporation
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FEDIOL	European Vegetable Oil and Protein meal Industry Association
FEFAC	European Feed Manufacturers' Federation
FLEGT	Forest Law Enforcement, Governance and Trade
GDP	Gross Domestic Product
GHG	Greenhouse gas
GM	Genetically modified
GRI	Global Reporting Initiative
GTC	Cerrado Working Group
IDH	Sustainable Trade Initiative
ILUC	Indirect Land use Change
Imaflora	Institute of Agricultural and Forest Management and Certification
INPE	National Institute for Space Research
INTA	National Agricultural Technology Institute
IPAM	Amazon Environmental Research Institute
ISCC	International Sustainability and Carbon Certification
LDC	Louis Dreyfus Company
MAPA	Brazilian Ministry of Agriculture
MoU	Memorandum of Understanding
MRIO	Multi-Regional Input-Output
NGO	Non-governmental organizations

ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
OTBN	Native Forest Territorial Ordinance Law
PCI	Produce, Conserve and Include
PCUS	Land Use Change Plans
PPCDAm	Action Plan for the Prevention and Control of Deforestation in the Legal Amazon
PPCerrado	Action Plan for Prevention and Control of Deforestation and Forest Fires in the Cerrado
PRA	Environmental Compliance Program
REDD+	Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
RTRS	Round Table on Responsible Soy
SCC	Soft Commodities Compact
SDGs	Sustainable Development Goals
SDR2019	Sustainable Development Report 2019
SDSN	Sustainable Development Solutions Network
SFB	Brazilian Forest Service
SNCR	National Rural Credit System
SSTP	Sustainable Soy Trade Platform
UMSEF	Forest Evaluation System
UNCCD	United Nations Convention to Combat Desertification
UNEA	UN Environment Assembly
UNFCCC	UN Framework Convention on Climate Change
UNFF	UN Forum on Forests
US	United States
USDA	US Department of Agriculture
VLR	Voluntary Local Reviews
VNR	Voluntary National Reviews
VPA	Voluntary Partnership Agreements
WBA	World Benchmarking Alliance
WBCSD	World Business Council on Sustainable Development
WTO	World Trade Organization

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Foreword

Soy is the second most traded food commodity in the world and one of the main drivers of commodity-driven forest loss. Growth in population and changes in consumption behaviors foreshadow more soy production and thus – unless the sustainability of its supply chain is addressed – a rise in deforestation. In order to avoid environmental damage caused by soy production and consumption, stakeholders in both the supply and demand of soy need to work towards systematically improving the global supply chain. This includes strengthening standards and safeguards of soy production in producer countries, notably Brazil and Argentina, and measures that increase the demand for sustainable soy in importing regions. Measures by the EU and China, the main global importers of soy, are particularly important to reduce the demand for unsustainable soy.

In this context, several projects of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) aligned their work on sustainable and deforestation-free agricultural supply chains, on agricultural and trade policies, and on SDG Impact Analysis and joined hands; namely the Sector Project Agricultural Trade, Agribusiness, Agricultural Finance (AAA); The Programme on Sustainable Agricultural Supply Chains, and the Global Project Strengthening the Sustainable Development Solutions Network (SDSN). In this context, GIZ, on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) commissioned the consortium of Climate Focus and Global Canopy to carry out an assessment on the interlinkages between soy supply chains and their socio-economic and environmental impacts. In particular, this study aims to understand the implications of soy production for the Sustainable Development Goals (SDGs) and how EU actors can improve the SDG impact of soy production and consumption. The present study is the outcome of a nine-months assessment which builds upon several pieces of research, including a stakeholder analysis, the development of an analytical framework, an inception workshop with the GIZ and the BMZ (27.03.19), as well as consultations with more than 20 key soy supply chain stakeholders and experts.

Early on in our research it became clear that current events would influence and shape the analysis. In the past year, the China-US trade conflict shifted global trade routes for soy considerably, generating spill-over effects for Brazilian producers. African swine fever had global repercussions for soy trade as it reduced China's soy meal requirements substantially and became the main concern for Chinese feed manufacturers and the pork industry. More recently, a surge in forest fires in the Amazon, to which the weakening of public institutions responsible for forest conservation and enforcement in Brazil contributed, raised political tension. Norway and Germany partially suspended their financial support to deforestation reduction programs and some EU actors consider additional conditions attached to the ratification of the EU-Mercosur trade agreement. Our study took these developments and associated political sensitivities into account when formulating policy recommendations.

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Executive Summary

Soy is a major driver of deforestation and sustainable degradation in Latin America and accounts for 47 per cent of the EU's imported deforestation from agricultural and livestock commodities. It is also associated with social injustice and acts as driver of environmental degradation that hinders the achievement of the Sustainable Development Goals (SDGs). The soy supply chain is global, crossing many country borders across its production and processing levels. Addressing the negative impacts of the soy supply chain and associated spillover effects requires global, national and subnational policy instruments and initiatives in both soy producing and consuming countries.

The EU and China are the two major importers of soy products, accounting for respectively 15 per cent and 42 per cent of the global soy product imports in 2018. Almost three quarters of imported soy products (70-75 percent) are used as a cheap source of protein feed. This as well as the use of soy oil as vegetal edible oil and biofuel has driven a soy boom, from 100 million tonnes in global annual production in the early 1990's to 362 million tonnes in 2018. Brazil and Argentina harvest respectively 34.4 per cent and 14.4 per cent of the world soy production.

In the Chaco region of Argentina and the Amazon and Cerrado regions of Brazil, soy is a driver of direct and indirect deforestation. Soy imports are also a major driver of imported embedded deforestation for the EU and China. Imports from production regions with deforestation, such as the Amazon and Cerrado, have much higher deforestation risk. The soy sourced from Brazil's Matopiba region, which accounts for only 16% of the EU soy imports from Brazil in 2017, carries 85% of the associated deforestation risk. Soy exports to China between 2013 and 2017 accounted for the loss of 223,000 hectares of forest. Since early 2019, subsequent to the weakening of the public institutions in charge of enforcing legal sanctions against deforestation, deforestation and forest fires have increased in Brazil's Amazon region, but it is unclear how much of that increase is driven by soy production.

Based on an analysis of relevant stakeholders and policy instruments, we have developed a number of **policy recommendations for the EU and Germany** on how to address negative impacts of soy production, processing and trade. The summary of our recommendations is in the table at the end of this executive summary.

At the production level, jurisdictional and sectoral approaches hold some promise to increase the sustainability of soy production. There are several public policy instruments that regulate land use and therefore deforestation in Brazil (e.g. Ecological-Economic Zoning (EEZ), Environmental Rural Registry (CAR), the Environmental Compliance Program (PRA) and Native Forest Territorial Ordinance Law (OTBN)). However, law enforcement is weak as the political will of public actors and the capacities of the institutions in charge of the enforcement fail

to match the needs. Multi-stakeholder initiatives supported by public and private actors are seeking to compensate for weaknesses of national or regional governments. The Amazon Soy Moratorium is an example of a successful collaborative effort. Other multi-stakeholder initiatives working towards sustainable land use include the Cerrado Working Group and Produce, Conserve and Include in the State of Mato Grosso.

It is essential to support the adoption of sustainable production best practices by soy farmers. There are public (e.g. INTA, EMBRAPA) and private extension services (e.g. Soja Plus) that are already supporting a transition to sustainable practices which could be strengthened. In addition, there are financial mechanisms that support soy farmers which could become conditional on sustainability requirements (e.g. the National Rural Credit System in Brazil and new private financial mechanisms) and linked to jurisdictional approaches.

Company action needs to be stimulated and supported. Major private companies have adopted corporate commitments to improve the sustainability of company practices and to source soy more sustainably. It is essential to hold companies accountable with respect to progress towards such commitments, which depends on company reporting. Transparency and assessment of the progress undertaken provides a stimulus for companies and a better understanding for consumers and other supply chain actors of the sustainability of the soy supply chain. Initiatives such as CDP or the Accountability Framework Initiative (AFI) facilitate company reporting.

Consideration in trade agreements or import regulation can also help to eliminate deforestation from soy imports. For example, the recent Mercosur Trade Agreement could be the entry point to formulate certain standards relating to the sustainability of the soy supply chain. In addition, there are specific policy instruments which define export and import standards, such as the development of mandatory due diligence requirements or a revision of the renewable energy EU directive to include soy as a high-risk commodity.

The demand for certified soy needs to increase to change farmers' practices. Certification helps to ensure the sustainability of the soy but covers a small part of the soy supply chain. To increase demand for certified soy, EU or country-specific public procurement guidelines can formulate sustainability criteria for supplied soy. In addition, sectoral and corporate private commitments by feed providers, traders, processors and retailers will ensure the long-term uptake of demand for sustainably certified soy. The major soy certifying organizations are the Roundtable for Sustainable Soy and the Proterra Foundation. They are complementary to the adoption of sourcing guidelines by the industry (e.g. European Feed Manufacturers' Federation's (FEFAC) sourcing guideline, China Responsible Soy Sourcing Guidelines (CRSSG), Argentine Federated Farmers (AFA), and companies such as Louis Dreyfus Company (LDC) and Vicentin Group).

Ensuring large coverage makes sustainability standards more effective. Considering China's dominant market position, it is essential that EU actor enter into a dialogue with Chinese public and private stakeholders on deforestation-risk

commodities. The NGO-driven Sustainable Soy Trade Platform could be the entry point for the development of joint initiatives with Chinese actors of the supply chain.

Summary of recommendations for the EU and German government		
	What?	How?
Improving soy production		
In Brazil	Support jurisdictional approaches in soy-producing regions.	Support financially the “Produce, Conserve and Include” (PCI) implementation in Mato Grosso (e.g. through REM, & Green fund, TFA). Provide technical assistance in formulating land use plans and integrated policy approaches in other soy-producing regions such as in the MATOPIBA region.
	Support the Soy Working Group (Cerrado region).	Support technically and financially the mechanisms to channel funds towards farmers that go beyond the legal deforestation requirements.
In Argentina	Strengthen the national authority in charge of managing the Forest Evaluation System (UMSEF).	Provide technical assistance to improve data quality, dissemination and coordination of UMSEF.
	Strengthen the capacities of INTA, the Argentinean public rural extension service agency.	Build on existing German cooperation programs and expand efforts to support sustainable agricultural practices in Argentine soy farming systems.
Demand-side measures by EU countries		
Ensure a strong implementation of the EU Communication on Stepping up EU Action to Protect and Restore the World’s Forests.		Assist the European Commission in the evaluation of regulatory and non-regulatory measures to implement the EU Communication. Adopt domestic plans and measures to eliminate the import of embedded deforestation.
Adopt mandatory due diligence requirements.		Mandate companies to conduct due diligence to assess, prevent and mitigate their environmental, social and governance risks and impacts of their soy supply chains and operations.

<p>Classify soy as a high-risk commodity under the biofuels directive.</p>	<p>Support an EU-wide assessment on the direct and indirect soy-driven conversion of forests.</p> <p>Amend the renewable energy directive classification of soy as a low-risk for indirect land use change biofuel.</p>
<p>Formulate standards for company reporting on soy impacts.</p>	<p>Strengthen the reporting and disclosure requirements of the existing Non-Financial Reporting Directive, based on the OECD Guidelines for Multinational Enterprises which include SDG reporting.</p>
<p>Up-scale the demand for certified soy</p>	<p>Promote feed providers' and retailers' voluntary commitments towards sustainable and zero-deforestation soy.</p> <p>Encourage German companies to assume sustainability commitments (following the Danish Alliance for Sustainable Soy and Dutch Soy Coalition examples).</p> <p>Support the promotion of Pro-Terra, RTRS, ISCC and other zero deforestation certification standards.</p> <p>Adopt public procurement procedures that demand soy to be certified (as deforestation free).</p>
<p>Take measures to reduce meat consumption.</p>	<p>Promote the reduction of meat consumption as part of climate and health policies.</p> <p>Provide incentives for reduced meat consumption through promoting plant-based foods in public-sector cafeterias, universities and schools.</p> <p>Reduce livestock stocking rates in Germany and Europe (as part of climate policies).</p>
<p>Invest in improving the transparency of soy imports.</p>	<p>Collect and make available data on direct and re-exports, including volumes (including certified soy), companies and likely associated environmental and social impacts.</p>
<p>Ensure the inclusion of strong soy-related targets in trade agreements.</p>	<p>Consider including soy sustainability-related provisions in international and regional trade agreements.</p>
<p>Engaging China</p>	

Expand the Amsterdam Declaration Partnership.	Co-host events of the Amsterdam Declaration Partnership (ADP) with China. Invite China to join the ADP.
Align criteria for sustainable sourcing guidelines.	Host dialogues between EU feed associations (such as the European Feed manufacturers' Federation) and Chinese feed traders and purchasers. Disseminate tools for tracking and tracing soy supply chains with Chinese partners, among others to enable the operationalization of the China Responsible Soy Sourcing Guidelines. Engage with Chinese partners in the Soft Commodities Forum, the Sustainable Soy Trade Platform, TFA and the Cerrado Working Group.
Increase visibility of soy sustainability concerns in international fora.	Support China's efforts to make the Convention on Biological Diversity COP at Kunming in 2020 a success. Coordinate with China efforts to increase visibility of efforts to increase soy sustainability in other international fora.
Improve SDG reporting	
Upscale the integration of SDG reporting as a CSR good practice.	Provide technical assistance to adapt CSR rating tools in order to integrate SDG reporting. Promote SDG reporting tools as CSR good practices in national and international business fora.
Enhance the SDG monitoring instruments to fill knowledge gaps and enable policy tracking.	Include and support the inclusion of consumption-based measures in official monitoring instruments (e.g. VNRs). Support the expansion of initiatives that enable the assessment of policies contribution to achieve SDGs (e.g. Climate Action Tracker) beyond countries with the needed technical capacity and GHG emissions.
Engage stakeholders of other soy producing regions.	Support the participation and engagement of stakeholders from other countries producing soy (e.g. Paraguay, Bolivia) to avoid further leakages and SDG spillovers.

1. Introduction

1.1 Sustainability of soy

Global production of soy has doubled – in some countries tripled¹ – since 2000.² The majority of global soy is produced in North and South America with the United States (US), Brazil and Argentina as the largest producers accounting for 82 percent of the world production in 2017.³ About three quarters of all soy production goes into animal feed, with the remainder being used for biofuel and food production.⁴

Soy is one of the most prominent drivers of global forest loss. From 2000 to 2010, South America converted 24 million hectares of land from natural ecosystems - tropical rainforests and savannahs- to cultivated area. Over 80 percent of this land-use change can be attributed directly or indirectly to soy production. The expansion of soy drives deforestation either directly through the clearing of forest to crops, or indirectly through the displacement of existing pasture land leading to further clearing for new pasture land.^{5,6} The loss of tropical forests destroys an irreplaceable ecosystem, causes the loss of biodiversity, and alters rainfall patterns and the local climate. The conversion of land to soy cultivation increases runoff of precipitation three-fold in comparison to forested area leading to drying of the local climate.⁷ Deforestation also destroys the livelihood of forest-dependent indigenous peoples and local communities and can also lead to their displacement.

Soybean crop production is highly dependent on irrigation systems in specific areas, and high-water demand can further lead to water stress in producing areas, in particular during climatic phenomenon such as el Niño.^{8,9} Fertilizer and pesticides used in soy production may also worsen the quality of water bodies in producer regions. The common use of glyphosate in soy production has also been associated with negative health effects on farm workers as well as negative environmental impacts on biodiversity, notably aquatic life.¹⁰

¹ Paraguay's soy production has tripled over the last two decades, now covering 80 percent of the countries agricultural area.

² Brack, D., Glover, A., & Wellesley, L. (2016). *Agricultural Commodity Supply Chains Trade, Consumption and Deforestation* (Research Paper) [Research Paper]. Retrieved from <https://www.chathamhouse.org/sites/default/files/publications/research/2016-01-28-agricultural-commodities-brack-glover-wellesley.pdf>.

³ FAO. (2016). FAOSTAT. Retrieved August 13, 2019, from <http://www.fao.org/faostat/en/#data>.

⁴ USDA FAS. (2019c). *Oilseeds: World Markets and Trade - Market Uncertainties of 2018/19 Haunt 2019/20 Prospects*. Retrieved August 12, 2019, from <https://apps.fas.usda.gov/psdonline/circulars/oilseeds.pdf>.

⁵ Nepstad, D. C., Stickler, C. M., Filho, B. S.-, & Merry, F. (2008). Interactions among Amazon land use, forests and climate: prospects for a near-term forest tipping point. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 363(1498), 1737–1746.

⁶ Barona, E., Ramankutty, N., Hyman, G., & Coomes, O. T. (2010). The role of pasture and soybean in deforestation of the Brazilian Amazon. *Environmental Research Letters*, 5(2), 024002.

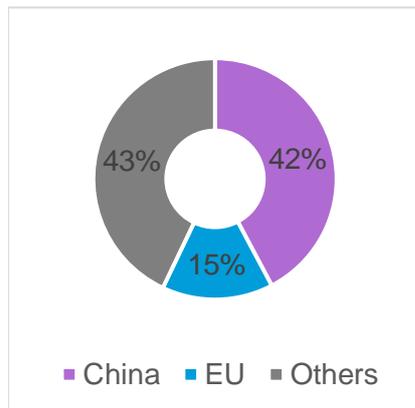
⁷ Hayhoe, S. J., Neill, C., Porder, S., Mchorney, R., Lefebvre, P., Coe, M. T., et al. (2011). Conversion to soy on the Amazonian agricultural frontier increases streamflow without affecting stormflow dynamics. *Global Change Biology*, 17(5), 1821–1833.

⁸ Anderson, W., Seager, R., Baethgen, W., & Cane, M. (2017). Crop production variability in North and South America forced by life-cycles of the El Niño Southern Oscillation. *Agricultural and Forest Meteorology*, 239, 151–165.

⁹ Arena, A. P., Piastrellini, R., & Civit, B. (2011). Water footprint of soybean production in Argentina. Presented at the Lifecycle Management Conference, Berlin, Germany.

¹⁰ Dalgaard, R., Schmidt, J., Halberg, N., Christensen, P., Thrane, M., & Pengue, W. (2008). LCA of soybean meal. *The International Journal of Life Cycle Assessment*, 13, 240–254.

Figure 1 EU and China's share of world soy imports in 2018



Source: USDA FAS (2019)

While the majority of global soy is consumed domestically, about 40 percent of it is traded internationally.¹¹ China is the main consumer of soy, importing around 40 percent of

internationally traded soy products in 2017 and 2018, mainly as a source of animal feed.¹²

Growth in populations and changes in consumption -including shifts to meat-based diets in emerging economies- are expected to further drive expansion of soy production and its embedded deforestation. With about 15 percent the European Union (EU) is the second largest importer of soy products in 2017 and 2018

([Figure 1](#)). Even though the EU has a domestic soy production of around 2-3 million tonnes,¹³ it imported around 15 million tonnes of soybean and 18 million tonnes of soybean meal in 2017 and 2018, which accounted for around 90% of its soy products domestic consumption in 2017 and 2018.¹⁴ Germany, imports around 3 million tonnes of soybean and 3 million tonnes of soybean meal annually.¹⁵

The large environmental impact of most large-scale soy production systems together with the high versatility of soy sub products and large volumes of traded commodity makes soy sustainability an international concern. Making soy more sustainable is also essential for meeting the Sustainable Development Goals (SDGs) as well as the temperature goals of the Paris Agreement. As such, producer countries need to take measures to reduce the adverse environmental and social impact of soy, and consumer countries must recognize and take steps to address the sustainability impacts associated with their soy imports and consumption patterns.

1.2 Objective, approach and scope of the report

The goal of this study is to develop recommendations for Germany and other EU countries to improve the sustainability of soy along the supply chain. In the context of this study we reviewed the negative externalities of soy production and consumption, analyzed policies that hold the potential to address these externalities, captured these actions in SDG reporting, and developed recommendations for EU countries on how to strengthen the sustainability of the soy supply chain. We evaluated the effectiveness of various policy instruments in producer (Argentina and Brazil) and consumer countries (China) and consumer union countries (EU).

¹¹ USDA FAS. (2019c).

¹² USDA FAS. (2019c).

¹³ 2.9 million tons in the 2019/20 forecast. EU oilseeds and protein crop production statistics. https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/overviews/market-observatories/crops/oilseeds-and-protein-crops_en, Retrieved 22 November 2019.

¹⁴ USDA FAS. (2019c). EU Crops Market Observatory, <https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/overviews/market-observatories/crops> Retrieved 22 November 2019.

¹⁵ United Nations Statistics Division. (2019a). *UN Comtrade | International Trade Statistics Database*. Retrieved March 14, 2019, from <https://comtrade.un.org/data>.

The responsibility to address the negative environmental and social impacts of soy production should be shared among the supply chain actors, reaching from producers to importers. To attain the SDG targets by 2030, it is crucial that private and public actors along the supply chain adopt policies and measures which are effective and scalable in ensuring the production, export and import of sustainable soy.

This study is oriented towards the SDGs to define pathways towards more sustainable soy supply chains. This includes a focus on spill-over effects from selected consumer markets (China and Europe) sourcing soy from Latin America (Argentina and Brazil), and in particular on deforestation (SDG 15), which is a sustainability concern related to soy product. But other SDGs are also affected, such as SDG 2 on zero hunger, SDG 6 on clean water and sanitation and SDG 12 on responsible consumption and production. This study builds on a stakeholder analysis of the soy supply chain that mapped relevant actors, as well as the policy instruments at their disposal and existing initiatives that support actions to improve the sustainability of the soy supply chain. The study provides an analysis of the most relevant soy-related policy instruments and initiatives - assessing their limitations, identifying opportunities for improving their effectiveness, and enabling their upscaling. In this context, the study also identifies opportunities on how to capture improvements in the sustainability of the soy supply chain in the SDG reporting of consumer countries.

The scope of the analysis is limited geographically to Brazil and Argentina at the supply level and the EU and China at the demand level. We identify and emphasize those initiatives which have potential for EU support and involvement. We also consider the soy sub-products which are associated with the highest risk of embedded deforestation and which have the most potential for improvement, namely soy which is used for livestock feed and to a lesser extent for industrial uses, particularly biofuels.

1.3 Structure of this report

Following the introduction presented in this chapter, chapter 2 summarizes the economic context of the soy supply chain. It includes an analytical summary of the major developments in the soy commodity market over the last two to three years, as well as a description of the structure and main characteristics of the soy supply chain in the priority countries analyzed in this study.

Chapter 3 to 5 summarize the main factual input for the policy recommendations developed in chapter 6. They link environmental and social impacts of soy (chapter 3) with the most relevant actors in the supply chain (chapter 4) and existing initiatives with a potential to influence soy sustainability (chapter 5). Chapter 3 summarizes the main sustainability risks in the soy supply chain, focusing mainly on deforestation and supply chain spill-over effects. These impacts are then linked to the SDGs they mostly affect. The resulting SDG reporting framework provides a basis for the study's analysis and conclusions. Chapter 4 summarizes the findings of the stakeholder analysis describing governance structures and providing an overview of key actors in the supply chain. Chapter 5 discusses the most relevant global, regional and national policy

instruments and initiatives that aim to improve the sustainability of the soy supply chain.

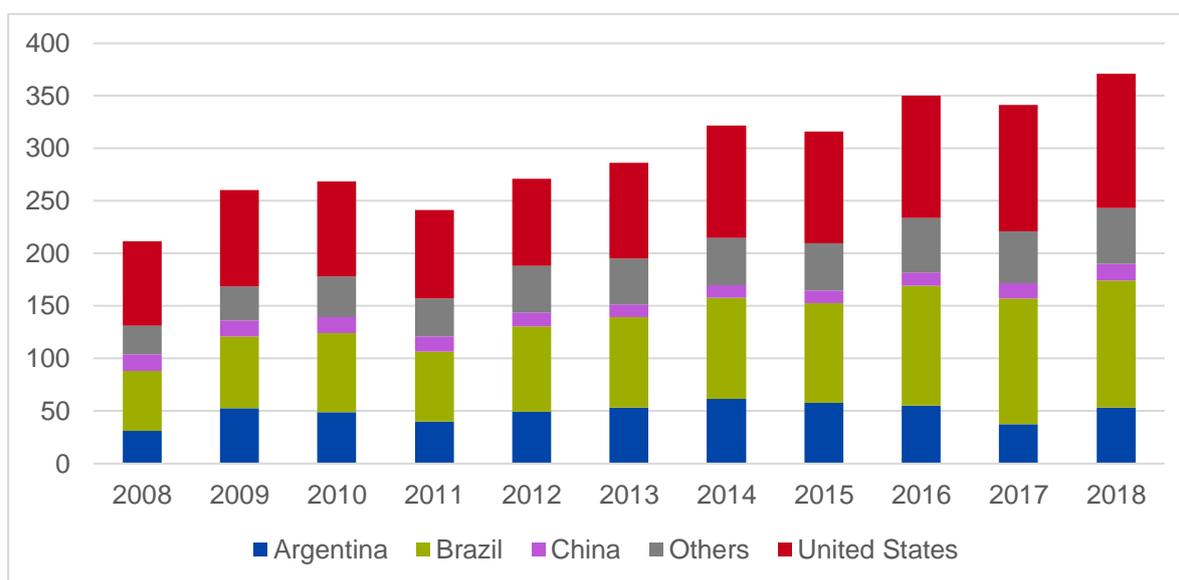
Finally, chapter 6 summarizes the analytical findings of our study and provides targeted policy recommendations for EU actors. These are tailored to EU public stakeholders on how to improve soy sustainability.

2. Supply chain market and sustainability context

2.1 Soybean commodity market analysis and outlook

Soy is one of the most important food commodities in the world.¹⁶ Soy is a particularly versatile commodity that can fulfil multiple purposes; its sub-products are a widespread low-cost source of protein for feed, but soybeans can also be processed into edible vegetable oil.

Figure 2 World soy production (Million tonnes)



Source: USDA FAS (2019)¹⁷

Since the rise in soy trade seen in the early 1990s, Brazil's soy production and to a lesser extent Argentina's soy production has skyrocketed. At global level, soy production has risen from 100 million tonnes produced per year in the early 1990's to 362 millions in 2018.¹⁸ Within a decade, the amount produced in Brazil almost doubled from 57.8 million tonnes in 2008 to 122 million tonnes in 2017 (Figure 2).¹⁹ This boom has largely been driven by a rapidly growing demand for soybean meal in China, as well as a sharp increase in livestock production and meat consumption. As a result, Chinese stakeholders have been investing in supply infrastructure in different soybean producing countries.²⁰ Major investments were and continue to be undertaken in all different stages of the supply chain (land,

¹⁶ OECD, & FAO (Eds.). (2018). *OECD-FAO Agricultural Outlook 2018-2027: Special focus: Middle East and North Africa*.

¹⁷ USDA World Agricultural Outlook Board. (2019). *World Agricultural Supply and Demand Estimates*, February 2019 (No. 585) (No. 585). Retrieved March 14, 2019, from <https://www.usda.gov/oce/commodity/wasde/wasde0219.pdf>.

¹⁸ Data & Analysis | USDA Foreign Agricultural Service. (n.d.). Retrieved March 15, 2019, from <https://www.fas.usda.gov/data>.

¹⁹ USDA FAS. (2019c).

²⁰ Solidaridad. (2016). *China's Soy Crushing Industry: Impacts on the Global Sustainability Agenda*. Retrieved March 15, 2019, from <https://www.solidaridadnetwork.org/sites/solidaridadnetwork.org/files/publications/China%20Soy%20report.pdf>.

road, crushing facilities, storage, ports), especially in Brazil and Argentina.^{21,22} The increase in international demand for soy has also been accompanied by a series of domestic policy reforms in Brazil and Argentina which have shaped and enabled the export-oriented nature of the soy expansion. In the case of Brazil, in 1996 the Kandir Law reduced the tax differentials among soy products for export, leading to an expansion of soybean exports to the detriment of processed soy products.²³ In Argentina, the export tax policy has changed several times over the past decades from differentiated tax levels to uniform tax levels. Since 2015, the trend has been of reduced export taxes for agricultural products with rates for soybeans being gradually cut from 26 to 18 percent. However, in December 2018, an additional 12 percent export taxes were established to all exports, including soy products, in response to the country's recession.²⁴

The soy market evolved differently in the EU. Imports have remained stable since 2007 with around 35 million tonnes being imported to the union on a yearly basis between 2007 and 2017²⁵. As [Figure 3](#) shows, during this time period, the share of Brazilian and Argentinian soy imported in the EU declined each year by around 20 percent. At the same time imports from other countries, in particular the U.S. and Paraguay, but also other minor soy exporters, increased. However, the recent trade conflict between China and the U.S. has significantly impacted the EU – as well as the global – soy market. The EU has absorbed some of the U.S. soybean and soymeal that was previously exported to China.²⁶ In 2019, the EU imported 72 percent of its soy beans from the U.S. followed by Brazil with 21 percent, which represents an increase in the share of U.S. imports of 121 percent compared to the same period in the previous year.²⁷

²¹ FAO. (2015a). *Oilseeds, oils, & meals: Monthly price and policy update, March 2015* (p. 7). Retrieved March 15, 2019, from

http://www.fao.org/fileadmin/templates/est/COMM_MARKETS_MONITORING/Oilcrops/Documents/MPPU_Mar__15.pdf.

²² FAO. (2015b). *Oilseeds, oils, & meals: Monthly price and policy update, September 2015* (p. 6). Retrieved March 15, 2019, from http://www.fao.org/fileadmin/templates/est/COMM_MARKETS_MONITORING/Oilcrops/Documents/MPPU_Sep_15.pdf.

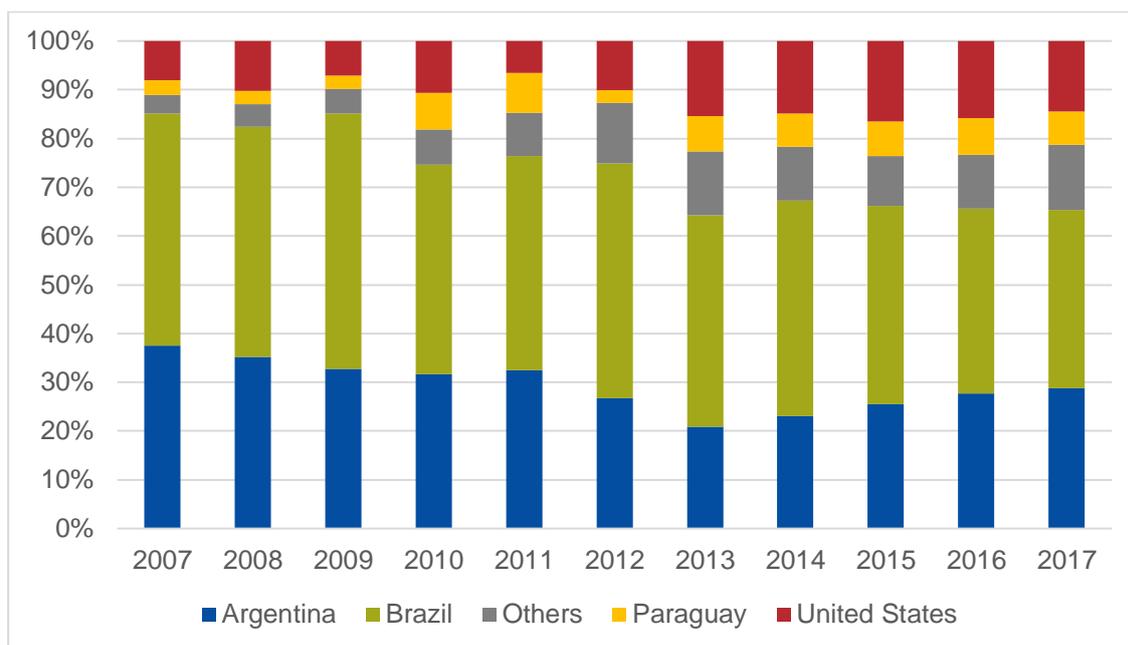
²³ Peter, Goldsmith, & Rodolfo, Hirsch. (2006). The Brazilian Soybean Complex. *Choices, the Magazine of Food, Farm and Resource Issues*, 21(2), 97–104.

²⁴ OECD. (2019). *Agricultural Policy Monitoring and Evaluation 2019*. Retrieved from <https://doi.org/10.1787/39bfe6f3-en>.

²⁵ United Nations Statistics Division. (2019a).

²⁶ EU Crops Market Observatory. (2019, August 14). EU Crops Market Observatory - Oilseeds and protein crops. Retrieved from https://ec.europa.eu/agriculture/market-observatory/crops/oilseeds-protein-crops/statistics_en.

²⁷ EU Crops Market Observatory. (2019, August 14).

Figure 3 Share of EU soy imports²⁸ per major exporter

Source: United Nations Department of Economic and Social Affairs (2019)²⁹

In a retaliatory measure to U.S. tariffs on a list of Chinese products, China imposed an additional 25 percent tariff on soybeans coming from the U.S. in July 2018.³⁰ This shifted U.S. exports from China to the EU. In addition, 2018 saw the first drop in Chinese soybean imports since the early 2000's.³¹ As the conflict continues, China has started to substitute its imports of U.S. soybeans in different ways. For example, in late 2018, the Chinese government announced that it would start importing soy from Bolivia.³² In addition, the China Feed Industry Association lowered the protein levels of pig and poultry feed standards to reduce the demand for soybean.^{33,34} China also launched a campaign last year to promote its national soybean production: in November 2018, the largest state soybean producer announced to double its soybean subsidy to farmers.³⁵ In addition, the Chinese government has announced a strategy to support domestic soy and other oilseed crops production for reasons of self-sufficiency and food security.³⁶ Based on these announcements the U.S. Department of Agriculture (USDA) and the UN Food and Agricultural Organization (FAO) predict an annual 8 percent increase in China's soybean plantation area in 2019.

²⁸ Unless otherwise specified, soy imports and exports always include all soybean main sub-products such as soybean oilseeds, soy meal and cake and soy oil.

²⁹ United Nations Department of Economic and Social Affairs. (2019). UN Comtrade: International Trade Statistics Database. Retrieved August 12, 2019, from <https://comtrade.un.org/data>.

³⁰ Agricultural Market Information System Market Monitor. (2018). *AMIS Market Monitor No. 62*. Retrieved March 14, 2019, from http://www.amis-outlook.org/fileadmin/user_upload/amis/docs/Market_monitor/AMIS_Market_Monitor_Issue_62.pdf.

³¹ Agricultural Market Information System Market Monitor. (2019). *Amis Market Monitor No. 65*. Retrieved March 14, 2019, from http://www.amis-outlook.org/fileadmin/user_upload/amis/docs/Market_monitor/AMIS_Market_Monitor_Issue_65.pdf.

³² FAO. (2019a). *Oilseeds, oils, & meals: Monthly price and policy update, January 2019* (p. 8). Retrieved March 14, 2019, from <http://www.fao.org/3/CA3089EN/ca3089en.pdf>.

³³ Ibid.

³⁴ Furthermore, the current African swine fever outbreak in China reduced the demand for feed products, as 1.16 million pigs had to be culled to halt further spreading of the disease.

³⁵ FAO. (2019b). *Oilseeds, oils, & meals: Monthly price and policy update, January 2019* (No. 114) (No. 114; p. 8). Retrieved March 14, 2019, from <http://www.fao.org/3/CA3089EN/ca3089en.pdf>.

³⁶ USDA FAS. (2019a). *China's 2019 No. 1 Agricultural Document Doubles Down on Rural Reforms in the Face of External Pressure and a Slowing Economy*. Retrieved August 12, 2019, from https://gain.fas.usda.gov/Recent%20GAIN%20Publications/China's%202019%20No.1%20Agricultural%20Document%20Doubles%20Down_Beijing_China%20-%20Peoples%20Republic%20of_3-21-2019.pdf.

The US-China trade conflict also impacted Brazilian soy exports. The raise in import taxes on U.S. soy (see [section 4.4.](#)) has shifted China's demand to the Brazilian market. In June 2018, Brazil's soybean prices gained a price premium of USD 90 per tonne over U.S. soybean prices.³⁷ The premium slowly disappeared by early 2019 as Brazil's soy supply remained ample and U.S. soy exports found other markets.

Moreover, the USDA estimates that the global supply of soy will reach a new record high for the 2019/20 international trade year. Meanwhile, demand and consumption of soy is expected to increase slightly in the same timeframe.³⁸ Therefore, global soy prices are expected to stay low in the coming months. In the long term, the outlook of soybean production, trade and consumption will mostly depend on the Chinese consumption trend for feed use. The African swine fever which broke out in late 2018 and wiped out almost 30 percent of swine herds in China, is one of the major factors behind the 9.2 percent cut in Chinese soybean consumption for 2018/19 trade year.³⁹

2.2 Sustainable Development Goals and Soy

2.2.1 Transforming food and land-use systems to achieve the SDGs

In 2015, global leaders adopted a common vision for sustainable development with goals and targets to be achieved by 2030. With the 2030 Agenda and the Sustainable Development Goals countries have committed themselves to time-bound targets for *Prosperity, People, Planet, Peace, and Partnership*, known as the five P's.⁴⁰ They have also adopted 17 SDGs with 169 underlying targets that will require deep transformations in developed and developing countries alike. It will also require important reforms in global supply chains and trade activities.

The Sustainable Development Report 2019 (SDR2019) shows that no country has achieved or is currently on track for achieving the SDGs. Trends on greenhouse gas (GHG) emissions and on threatened species are in fact moving in the wrong direction.^{41,42} Governments need to develop actionable strategies and leverage all available governance tools in order to reach the transformative goals of the 2030 Agenda⁴³. The SDR2019 argues that the SDGs can be operationalized through six SDG Transformations ([Figure 4](#)).

³⁷ Agricultural Market Information System Market Monitor. (2018).

³⁸ USDA FAS. (2019b). *Global Soybean Export Growth Evaporates with Diminished China Demand*. Retrieved August 13, 2019, from <https://apps.fas.usda.gov/psdonline/circulars/oilseeds.pdf>.

³⁹ Agricultural Market Information System Statistics. (2019). *AMIS Market Database*. Retrieved February 25, 2019, from <http://statistics.amis-outlook.org/data/index.html#COMPARE>.

⁴⁰ United Nations. (2019). About the Sustainable Development Goals. *United Nations Sustainable Development*. Retrieved August 12, 2019, from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>.

⁴¹ IPBES. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services. Retrieved August 12, 2019, from <https://www.ipbes.net/document-library-catalogue/summary-policymakers-global-assessment-report-biodiversity-ecosystem>.

⁴² Masson-Delmotte, V., Zhai, P., Portner, H.-O., & Roberts, D. (2018). *An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty - Summary for Policymakers*. Retrieved August 12, 2019, from https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf.

⁴³ SDSN, & OECD. (2019). *Long-term pathways for the implementation of the SDGs: The Governance Implications. Reflection Paper*. Retrieved August 12, 2019, from https://irp-cdn.multiscreensite.com/be6d1d56/files/uploaded/OECD_SDSN-Working-Paper_2019_Final.pdf.

Figure 4 Six SDG Transformations

Source: SDSN and OECD 2019⁴⁴

Today's land-use and food systems are unsustainable in both developed and developing countries. Countries face an environmental crisis resulting from rapid biodiversity loss, GHG emissions, excessive nutrient outflows, chemical pollution, and water stress caused by today's land-use and food systems. The food system also fails to properly nourish billions of people. More than 820 million people are undernourished while 2 billion are overweight or obese together these numbers indicate a global health crisis. At the same time, agriculture and fisheries do not provide sustainable livelihoods, particularly for many farmers, herders, and fishermen. Finally, land-use and food systems are highly vulnerable to climate change, which threatens food supplies and ecosystem services in many countries.^{45,46}

Transformation 4: "Sustainable Food, Land, Water, Oceans" calls for integrated agriculture, climate and health policy interventions. Major interventions are needed to make food and other agricultural or forestry systems more productive and resilient to climate change while also consolidating these efforts with the need to conserve and restore biodiversity and to promote healthy

⁴⁴ SDSN, & OECD. (2019).

⁴⁵ Arneth, A., Barbosa, H., Benton, T., Calvin, K., & Calvo, E. (2019). *IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems - Summary for Policymakers*. Retrieved from https://www.ipcc.ch/site/assets/uploads/2019/08/4.-SPM_Approved_Microsite_FINAL.pdf.

⁴⁶ FABLE. (2019). *Pathways to Sustainable Land-Use and Food Systems. 2019 Report of the FABLE Consortium*. Retrieved August 12, 2019, from http://unsdsn.org/wp-content/uploads/2019/07/2019-FABLE-Report_Full_High-Resolution.pdf.

diets alongside major reductions in food waste and losses. Important trade-offs exist between these interventions, this is why SDR2019 recommends identifying and addressing them inside one transformation. This process will require mobilizing a broad range of ministries, such as agriculture, forestry, environment, natural resources, and health. This broad transformation directly promotes SDGs 2, 3, 6, and 12-15. But many other SDGs are reinforced by these investments.

Any analysis on SDGs should question both positive and negative dimensions of this supply chain governance contributions to the achievement of the SDGs in producing countries (e.g. Argentina, Brazil) but also the impacts embedded into the trade of soy that can be attributed to importing countries (e.g. China and Europe). It is essential to understand how the governance of the soy supply chain can be reformed to curb spill-over effects and align the supply chains with the SDGs and the objectives of the Paris Agreement.⁴⁷

2.2.2 Supply chain spill-over effects and the SDGs

2030 Agenda and the SDGs should not be implemented domestically by outsourcing negative environmental and socio-economic impacts to other countries.⁴⁸ Such international “spill-overs” are pervasive and have been proliferating as the expansion of trade has been exceeding the growth in gross world product.⁴⁹ The SDGs broadly recognize the importance of international spill-over effects with SDG 12 on Responsible Consumption and Production requiring developed countries to take the lead in tackling this issue. Demand for commodities (such as soy or palm oil) in one country can fuel deforestation or water scarcity but also social inequalities in other countries.^{50,51} Tolerance for poor labor standards in international supply chains can harm the poor, particularly women, in many developing countries.⁵² Other types of spill-over effects include those related to security (such as exports of conventional weapons), investments or tax havens and banking secrecy but also official development assistance (ODA) – a positive international spill-over. Positive and negative spill-overs must be understood, measured, and carefully managed since countries cannot achieve the SDGs if spill-overs from other countries counteract their efforts.

The SDR 2019 formulates methods to measure international spill-over effects. The measures that capture environmental and socio-economic spill-over

⁴⁷ Schmidt-Traub, G., Hoff, H., & Bernlohr, M. (2019). *International spillovers and the Sustainable Development Goals (SDGs): Measuring how a country's progress towards the SDGs is affected by actions in other countries*. Retrieved August 12, 2019, from http://unsdsn.org/wp-content/uploads/2019/07/SDSN-Policy-Brief_International-spillovers-and-the-SDGs.pdf.

⁴⁸ SDSN, in collaboration with researchers has been documenting since 2017 progress made and limitations of existing measures to track spill-over effects. Other environmental impacts embedded into trade are available in the SDR 2019 and in the Environmental Impact Index (EII) platform. These include imported CO₂ emissions, NO_x and biodiversity threats. These measures rely extensively on work conducted by a few research centers including ZEF at Bonn University, the Norwegian University of Science and Technology in Trondheim, Sydney University, Stockholm Environment Institute, the Industrial Ecology Virtual Laboratory (IELAB) and Yale Center for Environmental Law & Policy (among others).

⁴⁹ UNEP, Dittrich, M., & Eisenmenger, N. (2015). *International Trade in Resources: A biophysical Assessment*. Retrieved August 12, 2019, from https://www.resourcepanel.org/sites/default/files/documents/document/media/-international_trade_in_resources_full_report_english_0.pdf.

⁵⁰ Lustgarten, A. (2018, November 20). Palm Oil Was Supposed to Help Save the Planet. Instead It Unleashed a Catastrophe. *The New York Times*. Retrieved August 12, 2019, from <https://www.nytimes.com/2018/11/20/magazine/palm-oil-borneo-climate-catastrophe.html>.

⁵¹ Climate Focus. (2019). *NYDF Assessment Partners. Five years after the New York Declaration on Forests: A story of large commitments yet limited progress*. Retrieved from www.forestdeclaration.org.

⁵² ILO. (2014). *Rules of the Game: A brief introduction to International Labour Standards*. Retrieved August 12, 2019, from https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---normes/documents/publication/wcms_318141.pdf.

effects embedded into trade come from Multi-Regional Input-Output (MRIO) databases combined with environmental extensions (for a discussion of methods for measuring trade-related international spill-overs focusing on one specific supply chain see [Annex 7.2](#)). They aggregate across all sectors and commodities and are expressed, in the SDR 2019, in per capita terms to allow comparing countries with different population sizes. Overall, high-income countries generate higher spill-over effects.^{53,54} On a per capita term, Singapore and Switzerland generate the largest amount of negative spill-over effects globally.⁵⁵

China and European countries are linked to negative environmental impacts in Argentina and Brazil through their trade. [Table 1](#) and [Table 2](#) present imported water depletion⁵⁶ and reactive nitrogen emissions⁵⁷ that can be attributed to consumption in China and Germany.⁵⁸ The numbers do not single out impact related to soy; however, the overall level of externalities created in other countries also provides a rough reference for soy supply chain impacts. Only the top 15 countries where China and Germany are linked to the most negative impacts are presented. The year of reference is 2014 (latest available year in the MRIO database EoraFull) and all sectors and commodities are aggregated. Overall, imported water depletion (scarcity weighted) generated by China and Germany in Argentina amounts respectively to 290 and 344 million cubic meters world water equivalents, each year. Argentina is the second country where Germany generates the highest level of water depletion, only outranked by the United States. Imported emissions of reactive nitrogen generated by China and Germany in Brazil amounts to 58 and 73 kilograms respectively each year, while in Argentina it amounts to 48 and 63 kilograms respectively each year. These numbers are influenced by the magnitude of trade flows between countries but also by the production methods and technologies adopted by exporting countries.

⁵³ Sachs, Jeffrey D., G. Schmidt-Traub, C. Kroll, G. Lafortune, and G. Fuller. (2018). *SDG Index and Dashboard Report 2018*. Retrieved August 12, 2019, from https://s3.amazonaws.com/sustainabledevelopment.report/2018/2018_sdg_index_and_dashboards_report.pdf.

⁵⁴ Sachs, Jeffrey D., G. Schmidt-Traub, C. Kroll, G. Lafortune, and G. Fuller. (2019). *Sustainable Development Report*. Retrieved August 12, 2019, from https://s3.amazonaws.com/sustainabledevelopment.report/2019/2019_sustainable_development_report.pdf.

⁵⁵ This is based on quantitative MRIO tables combined with quantitative environmental and social satellite datasets. See more under <https://worldmrio.com/>.

⁵⁶ Measures water embedded into imports (virtual water) weighted by the water scarcity of the region where the imports were produced. The units are Mm3 world water equivalents for the absolute measure and Mm3 world water equivalents per 100,000 population for the per capita measure. Fatal Accidents at work: Measures fatal work-related accidents embedded into imported goods. The indicator attributes fatal accidents in countries with low labor standards to importing countries based on the monetary value of the goods by sector. The units are the number of deaths for the absolute measure and deaths/100,000 population for the per capita measure.

⁵⁷ Measures the total emissions of reactive nitrogen potentially exportable to water bodies and ammonia. Nitrogen emissions stem mostly from crop fertilizer and harm human health notably via aquifer contamination and the environment, notably through eutrophication. The units are kilograms for the absolute emissions and kilograms/100,000 population for the per capita emissions.

⁵⁸ The EII platform does not report EU wide results yet.

Table 1 Bilateral spill-over effects of China for selected environmental impacts

N°	TOP 15	Imported water depletion (Mm3, world water equivalents)	TOP15	Imported emissions of nitrogen (kilograms)
1	USA	1,883,041	USA	367
2	Australia	568,730	Myanmar	240
3	Pakistan	423,169	Ethiopia	165
4	Argentina	290,220	Pakistan	152
5	India	284,782	India	137
6	Indonesia	274,891	Mongolia	125
7	Russia	161,509	Australia	115
8	Ethiopia	159,539	Bangladesh	84
9	Myanmar	122,145	Canada	76
10	Spain	81,883	Brazil	58
11	Turkmenistan	76,099	Thailand	56
12	Iran	72,796	New Zealand	52
13	Thailand	68,935	Russia	49
14	Mongolia	66,323	North Korea	49
15	Egypt	64,972	Argentina	48

Source: SDSN (2019) and Eora Global MRIO (2019) ^{59 60}

Table 2 Bilateral spill-over effects of Germany for selected environmental impacts

N°	TOP 15	Imported water depletion (Mm3, world water equivalents)	TOP15	Imported emissions of nitrogen (kilograms)
1	USA	507,101	USA	131
2	Argentina	343,287	India	129
3	India	316,820	China	106
4	Spain	261,856	France	96
5	Egypt	206,036	Ethiopia	96
6	China	200,603	Brazil	73
7	Pakistan	196,752	Pakistan	68
8	Morocco	166,809	Spain	66
9	Italy	135,295	Argentina	63
10	Turkey	133,632	Nigeria	58
11	Ethiopia	93,776	Italy	47
12	Australia	89,804	Egypt	42
13	Ghana	80,397	New Zealand	41
14	Indonesia	55,633	Netherlands	36
15	South Africa	52,926	Chad	34

Source: SDSN (2019) and Eora Global MRIO (2019) ^{61 62}

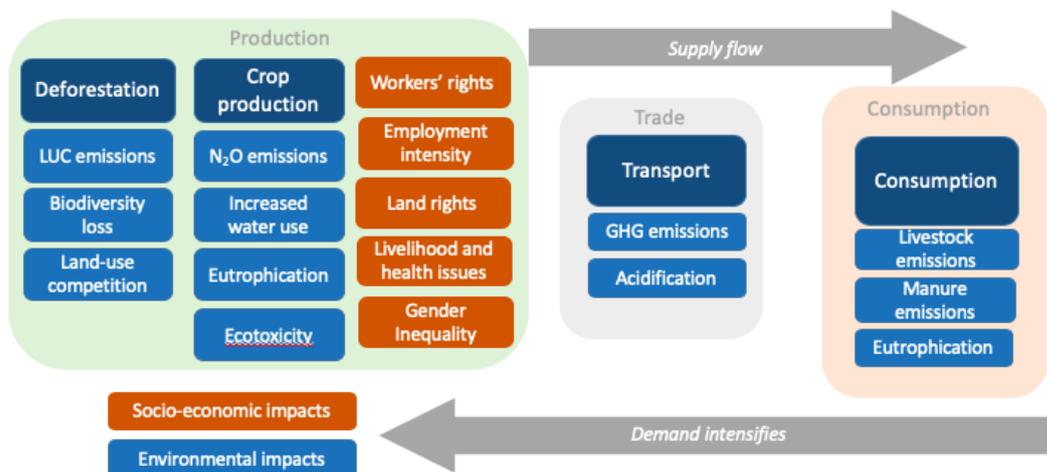
The different stages of the soy supply chain can lead to an array of socio-economic and environmental impacts. These impacts can be subdivided into different impact types and allocated to the various stages of the supply chain (Figure 5). Given the global nature of soy trade, impacts can have major spill-over effects.

⁵⁹ SDSN. (2019). Environmental Impacts and Spillovers. Retrieved August 12, 2019, from <https://spillovers.environmentalimpact.global/#/>.

⁶⁰ Eora Global MRIO. (2019). Retrieved August 12, 2019, from <https://worldmrio.com/>. Eora Global MRIO. (2019).

⁶¹ SDSN. (2019).

⁶² Eora Global MRIO. (2019).

Figure 5 Environmental and Socio-economic impacts according to supply chain stage

The adverse effects of soy are concentrated at the production stage. Figure 5 shows the socio-economic and environmental risks of producing, trading and consuming soy. The life cycle of soy has significant impact on SDGs (Table 3), whereby the concrete impact depends on the geographic location, soil type and use of agricultural practices of a given plantation.⁶³

Soy production can drive the conversion of forest and native vegetation for soy crop production, which significantly contributes to the GHG footprint of the soy supply chain (SDG 13, 15). Soil preparation and the manufacturing of agricultural supplies (e.g. pesticides and fertilizers) for the production of soy also lead to GHG emissions.⁶⁴ Other stages of the soy life cycle also contribute to GHG emissions: soy oil extraction, crude oil refining and biodiesel production lead to substantial emissions. Moreover, the transportation of soy products also leads to considerable emissions. A recent study found that emissions from the transportation of soy from Brazil to the European Union double in comparison to domestic deliveries.^{65 66} In addition, some of these GHG emissions, such as the NO_x emissions resulting from road and transoceanic transport, contribute to ocean acidification and to a lesser extent to eutrophication.

Soil erosion rates, the extensive use of pesticides (particularly Glyphosate) and scale of soybean monocultures pose significant risks to the achievement of SDG 15, particularly in regards to the conservation of ecosystems and

⁶³ Cerri, C. E. P., You, X., Cherubin, M. R., Moreira, Cindy Silva, Raucci, G. S., Castigioni, B. de A., et al. (2017). Assessing the greenhouse gas emissions of Brazilian soybean biodiesel production. *PLoS ONE*, 12(5). Retrieved from <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0176948&type=printable>.

⁶⁴ Pashaei Kamali, F., Meuwissen, M. P. M., de Boer, I. J. M., van Middelaar, C. E., Moreira, A., & Oude Lansink, A. G. J. M. (2017a). Evaluation of the environmental, economic, and social performance of soybean farming systems in southern Brazil. *Journal of Cleaner Production*, 142, 385–394.

⁶⁵ Cerri, C. E. P. et al. (2017).

⁶⁶ Prudêncio da Silva, V., van der Werf, H. M. G., Spies, A., & Soares, S. R. (2010). Variability in environmental impacts of Brazilian soybean according to crop production and transport scenarios. *Journal of Environmental Management*, 91(9), 1831–1839.

natural habitats.⁶⁷ Moreover the application of phosphorus fertilizers also have indirect environmental impacts, as their mining is associated with a range of issues, such as water and air pollution (closely linked to SDG 6), as well as human health risks.⁶⁸ In addition, certain management practices, such as short-term leases for soy production (common in Argentina) create less incentives for producers to maintain soil quality.⁶⁹

The soy supply chain also has socio-economic impacts. The high demand for soy correlates with an increase in land speculation and thereby has also led to higher prices for land, impacting poor communities.⁷⁰ Moreover, although it is not specific to soy, speculators in the Brazilian Cerrado are known to use falsified land titles to illegally lay claim to public lands, thereby denying local communities and smallholders of their access to public land.⁷¹ These issues are closely linked to the SDG 1. Moreover, the soy supply chain is also known to involve illegal employment and labor conditions, sometimes compared to slavery, in countries such as Brazil, China and India.^{72,73} Farm workers are often exposed to health and safety hazards beyond legal limits and lack professional training and health and safety guidance.⁷⁴

The use of monocultures in large areas has also led to less job opportunities for local communities (the larger the area, the smaller the employment per hectare). A study by The Dutch Soy Coalition found that while a typical large-scale soy company only requires 1-2 workers per 400 hectares, small-scale farms in the same area of land would create work for 80 people.⁷⁵ These issues impact SDG 3, 8 and 12 in particular, which aim to ensure good health and well-being, decent work and economic growth, and responsible consumption and production, respectively.

⁶⁷ IDH, & IUCN National Committee of the Netherlands. (2019). *European Soy Monitor: Insights on the European supply chain and the use of responsible and deforestation-free soy in 2017*. Retrieved August 12, 2019, from <https://www.idhsustainabletrade.com/uploaded/2019/04/European-Soy-Monitor.pdf>.

⁶⁸ IDH, & IUCN National Committee of the Netherlands. (2019).

⁶⁹ IDH, & IUCN National Committee of the Netherlands. (2019).

⁷⁰ IDH, & IUCN National Committee of the Netherlands. (2019).

⁷¹ IDH, & IUCN National Committee of the Netherlands. (2019).

⁷² The Dutch Soy Coalition. (2008). *Soy Big Business, Big Responsibility: Addressing the social- and environmental impact of the soy value chain*. Retrieved August 15, 2019, from https://www.bothends.org/uploaded_files/document/2006_Soy_big_business.pdf.

⁷³ Mendelson Lima, Margaret Skutsch, & Gerlane de Medeiros Costa. (2011). Deforestation and the Social Impacts of Soy for Biodiesel: Perspectives of Farmers in the South Brazilian Amazon. *Ecology and Society*, 16(4). Retrieved from <http://dx.doi.org/10.5751/ES-04366-160404>.

⁷⁴ KPMG, IDH, WWF, FMO, & IFC. (2013). *Sustainable Insight: A roadmap to responsible soy*.

⁷⁵ The Dutch Soy Coalition. (2008).

Table 3 Relation between soy production and consumption and SDGs and targets⁷⁶

Soy supply chain concern	SDGs and targets
Deforestation	<p>SDG 15: Life on Land</p> <ul style="list-style-type: none"> •Target 15.1: ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands by 2020. •Target 15.3: combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world. •Target 15.5: reduce degradation of natural habitats and thus the loss of biodiversity by 2020.
	<p>SDG 13: Climate Action</p> <ul style="list-style-type: none"> •Target 13.2: integrate climate change measures into national policies, strategies and planning.
	<p>SDG 1: End poverty in all its forms everywhere</p> <ul style="list-style-type: none"> •By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.
Crop production	<p>SDG 2: Zero Hunger</p> <ul style="list-style-type: none"> •Target 2.3: double the agricultural productivity and incomes of small-scale food producers (...) including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition by 2030. •Target 2.4: ensure sustainable food production systems and implement resilient agricultural practices by 2030. •Target 2.5: 'by 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species.
	<p>SDG 6: Clean Water and Sanitation</p> <ul style="list-style-type: none"> •Target 6.3: improve water quality by reducing its pollution. •Target 6.4: increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity" by 2030.
	<p>SDG 12: Responsible Consumption and Production</p> <ul style="list-style-type: none"> •Target 12.2: achieve the sustainable management and efficient use of natural resources. •Target 12.3: halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses by 2030. •Target 12.4: achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.
Worker's rights	<p>SDG 8: Decent Work and Economic Growth</p> <ul style="list-style-type: none"> •Target 8.8: protect labor rights and promote safe and secure working environment for all workers.
	<p>SDG 3: Good health and well-being</p> <ul style="list-style-type: none"> •Target 3.9: by 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Soy consumption	<p>SDG 8: Decent Work and Economic Growth</p> <ul style="list-style-type: none"> •Target 8.4: improve progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation.
	<p>SDG 12: Responsible Consumption and Production</p> <ul style="list-style-type: none"> •Target 12.7: promote public procurement practices that are sustainable, in accordance with national policies and priorities. •Target 12.8: by 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
Transport	<p>SDG 8: Decent Work and Economic Growth</p> <ul style="list-style-type: none"> •Target 8.4: improve progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation.
	<p>SDG 12: Responsible Consumption and Production</p> <ul style="list-style-type: none"> •Target 12.7: promote public procurement practices that are sustainable, in accordance with national policies and priorities. •Target 12.8: by 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

⁷⁶ United Nations. (2019).

Addressing the negative impacts of the soy supply chain on the SDGs requires analyzing the potential trade-offs between the various SDGs linked to the life cycle of soy products. For example, increasing agricultural productivity to combat hunger (SDG 2) can often have the perverse consequence of increasing deforestation (SDG 15) and negatively affecting local livelihoods if it involves the production of large-scale monocultures (SDG 10).^{77,78} In terms of land use, trade-offs are often related to competing demands for food security, water, land and energy.

When it comes to the soy supply chain, the differences between genetically modified (GM), non-GM and organic (i.e. without the use of fertilizers and pesticides) soybean farming systems can also create different trade-offs. A study shows that GM soy farming has higher productivity and uses fewer pesticides and herbicides and therefore has environmental benefits (SDG 13 and 15). Nonetheless, the use of glyphosate, commonly used in the cultivation of GM soybeans, has been correlated to higher CO₂ emissions from soils, health hazards for farm workers, and a reduced biodiversity. Organic farms are often considered less productive and their need for more land in comparison to conventional farms can lead to a higher carbon footprint; however, it is generally compensated by lower levels of input compared to traditional farms.⁷⁹ Moreover, organic farms have a higher employment requirement, as well as a higher probability to have a higher profitability per ton of soybeans when exported, in comparison to GM and non-GM farms (SDG 3 and 8).⁸⁰ However, the market in certified organic soy represents only 0.03 percent of the Brazilian soy production in 2016 (14,200 tonnes).⁸¹

The SDGs also call for greater policy alignment and coordination. SDG 17 recognizes the need for more cross-sectoral policy coherence, in order to ensure that the global population, estimated to rise to nine billion by 2050, is fed in a manner that guarantees climate resilience and net zero deforestation.⁸² However, most governments operate in siloes with different ministries addressing issues (e.g. energy, agriculture, health) and SDGs separately.

Despite a general understanding of the negative externalities of soy, the quantitative magnitude of soy supply chain impacts in SDG terms remains hard to estimate due to the following factors:

First, each stage of the soy supply chain is composed by a variety of processes and activities. In turn, for each process and activity, there are several alternatives possible, which often lead to a different sustainability impact. The exact sequence

⁷⁷ Timko, J., Le Billon, P., Zerriffi, H., Honey-Rosés, J., de la Roche, I., Gaston, C., et al. (2018). A policy nexus approach to forests and the SDGs: tradeoffs and synergies. *Current Opinion in Environmental Sustainability*, 34, 7–12.

⁷⁸ Mendelson Lima et al. (2011).

⁷⁹ Pashaei Kamali, F. et al. (2017a).

⁸⁰ Pashaei Kamali, F., Meuwissen, M. P. M., de Boer, I. J. M., van Middelaar, C. E., Moreira, A., & Oude Lansink, A. G. J. M. (2017b). Evaluation of the environmental, economic, and social performance of soybean farming systems in southern Brazil. *Journal of Cleaner Production*, 142, 385–394.

⁸¹ International Trade Center, International Institute for Sustainable, & Research Institute of Organic. (2018). *The State of Sustainable Markets 2018: Statistics and Emerging Trends*. Retrieved from

<http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/Sustainability%202018%20layout-FIN-web-v1.pdf>.

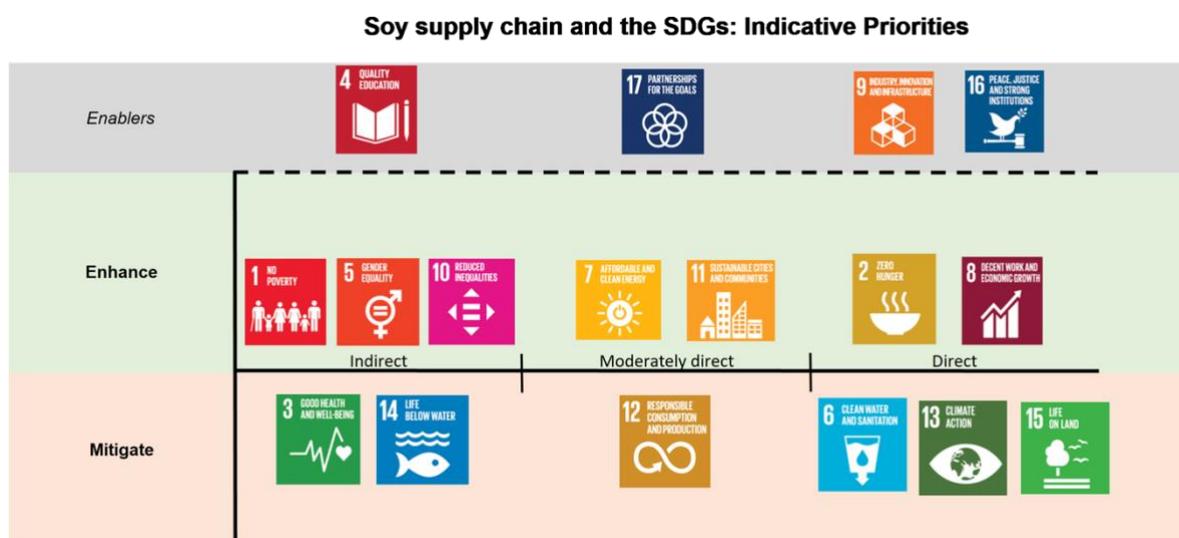
⁸² Nilsson, M., Griggs, D., & Visbeck, M. (2016). Policy: Map the interactions between Sustainable Development Goals. *Nature News*, 534(7607), 320.

of stages, and processes and activities of the soy supply chain, not only differ geographically but also overtime as the soy supply chain is very dynamic.

Second, to assess the soy supply chain impacts in SDG terms, diverse methodologies are available such as the Life Cycle Assessment, Material Flow Accounting or monetary and biophysical hybrid approaches, which can lead to very different results ([Annex 7.2](#)). The methodologies vary on the scope of the system assessed and the rules of attribution of its impacts.

The SDGs provide a sound framework to understand the impact of the soy supply chain on economic, social and environmental outcomes. [Figure 6](#), provides some “Indicative Priorities” to track positive and negative impacts that can be generated by the soy supply chains that need to be respectively enhanced and mitigated.

Figure 6 Soy supply chain and the SDGs: Indicative Priorities



On the positive side, the soy supply chain has a very direct impact on food supply (SDG 2: No Hunger) and economic activity (SDG 8: Decent Work and Economic Growth) in both producing and importing countries. The soy supply chain should also strive to enhance the use of clean energy (SDG 7: Affordable and Clean Energy) and the transition to sustainable cities and regions (SDG 11: Sustainable Cities and Communities). More indirectly, it can help alleviate poverty and address various forms of inequalities including income and gender inequalities through decent work conditions for farmers (covered under SDG1: No Poverty; SDG 5: Gender Equality and SDG 10: Reduced Inequalities).

At the same time, the soy supply chain should mitigate potential negative SDG impacts. Soy imports from Europe and China (and other parts of the world) can lead to increased deforestation and resource use (including water) in producing countries that affect negatively the achievement of SDG6: Clean Water and Sanitation, SDG 13: Climate Action and SDG 15: Life on Land. Similarly, SDG 12 (Responsible Consumption and Production) calls for a long-term programme on sustainable consumption and production and the efficient use of

natural resources with “developed countries taking the lead” (Target 12.1). As such, developed countries should strive to mitigate their negative “spillover effects” embodied in their consumption and diets to other countries. Finally, more indirectly, the soy supply chain should aim to mitigate its impact on SDG3 (Good Health and Well-Being) and SDG 14 (Life Below Water) through decent work conditions, sustainable diets and reduced pollution and waste.

Some of the SDGs can act as enablers for change. SDG 9 (Industry, Innovation and Infrastructure) and SDG 16 (Peace, Justice and Strong Institutions) can support the transition towards more sustainable supply chains through targeted innovation and better infrastructure as well as better governance and implementation mechanisms that provide clear rules, standards and incentives for producers and consumers. Trade partnerships and bilateral agreements, covered under SDG 17 (Partnerships for the Goals), can also help promote more sustainable supply chains. Finally, awareness events, training and education, covered under SDG 4 (Quality Education) can support the transition to more sustainable and efficient agricultural systems in producing countries and more sustainable diets in importing countries.

To illustrate the sustainability impact of soil, we elaborate in the following on the case of deforestation, as its magnitude renders it one of the most relevant SDG impacts of soy production.

2.2.3 Deforestation imported into the EU and China

The rising demand for soy products has caused an expansion of soy production in forest areas, particularly in the Amazon and the Cerrado region of Brazil. From 2000 to 2014, agricultural land, primarily for soybean production, expanded by 87 percent in the tropical savannah ecoregion of the Cerrado. In 2016, soybean production covered 90 percent of the agricultural land in the region. Deforestation levels in the Cerrado region have surpassed the ones in the Amazon since 2010, with Matopiba⁸³ being the hotspot of soy expansion, followed by Mato Grosso. Soy expansion is also associated with indirect land-use change, in particular with cattle pasture expansion which eventually is converted into cropland for soy production.

In Brazil, in the last eleven years, more than 2 million hectares of forests and native vegetation – an area the size of El Salvador – has been cleared to grow soy. More than 80 percent of the deforestation happened in the Cerrado biome where loss of native vegetation remains high.⁸⁴ Similarly, soy has been a major driver of deforestation in the Chaco, a 110-million-hectare ecoregion extending into Argentina, Bolivia, and Paraguay, which has lost about 8 million hectares in 2000-12 period – especially in Argentina where soy cultivation expanded by 2.4 million hectares between 2000 and 2012 at the cost of forests.⁸⁵

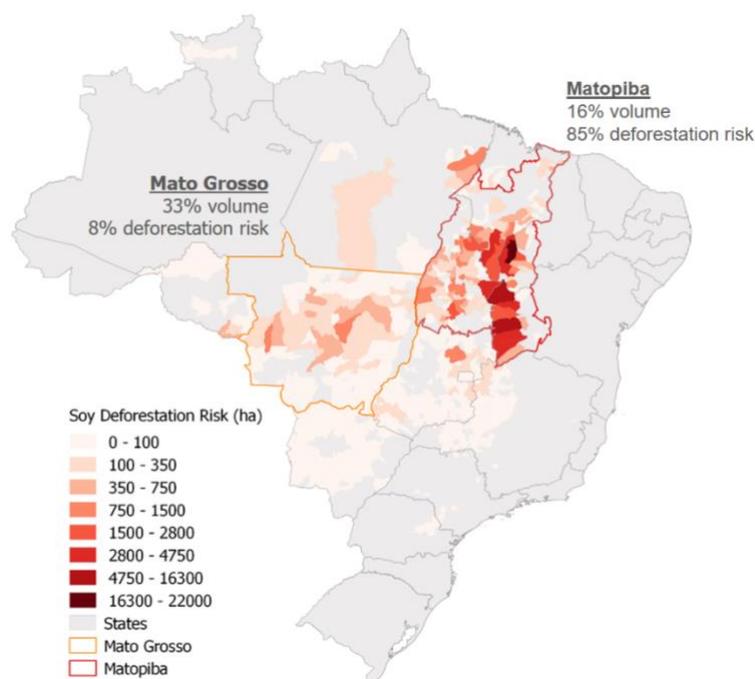
⁸³ Matopiba is used to designate the region of Maranhao, Tocantins, Piaui and Bahia.

⁸⁴ Asher, C. (2019, April 3). Brazil soy trade linked to widespread deforestation, carbon emissions. *Mongabay Series: Amazon Agribusiness*. Retrieved from <https://news.mongabay.com/2019/04/brazil-soy-trade-linked-to-widespread-deforestation-carbon-emissions/>.

⁸⁵ Asher, C. (2019, April 3). Brazil soy trade linked to widespread deforestation, carbon emissions. *Mongabay Series: Amazon Agribusiness*. Retrieved from <https://news.mongabay.com/2019/04/brazil-soy-trade-linked-to-widespread-deforestation-carbon-emissions/>.

A lot of that deforestation is exported to other countries. As a highly traded commodity, soy accounts for more than a fifth of total deforestation embedded in export of agricultural commodities to meet international demand.⁸⁶ Several countries with low national deforestation rates or even an increase in forest cover – most notably China and the EU – offset much of their gain in carbon stocks by imports of embedded deforestation,⁸⁷ a typical case of SDG spill-over effect. Both the EU and China as major soy trade partners of Brazil and Argentina therefore have a significant impact on global deforestation.

Figure 7 Map of the EU's imports soy embedded deforestation risk in Brazil (2013-2017)



Source: Trase⁸⁸

Trase, a digital tool for exploring supply chains, makes it possible to better understand the links between import markets and subnational production regions and therefore to see where commodity production is linked to deforestation risks. Figure 7 from Trase shows that the deforestation risks associated with the EU's soy imports from 2013 to 2017 are localized in a limited number of municipalities in Matopiba and Mato Grosso. Although only 16 percent of the EU soy imports over this time period came from Matopiba, it represented 85 percent of the soy embedded deforestation risk. Furthermore, only ten municipalities⁸⁹ provide 48 percent of the EU's deforestation risk embedded in imported soy.⁹⁰ Similarly, Germany's soy deforestation risk from imports from Brazil

⁸⁶ Pendrill, F., Persson, U. M., Godar, J., & Kastner, T. (2019). Deforestation displaced: trade in forest-risk commodities and the prospects for a global forest transition. *Environmental Research Letters*, 14(5), 055003.

⁸⁷ Pendrill, F. et al. (2019).

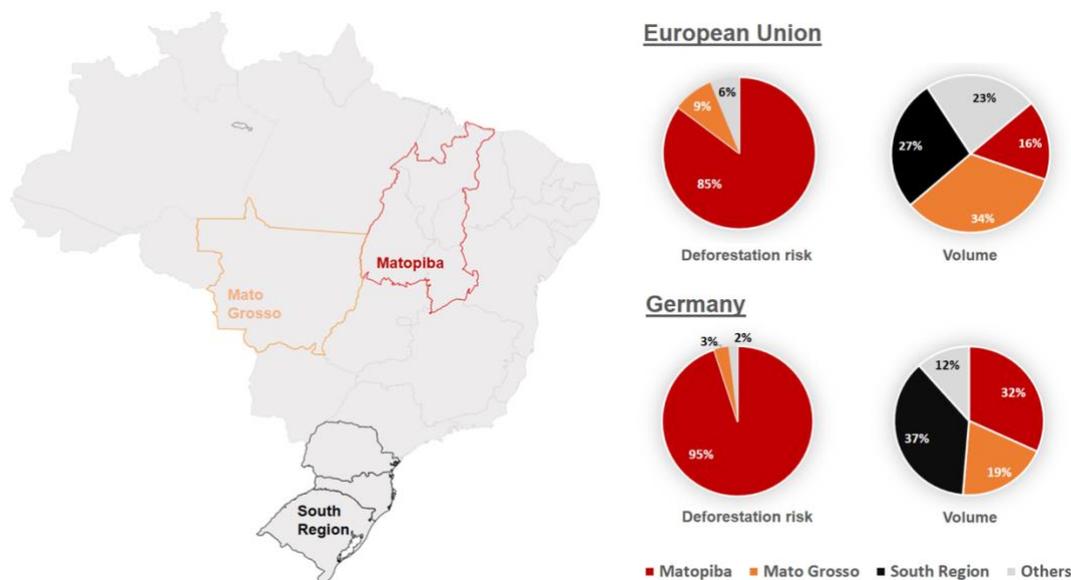
⁸⁸ TRASE. (n.d.-a). Retrieved March 15, 2019, from <https://trase.earth/>.

⁸⁹ The 10 municipalities are Baixada Grande do Ribeiro, Formosa do Rio Preto, Sao Desiderio, Ribeirao Goncalves, Santa Filomena, Riachao das Neves, Gilbues, Mateiros, Balsas, Correntina.

⁹⁰ Trase's soy deforestation risk for the Cerrado is calculated by taking 1) total deforestation (associated with soy) during the previous five years in this jurisdiction and averaged by the soy area in this jurisdiction (ha), and by 2) allocating that ratio value to the companies or countries importing from the jurisdiction for that same period based on the proportion of the volumes they purchase.

come mainly from Matopiba, which represents a third of Germany's soy imports but 95 percent of the soy embedded deforestation risk (Figure 8).

Figure 8 Imports by the EU and Germany – Soy embedded deforestation risk in Brazil (2017)



Source: Trase⁹¹

Last year, the EU imported 15 million tonnes of soybeans and 18 million tonnes of soy meal to feed poultry, pigs and cattle. Almost a third of soybeans imported into the EU comes from Brazil, and 80 percent of soy meal comes from Brazil and Argentina.⁹² Between 1990 and 2008, the EU imported and consumed an estimated 9 million hectares of deforested area - more than a third (36 percent) of deforestation embedded in the global trade of crops and livestock.⁹³ Of this, almost half (47 percent) was deforestation from soybean and the rest from other important commodities including livestock, palm oil, cocoa, coffee and rubber. Greenhouse gas emissions from deforestation embedded in oilseeds, mostly soy imported into the EU account for almost a quarter (23 percent) of carbon footprint of average diets in the EU.⁹⁴ Studies also indicate that several producers in Brazil and Argentina illegally deforest protected areas of land. In Argentina, 40 percent of soybean areas come from areas which previously were primary forests.⁹⁵

The opening of the Chinese market has drastically increased demand for soybean in Brazil. Between 2013 and 2017, China purchased 42 percent of Brazil's soybeans which accounted for loss of 223,000 hectares of forest – an area two times the size of New York City – mostly in the Cerrado.⁹⁶ The recent trade tariff spat between U.S. and China can further accelerate this process. The tariffs imposed by the U.S. administration on Chinese products and China's retaliation,

⁹¹ TRASE. (n.d.-a).

⁹² EU Crops Market Observatory. (2019, August 14).

⁹³ Cuypers, D., Lust, A., Geerken, T., Gorissen, L., Peters, G., Karstensen, J., et al. (2013). *The impact of EU consumption on deforestation: comprehensive analysis of the impact of EU consumption on deforestation: final report*. (Technical Report No. 2013-063) (Technical Report No. 2013-063). Retrieved March 22, 2019, from <http://dx.publications.europa.eu/10.2779/82226>.

⁹⁴ Sandstrom, V., Valin, H., Krisztin, T., Havlik, P., Herrero, M., & Kastner, T. (2018). The role of trade in the greenhouse gas footprints of EU diets. *Global Food Security*, 19, 48–55.

⁹⁵ Dalgaard, R. et al. (2008).

⁹⁶ Lazzeri, T. (2019, April 16). Tracking China's soy footprint in Brazil. Retrieved from <https://dialogochino.net/25882-tracking-chinas-soy-footprint-in-brazil/>.

particularly on American soybean imports, has resulted in Brazil filling about 75 percent of China's soybean demand. And if Brazil were to continue to meet China's demand alone, soybean production in Brazil could increase up to 39 percent and convert another 13 million hectares of natural vegetation.⁹⁷ This soy expansion could affect both the Cerrado and the Amazon, either directly or through displacement of pasturelands.

A wide range of environmental public policies have been adopted during the recent decades in Brazil. The most important national policies are the National Climate Change Policy established in 2009, the New Forest Code in 2012, and the National System of Conservation Units and Protected Areas in 2000. The two major public policies to combat deforestation are the Action Plan for Deforestation Prevention and Control in the Legal Amazon (PPCDAm), adopted in 2004, and Action Plan for Prevention and Control of Deforestation and Forest Fires in the Cerrado (PPCerrado), adopted in 2010. Brazil also has an ambitious GHG limitation goal of reducing GHG emissions by 37 percent below the 2005 emissions level under the Paris Agreement. Reducing deforestation is essential to meet that goal. However, due to more recent political developments in Brazil, under the Temer administration (2016-18) and more recently the Bolsonaro administration (2019-), significant loss of political support and budget cuts to Brazil's environmental policies, enforcement and agencies threaten their effectiveness.⁹⁸

There are the first signs of deforestation skyrocketing in the Amazon as massive forest fires spread putting at risks previous successes. Brazilian official reports released by the National Institute for Space Research (INPE), Brazil's federal monitoring agency, indicate that deforestation has sky-rocked in the Amazonia since the beginning of the dry season in May 2019. Furthermore, an 88 percent increase in deforestation has been reported in June 2019, compared to the same month in 2018 and a similar increase is reported in the first half of July.⁹⁹ Despite the alerts, provided by Deter, INPE's monitoring system, authorities have been reluctant to act and stop the deforestation and instead have accused INPE of data manipulation. Now, there are increasing concerns regarding the future of Deter as the director of INPE has been dismissed and Brazilian authorities are exploring the use an alternative private system instead.¹⁰⁰ In reaction, Norway and the German Ministry of Environment, Nature Protection and Nuclear Safety, the biggest providers to REDD+ Amazon Fund, have now decided to suspend their next contribution of USD 33.2 million and USD 39 million respectively. Moreover, there are now some concerns that there might be some repercussions for the Mercosur-EU trade agreement as some European countries might condition the agreement ratification on Brazil's government taking effective actions to reach its

⁹⁷ Fuchs, R., Alexander, P., Brown, C., Cossar, F., Henry, R. C., & Rounsevell, M. (2019). Why the US–China trade war spells disaster for the Amazon. *Nature*, 567(7749), 451–454.

⁹⁸ Lucas Ferrante, & Philip Fearnside. (2019). Brazil's new president and 'ruralists' threaten Amazonia's environment, traditional peoples and the global climate. *Environmental Conservation*, Page 1 to 3.

⁹⁹ Philip M. Fearnside, C. (2019, July 29). Brazilian Amazon deforestation surge is real despite Bolsonaro's denial (commentary). *Mongabay Series: Amazon Conservation*. Retrieved from <https://news.mongabay.com/2019/07/brazilian-amazon-deforestation-surge-is-real-despite-bolsonaros-denial-commentary/>.

¹⁰⁰ Karla Mendes. (2019, August). Future of Amazon deforestation data in doubt as research head sacked. *Mongabay Series: Amazon Conservation, Amazon Illegal Deforestation*. Retrieved from <https://news.mongabay.com/2019/08/future-of-amazon-deforestation-data-in-doubt-as-research-head-sacked/>.

commitments under the Paris Agreement.¹⁰¹

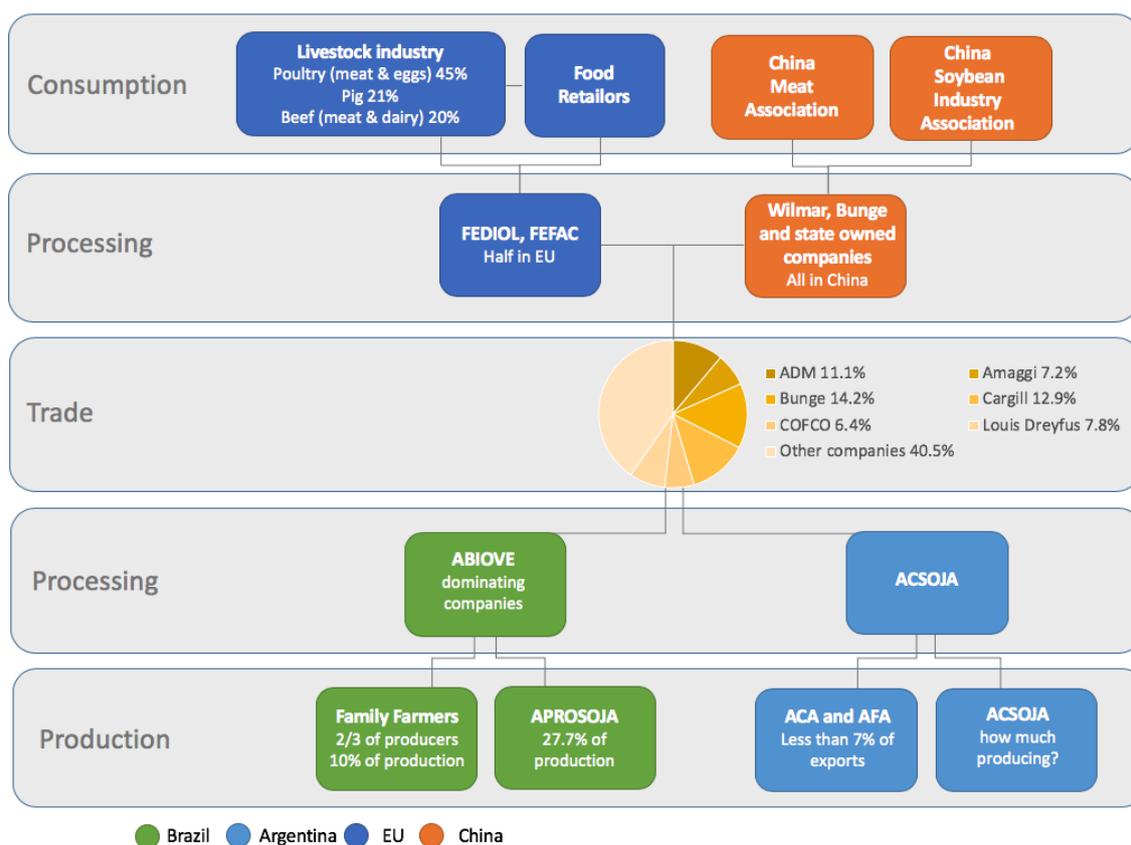
¹⁰¹ Sue Branford. (2019, August). Norway freezes support for Amazon Fund; EU/Brazil trade deal at risk? *Mongabay Series: Amazon Conservation*. Retrieved from <https://news.mongabay.com/2019/08/norway-freezes-support-for-amazon-fund-eu-brazil-trade-deal-at-risk/>.

3. Main stakeholders and agents of change

The global soy supply chain is characterized by a high level of vertical integration. In particular the stage of milling, processing and trading and to lesser extent production are dominated by a few global agribusiness companies. In the case of Brazil and Argentina, six companies, ADM, Amaggi, Bunge, Cargill, China National Cereals, Oils and Foodstuffs Corporation (COFCO), and Louis Dreyfus dominate 54.3 percent of the soy exports. In the EU almost half and in China almost all of the soy milling is undertaken domestically. [Figure 9](#) provides an overview over the main actors from the EU and China, Brazil and Argentina, and their role in the soy supply chain.

Governments are essential actors as they define production and procurement standards for soy and soy products. They are also committed to international and national climate, biodiversity and sustainability goals under the Paris Agreement, the Convention of Biological Diversity, the Convention to Combat Desertification and the SDGs. Civil society plays an important role to raise awareness of the link between soy production and deforestation, push companies and governments to take action to improve soy production, and eliminate embedded pollution, violation of labor standards, and deforestation from the soy supply chain. This section maps the main actors active or exercising influence in the soy supply chain and concludes with a summary of relevant SDG reporting of main actors.

Figure 9 Stakeholders in the supply chain



3.1 Global actors

The United Nations support soy sustainability efforts through various agencies. The Food and Agriculture Organization collects and disseminates important data on production and trade and operates a Sustainable Food Value Chains Knowledge Platform.¹⁰² The UN Development Programme manages the Green Commodities Programme and hosts the New York Declaration on Forests (NYDF) Global Platform. UNDP also actively works with countries to reflect nature-based climate solutions in the Nationally Determined Contributions under the Paris Agreement. UN Environment works through its financial initiative (UNEP FI) to attract investments into sustainable supply chains.

Public-private platforms promoting deforestation-free soy include the Tropical Forest Alliance (TFA) and UNDP's Green Commodities Programme, among others. The Tropical Forest Alliance has initially been established by the Consumer Goods Forum and the U.S. government (USAID) with the objective of eliminating deforestation from agricultural commodities, including soy. The Green Commodities Programme has been established with a similar purpose to address sustainability challenges of highly-traded commodities. While TFA emphasizes company action, UNDP works with governments to create national environments where sustainable commodity sectors can operate.

¹⁰² FAO. (n.d.). Sustainable Food Value Chains Knowledge Platform | Food and Agriculture Organization of the United Nations. Retrieved September 30, 2019, from <http://www.fao.org/sustainable-food-value-chains/home/en/>.

Companies are organized in the Consumer Goods Forum (CGF) and the World Business Council on Sustainable Development (WBCSD). The CGF has committed to zero-net deforestation by 2020 and supports sustainable supply chains, social and environmental efforts.¹⁰³ The WBCSD targets the realization of the SDGs through six work programs to achieve systems transformation.¹⁰⁴ WBCSD also convenes the Soft Commodities Forum.

There a number of civil society actors that work on reducing the environmental impact of soy across various geographies. The World Wildlife Fund for Nature (WWF), for example, is actively promoting sustainable soy production in Brazil and Argentina, and advocates demand-side measures in the EU and China. The WWF also helped to establish the Roundtable for Responsible Soy (RTRS) in 2005. RTRS and Proterra Foundation are the major certification schemes for sustainable soy. Other global NGOs active in soy include The Nature Conservancy (TNC), Greenpeace, and the National Wildlife Federation. Organizations like CDP push for company reporting and transparency and help to monitor sustainability commitments of companies. The Trase initiative of Global Canopy and the Stockholm Environmental Institute helps mapping imports to production areas and deforestation. The recent Accountability Framework Initiative formulates common standards for the reporting of supply-chain commitments among companies.

The financial sector, while generally lagging behind in taking supply-chain action, has taken the first step to eliminate deforestation from its portfolio. In March 2019, investors with USD 6.3 trillion in assets call on companies to cut climate, deforestation-related risks in global soybean supply chains.¹⁰⁵ The call has been coordinated by Ceres, an NGO working with investors on tackling sustainability challenges. In 2019, Sim Finance and BVRio jointly with international partners have launched the Responsible Commodities Facility which will focus on sustainable soy and corn in Brazil.¹⁰⁶ The Facility offers a combination of innovative financial tools, increased transparency and traceability, and a focused effort on compliance with strict guidelines, to accelerate the growth of responsible commodities in Brazil.

3.2 Brazil

In Brazil, soybean production involves almost a quarter of a million farms producing soybeans. Typically, a soybean plantation is 130 hectares in size (2017 average). While more than two-thirds of soy farmers are family farmers, they only account for 10 percent of the soybean planted area.¹⁰⁷ Almost all (90 percent) Brazilian soy is produced by large agro-businesses. For instance, while the Association of Producers of Soybeans of the State of Mato Grosso (APROSOJA)

¹⁰³ The Consumer Goods Forum. (n.d.). *The Consumer Goods Forum*. Retrieved September 30, 2019, from <https://www.theconsumergoodsforum.com/>.

¹⁰⁴ World Business Council for Sustainable Development (WBCSD). (n.d.). *World Business Council for Sustainable Development (WBCSD)*. Retrieved September 30, 2019, from <https://www.wbcsd.org/>.

¹⁰⁵ Investors with \$6.3 trillion in assets call on companies to cut climate, deforestation-related risks in global soybean supply chains. (2019, March 7). *Ceres*. Retrieved September 30, 2019, from <https://www.ceres.org/news-center/press-releases/investors-63-trillion-assets-call-companies-cut-climate-deforestation>.

¹⁰⁶ Responsible Commodities Facility. (n.d.). *The Lab: Driving Sustainable Investment*. Retrieved September 30, 2019, from <https://www.climatefinancelab.org/project/responsible-commodities-facility/>.

¹⁰⁷ Sistema IBGE de Recuperação Automática - SIDRA. (2016). Retrieved August 12, 2019, from <https://sidra.ibge.gov.br/Busca?q=soja>.

has only 5,000 corporate and individual members, they are responsible for around 27.7 percent of the national soybean production.¹⁰⁸ They play an important role in representing soy producers interests in different multi-stakeholder sustainability initiatives such as the Cerrado Working Group and the Amazon Soy Moratorium.

The soybean crushing and primary vegetable crude oil and meal extraction is dominated by 13 companies. These companies constitute ABIOVE, the Brazilian vegetable oil industry association founded in 1981. Those same companies also play an important role in other stages of the soy supply chain. In particular, six of those companies, namely ADM, Amaggi, Bunge, Cargill, COFCO and Louis Dreyfus jointly account for over 59.6 percent of Brazil's soy and soy products exports in 2017.

The Brazilian government regulates the soy supply chain activities through the land-use regulatory framework. The most important piece of land-use regulation is the Forest Code and with it a land registry known as the Environmental Rural Registry (CAR) in Brazil. The Forest Code regulates the use of production inputs, e.g. authorizing GM seed varieties and herbicides. The government also actively subsidizes soy production financially, e.g. through loans by the Plano Safra program, and non-financially, e.g. through research and extension services by the Brazilian Agricultural Research Corporation known as EMPRABA.

Civil society organizations play an essential role in raising public awareness on soy supply chain sustainability issues. They mobilize public and private actors to participate in multi-stakeholders initiatives and policy reforms. WWF has been particularly active in promoting an agreement towards sustainability and no-conversion of forests in the Cerrado. Greenpeace has been instrumental in the adoption of the Soy Moratorium a public-private initiative ensures that soy from the Amazon is free from deforestation, slave labor or threats to indigenous lands. The Nature Conservancy provides satellite imagery and assists with CAR registration and the environmental regularization of rural properties. TNC also supports restoration efforts through the Greener Soybean project in Mato Grosso and the More Sustainable Soy in Pará. There are also multi-stakeholder groups such as the Brazilian Coalition on Forests and Agriculture that foster dialogue among its members.

3.3 Argentina

Argentina's soy supply chain is dominated by large international companies, which dominate the production capacity of each stage of the supply chain. The leading soybean exporting companies in Argentina are Aceitera General Deheza, Bunge, Cargill, COFCO, Louis Dreyfus and Vicentin, which jointly account for 61.9 percent of the soybean 2017 exports. Many of these companies are also the leading companies in terms of crush capacity.

¹⁰⁸ Brazilian soy producers and processors and the European feed and vegetable oil industry agree on Joint Action Plan towards responsible soy production and trade. (2017, January 19). Retrieved August 12, 2019, from <https://www.fefac.eu/files/72556.pdf>.

In addition, there are a number of major domestic actors which also play an important role at the different stages of the supply chain, such as major farmer groups. The Asociación de Cooperativas de Argentina (ACA) and Agricultores Federados Argentinos (AFA) are involved in all stages of the supply chain and represent almost 7 percent of total exports in 2017.¹⁰⁹ The main actors of the Argentinian soybean supply chain are organized in ACSOJA, the Argentinian soybean supply chain association founded in 2004. This association is a representative body for the actors involved in the Argentinian soy supply chain and its principal role is to enable the dialogue among its members as well as lobbying government organs in charge of policy making. ACSOJA is made of soy farmers associations, soy processors and traders, civil society organizations, research centers and financial institutions involved in the soybean supply chain.¹¹⁰

The Argentine government actively supports soy production and exports which represent 5.5 percent of the national GDP in 2014.¹¹¹ The government favorably treats soy by cutting soy export taxes, and works with the EU and the Government of China to address any constraint that the Argentinian soy supply chain actors are facing. Government agencies also enforce the forest law and territorial land-use legal instruments. The National Agricultural Technology Institute (INTA in Spanish) supports the development and dissemination of new technologies and best practices.

Civil society has so far played a limited role, mostly related to raising public awareness and data transparency. NGO focus has been on topics related to chemical use and land socio economic issues in soy production.

3.4 EU

In the EU, the processing, manufacturing and retailing stages of the supply chain are generally country-specific as are relevant industry associations. The EU's soybean imports are dominated by a few transnational companies. The main soybean importing companies into the EU differ for Brazil and Argentina (see also [Table 4](#)). For Brazil, the main importing companies are: ADM, Amaggi, Bunge, Cargill, Coamo. They account for 57.15 percent of all Brazilian imports into the EU. For Argentina, the main importing companies are: COFCO, Glencore, Louis Dreyfus, Aceitera General Deheza and Vicentin. They account for 65.82 percent of all Argentinian imports into the EU. Together, the five main importing companies for Brazil and Argentina accounted for 38.24 percent of the EU's 2017 imports.¹¹²

Soy production in the EU varies across countries, but focusses on non-GM soybeans. Processors are organized in several sectoral associations and bodies, such as FEDIOL, the EU level association that groups protein meal and vegetable oil national associations, or FEFAC, the European feed manufacturers federation.¹¹³ National governments also play an essential role. They regulate soy import requirements (e.g. due diligence laws adopted in France and the UK) and

¹⁰⁹ TRASE. (n.d.-b). Retrieved August 12, 2019, from <https://trase.earth/>.

¹¹⁰ ACSOJA. (2016). Sectores. Retrieved August 12, 2019, from <http://www.acsoja.org.ar/sectores/>.

¹¹¹ Bianchi, E., & Szpak, C. (2017). *Soybean prices, economic growth and poverty in Argentina and Brazil: Background paper to the UNCTAD-FAO Commodities and Development Report 2017 Commodity Markets, Economic Growth and Development*.

¹¹² United Nations Department of Economic and Social Affairs. (2019).

¹¹³ FEFAC. (n.d.). Responsible Sourcing. FEFAC. Retrieved August 12, 2019, from <https://www.fefac.eu/fefac-positions/sustainability/21551/>.

formulate national agricultural strategies. Spearheaded by the German and the Hungarian governments, 15 European states have adopted a Soy Declaration under which they promote the cultivation of protein crops (legumes such as soy, broad beans, peas and lupins, and clover species such as alfalfa). In Germany, the Soy Declaration is implemented through the Protein-Crop Strategy which dates back to 2012.¹¹⁴ In Germany, the area of land under pulses has increased over the last years, but remains with around 188,000 hectares (2017) very small.

The EU Parliament and member states argue for EU-wide protein strategy.

Over the last 15 years, the EU Parliament has on a number of occasions spoken about proteins and the need for a European protein plan. This call for action has been backed by a number of member states (e.g. France). In 2018, the EU Commission published a report on plant-based proteins in the Union.¹¹⁵ The report finds that promoting plant protein production would provide economic benefits for farmers and a number of environmental and climatic advantages (e.g. through the fixing of nitrogen in soils). However, the EU Commission also highlights the fact that agronomic conditions in Europe are not optimal for large-scale production of plant proteins.

EU governments have also committed to improving soy sustainability in their imports. Germany, France, UK, Denmark, Italy, the Netherlands and Norway have backed the Amsterdam Partnership Declaration. The Amsterdam Partnership is committed to deforestation-free, sustainable commodities and support learning across national initiatives for trade in sustainable commodities and promote policy coordination and synergy between supply chain and landscape-level initiatives in producer countries.¹¹⁶ In 2019, the EU Commission has embarked on a process that evaluates policy instruments that would reduce forest degradation and destruction triggered by EU's imports.^{117,118}

In the EU, NGOs play an important role in raising awareness on the negative externalities of soy production. Civil society organizations push for sustainable standards and commitments to improve the sourcing of companies which are purchasing and trading soy from biomes threatened by deforestation. In addition, research centers and university institutes are part of multi-stakeholder initiatives to develop the information and analysis necessary to monitor and support the progress by corporate actors. Organizations such as WWF are very important advocacy voices for reducing the import of embedded deforestation, while others monitor company commitments towards soy sustainability (e.g. Global Canopy, CDP).

¹¹⁴ European Soy Declaration signed. (2017, July 17). *Federal Ministry of Food and Agriculture*. Retrieved September 30, 2019, from https://www.bmel.de/EN/Agriculture/Plants/_Texte/Europ%C3%A4ischeSojaErkl%C3%A4rung_EN.html.

¹¹⁵ European Commission. (2018). *Report from the Commission to the Council and the European Parliament on the development of plant proteins in the European Union* (No. COM/2018/757 final) (No. COM/2018/757 final). Retrieved September 30, 2019, from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018DC0757>.

¹¹⁶ Amsterdam Declarations Partnership. (n.d.). *Amsterdam Declarations Partnership*. Retrieved September 30, 2019, from <https://ad-partnership.org/>.

¹¹⁷ European Commission. (2019, July 23). *Communication: Stepping up EU action to protect and restore the world's forests*. Retrieved August 12, 2019, from https://ec.europa.eu/info/sites/info/files/communication-eu-action-protect-restore-forests_en.pdf.

¹¹⁸ Deforestation and forest degradation – stepping up EU action. (n.d.). Retrieved August 12, 2019, from https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-6516782_en.

3.5 China

China's soybean supply chain is vertically integrated with a complex set of shareholdings, as major companies own shares of other companies along the different stages of the supply chain. Additionally, major stages of the soybean supply chain are dominated by few -often state-owned- companies. Together, state-owned companies (as Sinograin, Chinatex, Nobli Group, COFCO) account for more than 26 percent of the soybean crushing industry market in China.¹¹⁹

Next to the state-owned companies, major associations such as the China Soybean Industry Association and China Feed Industry Association, play key roles in the supply chain. These associations have strong links to government institutions and public research centers and universities. Universities are important voices as they support ministries such as the Ministry of Commerce and the Ministry of Ecology and Environment in the development of policies.

China's soybean imports are dominated by a few transnational companies. For Brazil and Argentina imports, the most important companies are ADM, Bunge, Cargill, COFCO and Louis Dreyfus, which are responsible for 54.72 percent of imports from Brazil and 45.21 percent of imports from Argentina. COFCO, a Chinese public company and also one of the largest food trader, processor, and manufacturer has recently taken a position in the soybean supply chain. Since 2014, it has executed several main acquisitions of major soybean traders, and in 2017 was already responsible for 7.75 percent of Chinese soybean imports from Brazil and 14.25 percent from Argentina.¹²⁰

Chinese government agencies regulate many of the essential elements related to soy trade, transformation and consumption. They also directly influence imports through sectoral policies laid out in policies briefs such as the No. 1 Central Document. This document, first policy statement released by central authorities each year, is seen as an indicator of policy priorities.¹²¹ In terms of sustainability, the Chinese government has traditionally been less concerned about the international impact of imported soy and instead focused its attention -so far- on matters related to food security and consumers' health. However, this is changing as state-owned Chinese companies (most notably COFCO) have become more concerned about sustainability in their operations.

3.6 SDG reporting of main stakeholders

Soy supply chain impacts need to be incorporated in national SDG monitoring, in business assessments and corporate ratings. Project developers should also evaluate carefully the potential SDG impacts of specific interventions. Official SDG monitoring at the country level focuses primarily on domestic implementation, leaving aside, to a large extent, spill-over effects and international supply chains. Typically, besides ODA, few measures of international spill-over effects are included and discussed in national SDG monitoring reports and Voluntary National Reviews (VNRs).

¹¹⁹ Solidaridad. (2016). 10 August 2019

¹²⁰ Solidaridad. (2016).

¹²¹ USDA FAS. (2019a).

In Europe, the official SDG monitoring report produced annually by the European Commission via Eurostat does not cover the EU's foreign actions (besides ODA). The lead EU monitoring report on the SDGs “Sustainable Development in the European Union” produced annually by Eurostat tracks performance against a well-designed indicator framework drawing primarily on official Eurostat statistics, as well as statistics from other official and non-official sources. Yet, according to a survey conducted by SDSN in 2018, the lack of measures to capture EU's spill-over effects on the rest of the world (embedded into consumption of EU citizens) is the most important limitation of the Eurostat report.¹²² At the country level, SDG indicators developed by individual EU member states also often fail to consider consumption-based metrics.

Voluntary National Reviews tend to provide a useful list of initiatives and country programs but fail to monitor closely country impacts along the supply chains. For example, while the recent 2019 VNR of the United Kingdom of Great Britain and Northern Ireland (UK) presented at the High-Level Political-Forum in July 2019 provides some data on UK actions to address modern slavery and human trafficking in its supply chains, it failed to look at sustainability impacts of agricultural supply chains. Soy – or related supply chains – are not mentioned. Beyond VNRs, municipalities are also increasingly encouraged to report about their efforts to implement the SDGs.

In January 2019, the European Parliament called the European Commission to regularly analyze the VNRs. The Parliament also encouraged the Commission work with partners such as the Organization for Economic Cooperation and Development (OECD) to develop peer-review mechanisms “for successful SDG implementation strategies and action in domestic and external policies, and for better monitoring of negative external spill-over effects”. The European Parliament also stated that “Eurostat alone cannot comprehensively capture all dimensions of SDG progress, taking into account spill-over effects and the need for indicators which are not purely economic in nature” calling for the involvement of multiple stakeholders in the SDG monitoring process.¹²³

Corporate actions also need to be aligned with the SDGs. For companies involved in the soy supply chain, this means maximizing direct positive impacts - primarily to support SDG 2 (No Hunger) - while minimizing negative impacts on climate, forests and biodiversity (SDG 12-15) and striving to make positive contributions to other, more indirect socio-economic aspects of the SDGs - such as fight against unemployment and poverty, covered under SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth). Ultimately, it is the role of public authorities to regulate, monitor and take actions to enforce rules and regulations in terms of soy production but also standards for imports.¹²⁴

¹²² Sustainable Development Solutions Network. (2019). Exposing EU policy gaps to address the Sustainable Development Goals. Retrieved August 13, 2019, from <http://unsdsn.org/resources/publications/exposing-eu-policy-gaps-to-address-the-sustainable-development-goals/>.

¹²³ Sustainable Development Solutions Network. (2019).

¹²⁴ The Columbia Center for Sustainable Investment and the SDSN are developing a conceptual framework to define SDG-aligned business practices in the food sector.

The SDGs are a useful framework to guide the Corporate Sustainable Responsibility (CSR) reporting of companies involved in the soy supply chain. Yet, such corporate SDG reporting should include the following elements to be really comprehensive: (i) Transformative, time-bound & quantified targets covering also intermediate suppliers; (ii) Relevant indicators; (iii) Reports about potential negative impacts and mitigation processes; (iv) Connections between companies' efforts and national objectives and pathways.

The six major companies involved in the soy supply chain in Argentina and Brazil mention the SDGs and related terms in their annual CSR reports.

However, careful monitoring is needed to go beyond rhetoric and track transformative actions ([Table 4](#)). Some companies have mapped their corporate strategies and indicators to the SDGs (e.g. AMAGGI). Some claim that they have set targets through 2030 aligned with the global goals (e.g. Louis Dreyfus). However, the target on GHG emissions set by Louis Dreyfus is to reduce their global GHG emissions by one percent per year from 2018. While this may lead to marginal progress, more needs to be done to achieve the goals of the 2030 Agenda and the Paris Agreement. The one percent annual target decrease set by Louis Dreyfus is well below the efforts that need to undertake to achieve the goals of the Paris Agreement and carbon neutrality by 2050.

Table 4 SDGs in CSR reports of six major companies involved in the soy supply chain in Argentina and Brazil

Companies	Report	Are the SDGs mentioned?	Key SDG statements
ADM	2018 CSR: Our Sustainability Journey	Yes	"In alignment with the United Nation's Sustainable Development Goals, we are focusing our accelerating efforts on four key areas: Zero Hunger, Clean Water and Sanitation, Climate Action, and Life On Land."
Amaggi	2017 Sustainability Report	Yes	"AMAGGI also continued, in 2017, to integrate the Sustainable Development Goals into its main sustainability planning and management processes"
Bunge	2018 GRI Sustainability Report	Yes	"At Bunge, our vision is to build 21st Century Value Chains that are transparent, verified sustainable and create positive impacts on the ground in support of global UN Sustainable Development Goals (SDGs)."
Cargill	Cargill SDG Web Page	Yes	"Cargill supports the U.N.'s Sustainable Development Goals (SDGs). Working to nourish the world, protect the planet and enrich communities, we know business plays an important role in advancing the Global Goals, which aim to end poverty, address climate change and ensure prosperity for all."
COFCO	Sustainability Report 2018	Yes	"Our strategy reflects the United Nations (UN) 2030 Agenda for Sustainable Development. Its 17 Sustainable Development Goals span the most pressing economic, social and environmental challenges of our time. By aligning with these goals, we aim to measure and report our sustainability progress with the 'bigger picture' in mind."
Louis Dreyfus	Sustainability Report 2017	Yes	"With the long-term focus of the Sustainable Development Goals in mind, we are also working to set targets through 2030 or beyond, and will report on the conclusion of that process next year."

Organizations such as the World Benchmarking Alliance (WBA), the WBCSD and UN Global Compact support companies' efforts to align their production methods and impacts with the SDGs. A global survey conducted in 2018 by Price Waterhouse Coopers showed that 60 percent of companies surveyed mentioned the SDGs in their CSR report but ultimately only 23 percent of companies disclosed meaningful Key Performance Indicators and targets related to the SDGs. Beyond CSR reporting, we also need better assessments on how to report SDG impacts at project level. This is crucial to avoid SDG over claims and to connect national pathways and strategies with project level implementation. Gold Standard with the support of the SDSN, has recently published a set of general guidance for the identification of impacts and indicators for activity level SDG impact reporting. These apply primarily to "climate action" projects (renewable energy, energy efficiency, waste management, agriculture, forestry, water management, urban development) but can be extended to other types of projects. The guidance document provides a set of criteria to consider when reporting impacts, magnitude of impacts and mitigation strategies to address potential trade-offs and unintended negative impacts of climate related interventions on other SDGs. Moving forward key indicators will be identified and modules will be developed to allow project developers to track their impacts on each specific intervention (community services, renewable energy, waste management and handling, forestry and agriculture).¹²⁵

¹²⁵ Gold Standard. (2019). *Guidance for the identification of impacts and indicators for activity level SDG impact reporting: Version 1*. Retrieved from https://www.goldstandard.org/sites/default/files/2019_sdg_tool_guidance_briefing.pdf.

4. Policy instruments

There is wide range of policy instruments that have an impact (or could have an impact) on the sustainability of the soy sector. In the following section we present the most relevant and targeted initiatives as well as a number of policies that could -once adjusted- reduce negative impact of soy production. The analysis together with the stakeholder mapping has allowed us to shortlist relevant policy recommendations for EU stakeholders. This means that we have focused in our analysis on policies that have -or could have- significant impact and may be open for modification or scaling.

Our analysis starts with global initiatives described in section 4.1., followed by initiatives in the producer countries Brazil and Argentina (sections 4.2. and 4.3) followed by consumer jurisdictions EU and Chinese policies (sections 4.4. and 4.5). For consumer jurisdictions we focus on voluntary certification standards, reporting initiatives and financial instruments, as well as demand-side measures such as multi-stakeholder strategic dialogue or regulatory measures such as sustainability criteria in trade agreement or corporate due diligence. At the soy suppliers' national level, we look at public and private instruments such as zoning and land-use regulation and sectorial agreements, as well as green credit initiatives. [Table 5](#) summarizes the different types of instruments and impact on sustainability that are analyzed in this section.

Table 5 Summary of the policy instruments

Type of policy instrument/ initiative	Vol/ Man*	Stakeholder	Supply chain stage entry point	Mechanism	Sustainability impact	Examples/ Cases
Zoning and Land use planning	Man	Public	Production	Defines the allowable land use	Constrains the areas open for soy production	<ul style="list-style-type: none"> •Brazil's EEZ, CAR, PRA; •Argentina's OTBN
Jurisdictional approaches	Vol	Multi-stakeholder	Production	Combines public and private action at jurisdictional scale	Preserve and restore forests, support vulnerable communities, while enabling soy production	<ul style="list-style-type: none"> •Produce, Conserve, and Include (PCI)
Sectoral agreement	Vol	Public-private	Production	Forges a commodity commitment agreement among relevant supply chain actors	Has the potential to significantly reduce soy production impact in covered areas	<ul style="list-style-type: none"> •Amazon Soy Moratorium •Cerrado Working Group
Corporate commitments	Vol	Private	Production	Self-regulation and reporting of internal processes	More sustainable sourcing practices are implemented	<ul style="list-style-type: none"> •COFCO •Consumer Goods Forum •TFA
Trade agreements	Man	Public	Production, Trade	Defines export/import	Can reduce the demand for	<ul style="list-style-type: none"> •Mercosur •FLEGT

and import/export regulation				standards and formulates tariffs	unsustainable soy	<ul style="list-style-type: none"> •Mandatory due diligence •Reviewed Renewable Energy Directive
Certification /sustainability standards	Vol	Public Private	Production, Demand	Assures compliance of sustainable practices	Allows demand to distinguish sustainable soy supply	<ul style="list-style-type: none"> •RTRS •ProTerra Foundation •ASC
Sourcing guideline standards	Vol	Retailers, Countries	Procurement	Promotes de adoption of soy supply sustainable best practices	Reduces the supply of unsustainable soy	<ul style="list-style-type: none"> •EU's FEFAC •China's CRSSG •AFA •Private company (LDC, Vicentin Group)
Transparency / Reporting	Vol	Public/ Private	Entire chain	Track, assess and disclose information on deforestation, supply chains and corporate reporting for public entities, consumers and businesses.	Improves transparency on state of affairs of sustainability efforts	<ul style="list-style-type: none"> •UN Global Compact •EU's Observatory on Deforestation •France's National Deforestation Platform, •UK's Monitoring Framework •Germany's Project for Innovation in Tropical Forest Protection in the Amazon
Subsidies	Vol	Public	Production	Incentivize farmers to shift from maize to soybean production	Increases, for example, domestic production of soy in China; or can discourage unsustainable soy production in producer countries	<ul style="list-style-type: none"> •Soy subsidies in China •Production and export subsidies in Brazil and Argentina
Public credit system	Vol	Public	Production	Can link financial support to sustainable practices	Rewards farmers that comply with sustainable practices	<ul style="list-style-type: none"> •SNCR in Brazil
Targeted financial instruments	Vol	Private	Production	Can offer financial support for deforestation-free supply chain efforts	Rewards farmers that comply deforestation-free criteria	<ul style="list-style-type: none"> •SCC •Banking initiatives (Santander, Bunge, TNC) •Responsible Commodities Facility •Green Financial Market Regulation •Green Bonds
Public extension program	Vol	Public	Production	Training and support for producers to improve and comply with sustainable practices	Disseminates best sustainable practices and technologies among producers	<ul style="list-style-type: none"> •INTA •Development cooperation projects (Euroclima+, GIZ, KfW)
Private extension program	Vol	Private	Production	Training and support for suppliers to	Dissemination of best sustainable	<ul style="list-style-type: none"> •Soja Plus

				improve and comply with sustainable practices	practices among producers	
Strategic stakeholder engagement	Vol	Public Private	Production, Demand	Engages local and global stakeholders across value chains in sustainable soy sourcing	Reduces the supply of and demand for unsustainable soy supply	<ul style="list-style-type: none"> •SSTP •ADP •TFA •Sustainable Protein Feed Forum
Action plans/regulations	Vol/Man	Public	Consumption	Reviews potential policy options to remove deforestation from imports	Create demand for sustainably produced and sourced soy	<ul style="list-style-type: none"> •EU Communication on Forests

* Vol = Voluntary, Man = Mandatory

4.1 Global initiatives

Several voluntary initiatives exist at the international level that aim to improve the sustainability of soy supply chains. The UN Global Compact’s SDG reporting initiative aims to track companies’ commitments and impacts linked to the SDGs, including those related to land use and conversion (SDG 15). Global certification standards, such as ProTerra and RTRS, have potential, however, they suffer from limited global demand for certified soy. Initiatives, such as the Soft Commodities Compact, are mobilizing major banks involved in the soy sector to develop banking practices to gradually disinvest from commodities linked to deforestation.

4.1.1 SDG reporting: UN Global Compact

The United Nation Global Compact is a voluntary initiative aiming to encourage sustainability in the private sector. As of 2018, over 13 thousand business and non-business actors have become participants to the initiative. The Global Compact promotes the adoption of sustainable principles rooted in its Ten Principles, which cover aspects related to human rights, labor, environment and anti-corruption,¹²⁶ as well as the SDGs.¹²⁷ Most importantly, the UN Global Compact developed along with Global Reporting Initiative (GRI) a manual on how companies can mainstream the SDGs and report on their progress on an annual basis.¹²⁸

Being the largest corporate sustainability initiative in the world, the Global Compact is well-positioned to encourage and monitor action. In 2018, 80 percent of companies participating were reporting on the SDGs to the initiative. Over the years, annual reports show that companies have increasingly mainstreamed the Ten Principles, as well as the SDGs, in their company

¹²⁶ United Nations Global Compact. (2019). *UN Global Compact | The Ten Principles of the UN Global Compact*. Retrieved from <https://www.unglobalcompact.org/what-is-gc/mission/principles>.

¹²⁷ United Nations Global Compact. (2019, May). *UN Global Compact 2018 Annual Management Report*. Retrieved August 12, 2019, from <https://www.unglobalcompact.org/docs/publications/UNGC-2018-Annual-Mgmt-Report.pdf>.

¹²⁸ Bernhard Frey. (2019). *Reporting on the SDGs*. Retrieved from <https://bit.ly/2M2H9W8>.

operations. In relation to deforestation-free soy, the SDG reporting guideline provides recommendations to strengthen corporate SDG reporting by selecting SDGs based on the company's impact rather than feasibility and by promoting reporting on SDGs impact positively as well as negatively.¹²⁹ The promotion of best practices in corporate SDG reporting aim to strengthen the transparency and accountability of corporate reporting.

The six major companies responsible for 59.5 percent of soy exports from Brazil and Argentina in 2017 participate in the UN Global compact initiative.^{130,131}

The latest release of the annual Global Compact report, which assesses how businesses are adopting the Ten Principles, also included insight into SDG impacts and corporate commitments. Two-thirds of companies reported that the UN Global Compact has influenced their way to address environmental matters. The report finds that 78 percent of companies attested to having objectives relating to SDG 12 (Sustainable Consumption and Responsible Use).

However, the report also shows that, while half of companies have targets in relation to Goal 13 (Climate Action), 60 percent of companies do not measure their GHG impact. Moreover, only ten percent of businesses integrated biodiversity policies in their strategies and fewer than 30 percent of companies located in production countries set targets to achieve Goal 15 (Life on Land).¹³² The report also indicates that integrating sustainable practices throughout the supply chain is one of the main challenges faced by large-scale companies. So far, few companies are requiring supply chain partners to adhere to sustainability principles (7 percent in 2008, 14 percent in 2018).¹³³

The UN Global Compact also supports sustainability in supply chains, without, however, explicitly referring to soy, for example:

- Sustainable Supply Chains website¹³⁴. This website provides resources, case examples and initiatives for businesses seeking information on this topic.
- Advisory Group on Sustainable Chain Sustainability. This body provides input for the initiative's strategy, as well as functions as a network for communication between different stakeholders.
- Food and Agriculture Business Principles. UN Global Compact participants in the food and agriculture sector can also embrace these voluntary principles related to the sustainable use of land.

¹²⁹ UN Global Compact, & Global Reporting Initiative. (2018). *Business Reporting on the SDGs: Integrating the SDGs Corporate Reporting: A Practical Guideline*. Retrieved August 12, 2019, from https://www.globalreporting.org/resourcelibrary/GRI_UNGC_Reporting-on-SDGs_Practical_Guide.pdf.

¹³⁰ TRASE. (2017). Brazil-Soy. *Trase*. Retrieved March 15, 2019, from <https://trase.earth/data?>

¹³¹ ProTerra Foundation. (n.d.). The Standard. *Pro Terra Standard Version 4.0*. Retrieved August 13, 2019, from <https://www.proterrafoundation.org/the-standard/>.

¹³² United Nations Global Compact. (2018). *Progress Report*. Retrieved from <https://www.unglobalcompact.org/library/5637>.

¹³³ United Nations Global Compact. (2018).

¹³⁴ UN Global Compact. (2019). *Sustainable Supply Chains: Resources and Practices*. Retrieved from <http://supply-chain.unglobalcompact.org>.

4.1.2 Certification Standard: RTRS & Proterra Foundation

The Round Table on Responsible Soy (RTRS) is a civil society organization established in 2006 promoting sustainable soy supply chains. Its members include civil society actors and major soybean supply chain actors. The RTRS adopted a certification standard to attest that soybeans are produced complying with certain socio-economic and environmental practices and another one to establish the traceability along the soy supply chain.

An alternative – and slightly less demanding than RTRS – standard has been developed by the ProTerra Foundation. When assessed, its 2018 version performed slightly less well in terms of basic provisions for deforestation, biodiversity and wetlands conversion than the RTRS standard.¹³⁵ The ProTerra standard seeks to improve sustainability of the entire food supply chain, although it is mainly used in the soy supply chain.¹³⁶ It only applies to non-GMO crops and its 2019 4.0 version has not allowed land conversion since 2008. However, the RTRS also applies the same zero-deforestation criteria since 2016 and is sometimes considered a more transparent standard.¹³⁷

In 2014, both standards setters signed a memorandum of understanding (MoU) in order to align efforts, improve transparency, reduce audit costs for suppliers and provide trainings.¹³⁸ In 2019, a new version of the Proterra Foundation standard, that will be benchmark against SDGs has been released.¹³⁹ Together, RTRS and Proterra Foundation are the largest world soy certifications and although the volumes certified have risen in the past decade ([Figure 10](#)), in 2016 they accounted for 2.5 percent of the global soy production.¹⁴⁰

¹³⁵ Kusumaningtyas, R. (2019). *Setting the bar for deforestation-free soy in Europe*. Retrieved from <https://bit.ly/2GFDPdGV>.

¹³⁶ ProTerra Foundation. (2019a). The ProTerra Foundation: Non-GMO certification for soy, sugar & tree nuts. Retrieved from <https://www.proterrafoundation.org/>.

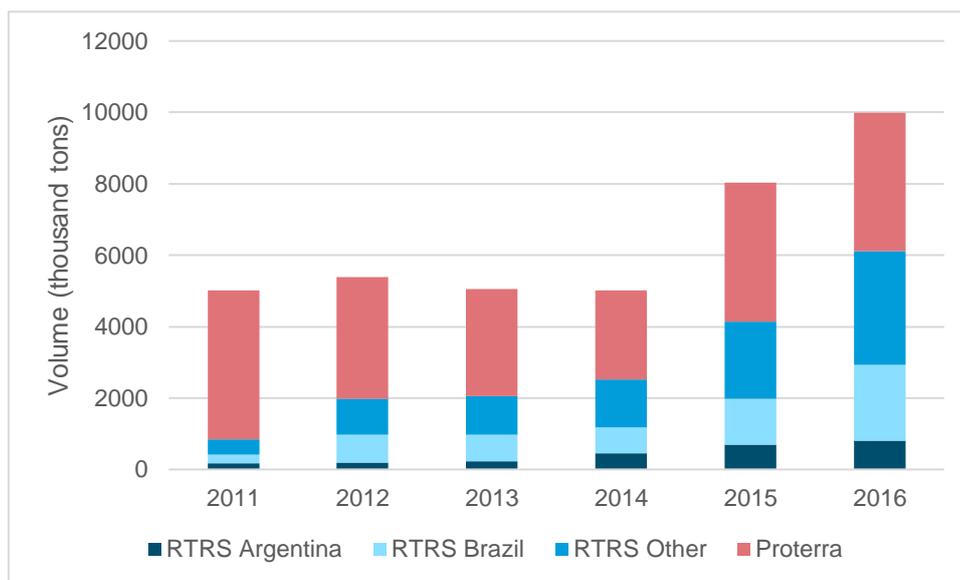
¹³⁷ Kusumaningtyas, R. (2019).

¹³⁸ Anwander, S., & Mascotena, A. (2014). RTRS and ProTerra in joint agreement to help drive volumes of sustainable, certified soy. Retrieved from <https://bit.ly/2YhO2cf>.

¹³⁹ ProTerra Foundation. (2019b). The Standard. *ProTerra Foundation*. Retrieved March 15, 2019, from <https://www.proterrafoundation.org/the-standard/>.

¹⁴⁰ International Trade Center et al. (2018).

Figure 10 Trend of RTRS and ProTerra certified volumes



Source: RTRS and Proterra Foundation^{141 142}

Both certifications have strengths and perform well in terms of ecosystem protection and level of assurance.¹⁴³ They cover overarching issues, such as protection of areas of high conservation value, smallholders’ land use rights, protection of workers, health and labor, pesticide use, as well as sustainable agricultural practices.¹⁴⁴ Moreover, they are both widely used by important soy supply chain actors. In 2018, production certified under RTRS increased year-on-year by 7.7 percent and reached a total volume of 4.3 million tons, of which 87.47 percent came from Brazil and 8.6 percent from Argentina. Nevertheless, a lack of demand for RTRS-certified soy means that less than 2/3 of RTRS credits were bought and therefore premium per ton are pressured downwards and over the past years represent less than 1 percent of the total price which are insufficient to cover the costs associated to meeting the certification requirements.¹⁴⁵

The annual figure of ProTerra-certified soy has stayed relatively constant in the past ten years due to the low amount of GMO-free soy production. In 2017, 3.8 million tons of soy have been certified by the ProTerra Standard.¹⁴⁶ An analysis of 17 voluntary soy standards (which did not include the ProTerra standard) found that RTRS was among the main three standards with the greatest number of provisions protecting forests, wetlands and biodiversity, while at the same time having a high level of assurance (i.e. third-party auditing).¹⁴⁷ Moreover

¹⁴¹ International Trade Center et al. (2018). Proterra-certified country-specific volumes for Argentina and Brazil were not available.

¹⁴² Round Table Responsible Soy. (n.d.). Certified Volumes and Producers - RTRS - Round Table Responsible Soy. Retrieved September 27, 2019, from <http://www.responsiblesoy.org/mercado/volumenes-y-productores-certificados/?lang=en>.

¹⁴³ Kusumaningtyas, R. (2019).

¹⁴⁴ Anwander, S., & Mascotena, A. (2014).

¹⁴⁵ ProTerra Foundation. (2019a).

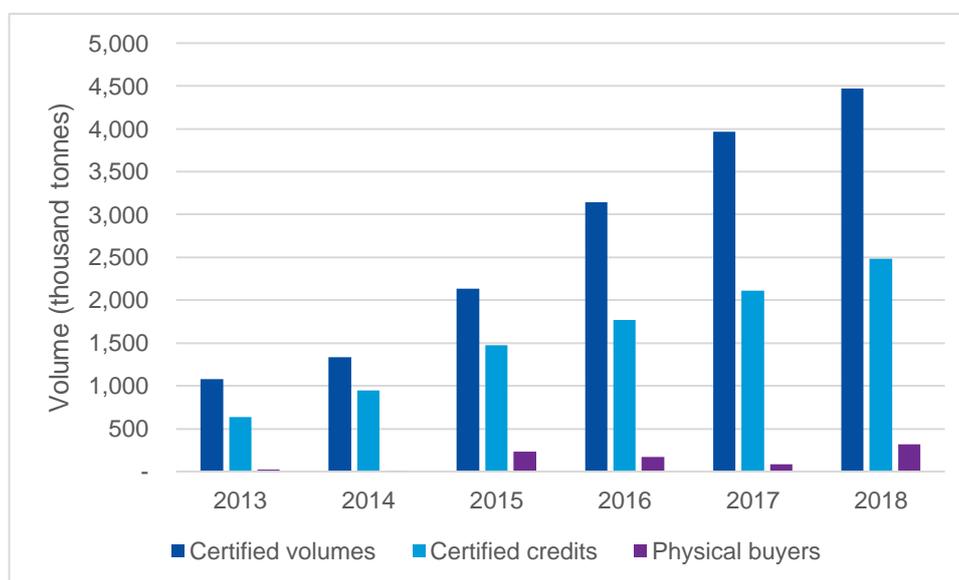
¹⁴⁶ International Trade Center, International Institute for Sustainable, & Research Institute of Organic. (2019). *The State of Sustainable Markets 2019: Statistics and Emerging Trends*. Retrieved from <http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/Sustainable%20markets%202019%20web.pdf>.

¹⁴⁷ Kusumaningtyas, R. (2019).;

the RTRS and the International Sustainability and Carbon Certification (ISCC), a US-based sustainable certification, is one of the few standards approved by the European Union that demonstrates compliance with EU-level sustainability criteria for biofuels.¹⁴⁸

The complexity of the soy supply chain poses technical barriers for the ProTerra and RTRS standards to monitor commitments. The ProTerra initiative, for instance, seeks to address this by developing tools (e.g. analysis of satellite pictures) in order to more easily track local farms and the movement of soy products along the supply chain. The standard conducts audits after two years of certification, which are necessary for renewing the certification. In case of reported misconduct (e.g. by civil society or the media), the foundation conducts audits and establishes corrective action plans that are monitored.

Figure 11 RTRS Certified Soy vs. Purchased Physically certified soy



Source: RTRS¹⁴⁹

The most significant barrier to these standards, however, is the lack of demand for certified soy (Figure 11). While certain countries' demand is increasing, such as in Germany and Austria, overall demand remains low.¹⁵⁰ In the case of RTRS, 1/3 of the RTRS credits did not find a buyer in 2016, as well as in 2017 and 2018.¹⁵¹

¹⁴⁸ Kusumaningtyas, R. (2019).

¹⁴⁹ International Trade Center et al. (2018). Volume of certified soy refers to soy that is certified in Brazil and Argentina, while purchased soy is volume of certified soy purchased globally. No data was available for RTRS certified soy volumes that is purchased only from Argentina and/or Brazil.

¹⁵⁰ Kusumaningtyas, R. (2019).

¹⁵¹ ProTerra Foundation. (2019b).

4.1.3 Targeted Financial Instrument: Soft Commodities Compact

The Soft Commodities Compact (SCC) aims to achieve net zero deforestation in soy, palm oil, beef as well as paper, pulp and timber.¹⁵² The SCC - a company-led initiative launched by the Consumer Goods Forum and the Banking Environment Initiative in 2014- aims to support the achievement of SDG 15 by 2020 by developing banking practices that support sustainable commodities production. Moreover, SCCs also aims to raise sustainability standards used by the banking industry to identify clients.

A dozen major global financial institutions companies have become members to the SCC so far. Ten of those have adopted specific soy policies.¹⁵³ This means that approximately 50 percent of global trade finance is now following the SCC sustainability goal.¹⁵⁴ In order to implement the initiative, SCC banks are advised to

- Develop and communicate the bank's policies and strategies to reach net zero emissions. This includes minimum requirements that lending companies must follow, measures in case of non-compliance, reporting procedures and the bank's interpretation of key terms (e.g. deforestation).
- Verify whether potential clients are committed to SCC's goals. This can be accomplished by, for instance, requesting a time-bound plan and a third-party certification (e.g. RSPO).
- Monitor that the bank's customer's production or processing operations comply with the goals set out by the SSC.^{155,156}

While these steps can lead to positive change, SCC recognizes a number of challenges. First, more effort is needed to connect global banks with local level producers, buyers and financiers in producer countries. Second, issues such as land rights, poverty of rural populations and the lack of demand globally for sustainable products needs to be taken into account. Third, the SCC does not account for the hundreds or thousands of stakeholders that are often involved in a supply chain. The assistance to one actor in a supply chain needs to be carefully monitored so that it truly matches zero-net deforestation goals. This consequently also leads to a fourth limitation, namely that the initiative faces difficulties in establishing cause and effect as well as in monitoring progress.

There is also the challenge of involving more, including local, financial institutions to avoid leakage and a shifting of credit to other organizations. In 2018, looking at 98 most influential financial institutions in the forest risk commodity supply chains, less than 30 percent of the loans they granted in the soy sector were undertaken by institutions that have a sustainable lending policy. In addition,

¹⁵² Banking Environment Initiative and Cambridge Institute for Sustainability Leadership. (2015). The BEI & CGF's "Soft Commodities" Compact: Technical Guidance. Retrieved from <https://bit.ly/333HxYZ>.

¹⁵³ The 12 global financial institutions are Barclays, BNP Paribas, Deutsche Bank, Lloyds Banking Group, Royal Bank of Scotland, Santander, Standard Chartered, Espac, JP Morgan, Rabobank, Societe Generale, UBS, and from which Barclays and Lloyds have not adopted a specific soy policy.

¹⁵⁴ Banking Environment Initiative and Cambridge Institute for Sustainability Leadership. (2015).

¹⁵⁵ Banking Environment Initiative and Cambridge Institute for Sustainability Leadership. (2015).

¹⁵⁶ Banking Environment Initiative and Cambridge Institute for Sustainability Leadership. (2015).

only 1/3 of those loans was granted to another Forest 500 company with a sustainable policy.¹⁵⁷

4.2 Brazil

The sustainability of soy and the commodity's impact as driver of deforestation is a recognized concern in Brazil. The Brazilian legal framework protects forests and aims to improve transparency and enforcement through mechanisms such as the Rural Environmental Registry (CAR, acronym in Portuguese) and the Environmental Compliance Program. However, the enforcement of fines and detection of illegalities remains weak. Private initiatives, such as Soja Plus and the green agricultural credit, have potential to contribute to supporting the adoption of sustainable best practices in the soy supply chain, yet data suggest their impact has been limited so far. Meanwhile, the Soy Moratorium and the Cerrado Working Group have been identified as a factor in decreasing soy-related deforestation rates in the Amazon region and as the major opportunity to reduce land conversion in the Cerrado region. In [Table 6](#), major policy instruments and initiatives in Brazil are summarized.

Table 6 Summary of policy instruments in Brazil

Policy Instrument /Initiative	Aim	Type	Year	Scope	Potential/ Limitations
Amazon Soy Moratorium	Halt production, trade and financing of soy from areas deforested after July 2006 in the Amazon.	Sectoral agreement	2006	Amazonas region	Effective at jurisdictional level but dependent on public law enforcement and can create deforestation leakages.
Cerrado Working Group	Reduce legal and halt illegal deforestation and forest conversion driven by soy in the Cerrado biome.	Sectoral agreement	2017	Cerrado region	Financial mechanism to incentivize/reward the reduction of legal deforestation driven by soy under development.
Ecological-Economic Zoning (EEZ)	Integrate environmental and socio-economic considerations into land-use planning.	Zoning and land use planning	2002	National	Strengthens the legal framework to stop deforestation. The implementation depends on public institutions willingness and capacity to enforce law.
Rural Environmental Registry (CAR in Portuguese)	Establish a public record system of rural properties and their land use.	Zoning and land use planning	2012	National	Registry established but the capacities to verify and enforce the land-use is being considerably weakened.
Environmental Compliance Program (PRA in Portuguese)	Establish land-use plans at rural property level to ensure compliance with land-use conservation requirements.	Zoning and land use planning	2012	National	Requisite for changes in the land-use (e.g. legal clearance, forest restoration). Weak enforcement as it is dependent on EEZ and CAR.
National Rural Credit System	Provides credits at preferential rates	Public credit system	1965	National	Specific credit programs for sustainable production

¹⁵⁷ Tom Bregman. (2019, April). Banks need to raise their game in battle against deforestation. *Forest 500*. Retrieved from <https://forest500.org/analysis/insights/banks-need-raise-their-game-battle-against-deforestation>.

(SNCR in Portuguese)	for soy production under specified conditions.				established but underfunded. High potential if CAR and PRA reinstated as conditions for all SNCR credits.
Mato Grosso state's Produce, Conserve, Include (PCI) strategy	Establish a multi-stakeholder collaboration to promote the production of agricultural commodities while preserving and restoring forest areas.	Jurisdictional approaches	2015	Mato Grosso region	PCI strategy established and several initiatives are being under design. Enabler for sustainable soy supply chain pathways conditional on favorable market and political environment.
Soja Plus	Promotes the adoption of soy production sustainable best practices and the compliance with legal framework.	Private extension program	2011	Mato Grosso region	Current impact limited but close link to APROSOJA provides access to influence the behavior of major soy producers in Brazil.
Santander, Bunge and TNC Fund	Provide financial support to farmers willing to go beyond legal deforestation requirements in the Cerrado.	Targeted financial instrument	2018	Cerrado region	Initial USD 50 million fund established. Low uptake by farmers fearing high overheads and opportunity costs of actions beyond legal requirements.
Responsible Commodities Facility	Provide financial support to 600 soy farmers in the Cerrado to expand into degraded pastures and restore 1.2 million ha.	Targeted financial instruments	2018	Cerrado region	Just launched their first USD 300 million green bonds for the 2020 planting season.

4.2.1 Public policies

4.2.1.1. Zoning and land use planning

Zoning and land use laws determine how land can be used and where commodities can be produced. The Ecological-Economic Zoning (EEZ) regulation, introduced in 2002, ensures that environmental and socio-economic considerations are integrated into land use planning in Brazil. The Forest Code (Federal Law No. 12,651/2012)¹⁵⁸ established a five-year period for all states to develop and approve their EEZ. Some implementation progress has been made at sub-state level and for some macro-regions. However, only one macro EEZ for the legal Amazon has been validated so far, and there is no state that has fully implemented the EEZ.¹⁵⁹

The Rural Environmental Registry (CAR) and the Environmental Compliance Program (PRA) are instruments established by the Forest Code. The CAR is a public electronic system of georeferenced information on rural properties (that have

¹⁵⁸ *Código Florestal (Forest Code) (2012)*. , Pub. L. No. LEI No 12.651 (2012). Retrieved August 15, 2019, from <https://www2.camara.leg.br/legin/fed/lei/2012/lei-12651-25-maio-2012-613076-norma-pl.html>.

¹⁵⁹ Ministry of Environment of Brazil. (2018). *Situação do ZEE no Brasil*. Retrieved August 15, 2019, from https://www.mma.gov.br/images/arquivo/80253/Estados/Informacoes_ZEE_2018_novo.pdf.

agricultural, forestry, fishery or related purposes), including information on property boundaries and the demarcation of Legal Reserves and Permanent Protection Areas. Farmers are under the obligation to register this information in the CAR, which is consequently verified by state environmental agencies. Moreover, farmers looking to obtain a loan from a financial institution need to be registered in the CAR system. This can be a significant incentive to register, similar to other public financial mechanisms that offer subsidized loans to farmers registered in the CAR system (section 4.2.2.3).¹⁶⁰

The Forest Code also requires all private rural landowners to conserve part of their property, which cannot be deforested. Legal Reserves are protected areas of native vegetation, while Permanent Protection Areas under the PRA also protect native vegetation particularly important for ecosystem services (e.g. water provision and soil quality). The proportion of land that needs to be reserved as PRA varies according to the biome. In the Amazon biome, 80 percent of the property must be conserved, moreover, 35 percent must be conserved in the transition Zone between Amazon and Cerrado and 20 percent in the Cerrado biome.¹⁶¹

Farmers who do not comply with the conservation requirements of their Legal Reserve or Permanent Preservation must sign up to the Environmental Compliance Program. Through this system, farmers outline a plan to either restore forests or provide monetary compensation if the forest conversion was conducted prior to 2008. In the case of farmers that comply with the conservation requirements it also allows the legal clearance of native vegetation, in particular in the Cerrado region where only 20 percent of properties must be conserved.¹⁶²

Nonetheless, the enforcement of these mechanisms has been limited so far. This is largely due to the fact that the registration to the CAR system was only due to be completed by the end of 2018 and continues to be incomplete. The registration to the CAR system requires an unverified self-declaration, which is sufficient to obtain the authorization to clear forest.¹⁶³ Moreover, the limited capacity and resources by state environmental agencies is also detrimental to the enforcement of the law.

It is worth noting that the German development cooperation through GIZ and KfW supports CAR registration since 2013. The project which is implemented in cooperation with the World Bank focusses on environmental registration and supply chain transparency with a focus on the Cerrado region.

4.2.1.2. *Green agricultural credit*

Brazil has adopted a range of transversal rural policies, but the major financial policy instrument used by producers is the National Rural Credit System (SNCR in Portuguese). The SNCR provides credits to farmers at preferential rates through 13 different programs. Each program has several credit lines with each a set of conditions to access to their funds. Some programs have a

¹⁶⁰ Van Dam, Jinke, Van Den Homberg, Heleen, & Hilders, Marianne. (2019). *An analysis of existing laws on forest protection in the main soy producing countries in Latin America.*

¹⁶¹ Van Dam, Jinke et al. (2019).

¹⁶² Van Dam, Jinke et al. (2019).

¹⁶³ Carvalho, W., Mustin, K., Hilario, R., Vasconcelos, I., Eilers, V., & Fearnside, P. (2019). Deforestation control in the Brazilian Amazon: An observation struggle being lost as agreements and regulations are subverted and by passed. *Perspectives in Ecology and Conservation.*

specific green focus such as the National Biodiesel Production and Use Program and the Social Seal, launched in 2005, and the Low Carbon Agriculture Plan (ABC Plan) launched in 2010. The ABC Plan had a budget of USD 261 million in 2016 which represented less than 1 percent of the total volumes of agricultural credits provided by the SNCR.¹⁶⁴

While the programs with environmentally friendly requirements represent a small share of the total amount of rural credits there is a raising trend. The total volume of agricultural credits provided by the SNCR has increased remarkably, expanding from USD 5.45 billion (BRL 17 billion) in 2002 to USD 17.6 billion (BRL 194 billion) in 2015.¹⁶⁵ Before 2015, some of the programs offered credits conditional on the registry to the CAR system.¹⁶⁶

4.2.2 Private initiatives

4.2.2.1. *Training/extension programme: Soja Plus*

Soja Plus, launched by Aprosoja and Abiove, is a training scheme that supports soy farmers to comply with social and environmental legislation and to improve agricultural practices. It provides farmers with training and technical assistance, with a key focus on compliance with the CAR and the PRA requirements mentioned in section 4.2.2.1.

In 2017, Abiove and Aprosoja signed a Memorandum of Understanding (MoU) with European partners that would benchmark Soja Plus against European Feed Manufacturers' Federation (FEFAC)'s sourcing guidelines (section 4.5.3.1). The MoU which was signed with (FEFAC, the European Vegetable Oil and Protein meal Industry (FEDIOL) and the Sustainable Trade Initiative (IDH) to strengthen cooperation on responsible soy production. It also took Soja Plus from Mato Grosso to more Brazilian states. Moreover, the MoU also aims to explore the development of verified sourcing areas with initial pilots in the state of Mato Grosso.¹⁶⁷ Abiove and Aprosoja have also signed a MoU with the China Soybean Association to support collaboration on responsible production; however, more information on the MoU is not currently available.¹⁶⁸

There is limited information on the impact of the Soja Plus program on improving the compliance of farmers with the CAR and PRA requirements. Nevertheless, the close relation with ABIOVE and Aprosoja, the most important organization for soy farmers in Brazil, offers a unique entry point for collaboration with other sustainability initiatives.

¹⁶⁴ Assuncao, J., Souza, P., & Figueiredo, B. (2018). *Distribution Channels for Rural Credit: Design of Financial Services Increase Farmers Uncertainty* (Policy Brief) [Policy Brief]. Retrieved from <https://climatepolicyinitiative.org/publication/distribution-channels-rural-credit/>.

¹⁶⁵ Lopes, D., & Lowery, S. (2015). *Rural Credit in Brazil: Challenges and opportunities for promoting sustainable agriculture*. Retrieved August 13, 2019, from https://www.forest-trends.org/wp-content/uploads/imported/ft-mapping-rural-credit-in-brazil_v19_final-rev-pdf.pdf.

¹⁶⁶ Assuncao, J. et al. (2018).

¹⁶⁷ Aprosoja, Abiove, Fefac, Fediol, & IDH. (2017). *MEMORANDUM OF UNDERSTANDING Between Aprosoja, ABIOVE, FEFAC, FEDIOL & IDH*. Retrieved from <https://www.fefac.eu/file.pdf?FileID=74149&CacheMode=Fresh>.

¹⁶⁸ Solidaridad, Twitter, LinkedIn, & YouTube. (2016, April 22). Solidifying China and Brazil's strategic soy trade partnership. *Solidaridad Network*. Retrieved August 13, 2019, from <https://www.solidaridadnetwork.org/news/solidifying-china-and-brazil%E2%80%99s-strategic-soy-trade-partnership>.

4.2.2.2. *Corporate commitments*

In Brazil, from the 74 most influential companies operating in some form in the country's soy supply chain, only 21 (28 percent) have commitments to protecting forests. This is slightly higher than the global average, but remains low. Fourteen of those companies have headquarters in Brazil but only five of them have a commitment to protecting forests in their production or sourcing of soy.¹⁶⁹

The implementation of commitments is not reported consistently across companies. While eleven out of the 21 companies operating in Brazil and with a commitment to protect forest, report some type of progress, only three companies have reported clear indicators, such as the total volume of soy bought and the share that complies with the company's commitments. Moreover, eleven of these 21 companies were also found to only meet one or none of the indicators looking at implementation. This type of progress/implementation reporting is key in assessing whether and how companies are meeting their voluntary pledges.¹⁷⁰

4.2.2.3. *Investments and financial support*

Recently a number of initiatives use access to finance as tool to incentivize farmers not to convert native vegetation have emerged in the Cerrado region. Those initiatives aim to meet farmers financial needs by offering long-term loans with low interest rates under the condition that specific sustainability conditions are met. One of these initiatives is the financing mechanism, with an initial fund of USD 50 million, established by Santander, Bunge and TNC to offer long term loans to soy farmers in Cerrado on condition that farmers go beyond the legal requirements and do not convert native vegetation.¹⁷¹ Another of these initiatives is the Responsible Commodities Facility which aims to provide loans for soy farmers in the Cerrado to expand onto degraded pasture and is aiming to establish an initial USD 300 million credit line.¹⁷² In addition, over the period of 10 years, the Responsible Commodities Facility aims to generate cumulative loans of USD 3 billion to 600 soy farms.¹⁷³ The Germany development cooperation evaluates options for financing deforestation-free supply chains in the context of green bonds and 'green finance regulation'.

However, there are key challenges for both initiatives, including a low uptake by farmers which fear higher overheads and higher opportunity costs associated with action beyond legal requirements.¹⁷⁴ In addition, there are other challenges to ensure and finance technical assistance for farmers and monitor the compliance of sustainability conditions.

¹⁶⁹ Forest 500. (2019). Forest 500 Annual Report 2018: the Countdown to 2020. Retrieved August 13, 2019, from <https://forest500.org/forest-500-annual-report-2018-countdown-2020>.

¹⁷⁰ Forest 500. (2019).

¹⁷¹ The Nature Conservancy, D. (2018, August 29). Bunge, Santander Brasil and TNC to Offer Soy Farmers Long-Term Loans to Expand Production without Clearing Native Habitat in the Brazilian Cerrado. *The Nature Conservancy*. Retrieved July 31, 2019, from <https://www.nature.org/en-us/explore/newsroom/bunge--santander-brasil-and-tnc-to-offer-soy-farmers-long-term-/>.

¹⁷² Brasil Lab. (2018). *Responsible Commodities Facility (RCF): Lab Instrument Analysis*. Retrieved August 13, 2019, from https://www.climatefinancelab.org/wp-content/uploads/2018/02/Responsible-Commodities-Facility_Instrument-Analysis.pdf.

¹⁷³ Brasil Lab. (2018).

¹⁷⁴ Brasil Lab. (2018).

4.2.3 Public/private initiatives

4.2.3.1. *Soy Moratorium (SoyM) for the Amazon*

Following pressure from NGOs and retailers, the ANEC and ABIOVE associations and their companies signed an agreement in 2006, known as the Amazon Soy Moratorium. With signing the Moratorium companies committed, to stop the production, trade and financing of soy from deforested areas. Initially designed for a duration of two years, the Moratorium has been renewed annually. Today, the Soy Moratorium is implemented by the Soy Working Group, composed of Abiove and ANEC members, the Ministry of the Environment, and civil society organizations (Conservation International, Greenpeace, IPAM, IMAFLORA, TNC and WWF-Brazil). Moreover, INPE is responsible for monitoring the agreement.¹⁷⁵

The Soy Moratorium is monitored by satellite images as well as field observation. The monitoring and the enforcement of laws by public authorities as well as the collaboration of soy actors in the region has provided good results.¹⁷⁶ Data suggests that the moratorium, along with other governance measures including the CAR, has led to a significant decline in soy-driven deforestation in the Amazon biome, which dropped from 30 percent in 2006 to less than one percent in 2014.¹⁷⁷ Given its effectiveness, the moratorium was indefinitely extended in 2016. However, as indicated in section 4.3.2. there are recent developments on the deforestation rates in the Amazon and the INPE future role in monitoring deforestation that need to be considered.

4.2.3.2 *Sectoral agreement: Cerrado Working Group*

Deforestation linked to soy production in the Cerrado region increased significantly since 2006.¹⁷⁸ In 2017, over 60 Brazilian NGOs, including WWF-Brazil, TNC, CI-Brazil, Greenpeace Brazil, IPAM (Amazon Environmental Research Institute) and Imaflora (Institute of Agricultural and Forest Management and Certification), released the Cerrado Manifesto, a call for “immediate action in defense of the Cerrado by companies that purchase soy and meat from within the biome, as well as by investors active in these sectors.”¹⁷⁹

The manifesto led to the establishment of the Cerrado Working Group (GTC) bringing together industry, civil society, government and financial institutions. The GTC seeks to eliminate deforestation and forest conversion in the Cerrado biome. While the GTC has not yet lived up to its potential, recent analyses suggest that the GTC has had limited impact on declining illegal deforestation rates. Moreover, a study conducted in 2019 that analyzed 77 percent of the Cerrado biome that is eligible for commercial land use, found that soy expansion accounted for 22 percent of conversion between 2003 and 2014 and that 15 percent of clearing exceeded restrictions on private properties under the

¹⁷⁵ Gibbs, H. K., Rausch, L., Munger, J., Schelly, I., Morton, D. C., Noojipady, P., et al. (2015a). Brazil's Soy Moratorium. *Science*, 347(6220), 377–378.

¹⁷⁶ Gibbs, H. K. et al. (2015a).

¹⁷⁷ Gibbs, H. K., Rausch, L., Munger, J., Schelly, I., Morton, D. C., Noojipady, P., et al. (2015b). Brazil's Soy Moratorium. *Science*, 347(6220), 377–378.

¹⁷⁸ Cleary, D. (2018, November 26). Saving the Cerrado. *The Nature Conservancy*. Retrieved July 31, 2019, from <https://www.nature.org/en-us/what-we-do/our-insights/perspectives/saving-the-cerrado/>.

¹⁷⁹ FAIRR. (2019). About - Cerrado Manifesto. *About - Cerrado Manifesto*. Retrieved March 15, 2019, from <https://cerradostatement.fairr.org/cerrado-manifesto/about/>.

Forest Code.¹⁸⁰ It also found that 51 percent of soy farms violated the Forest Code in one form or another, five times more than other farms in the region.¹⁸¹

The main challenge faced by the GTC is to persuade producers to refrain from legal conversion of native vegetation, and to possibly (if necessary) find a mechanism to compensate for opportunity costs associated with the avoided legal conversion. Ongoing discussions between GTC members are being held on a financial mechanism to compensate farmers for not converting land that could legally be deforested. While it is unclear how this mechanism would function and particularly who would pay for it, Cargill has pledged an initial USD 30 million to a fund to support the development of other ways to halt deforestation in the Cerrado region.¹⁸²

4.2.3.3. *Jurisdictional approaches*

Produce, Conserve and Include (PCI) strategy is a jurisdictional approach in Mato Grosso. Under the PCI both public and private actors that have committed aim to produce more agricultural commodities, conserve natural resources and include smallholders and indigenous people in economic development. If these goals are met, it will avoid an estimated 6.6 gigatons of greenhouse gas emissions by 2030.¹⁸³ It will do this through preserving 970,000 hectares of Amazon Rainforest and restoring 182,904 hectares of degraded pastureland. Although the PCI was launched in 2015, it is only in May 2018 that a PCI compact was signed, making it too early to judge its effectiveness.¹⁸⁴ The strengths of the PCI lie in its multi-stakeholder collaborative approach in which the private sector, local governments and NGOs work in concert to drive sustainability in the region. It also uniquely facilitates private sector engagement by providing a 'menu' of projects underway and suggesting methods of engagement (financial contributions, technical support or sourcing commitments).

4.3 Argentina

Compared to Brazil, there are fewer sustainability initiatives targeting Argentinian's soy sector. [Table 7](#) summarizes these instruments. Existing efforts are centered on sustainable guidelines and standards developed by the private sector. Zoning and land use planning has potential to limit forest conversion, but implementation is a challenge. So far, public attention has focused on issues related to the local environmental impacts of soybean agricultural practices (e.g. health hazards due to pesticide use). However, there are now increasing efforts to

¹⁸⁰ Gibbs Lab. (n.d.). Conversion-free soy agreements: Potential impacts on farms in the Cerrado. Retrieved August 13, 2019, from http://www.gibbs-lab.com/wp-content/uploads/2018/11/Infographic_Estimating_Cerrado_Farmer_Opportunity_Costs_August2018.pdf.

¹⁸¹ Rausch, L, Gibbs, H. K., Schelly, I., et al. (2019). Soy expansion in Brazil's Cerrado. *Conversation Letters*. Retrieved September 24, 2019, from https://www.researchgate.net/publication/335433977_Soy_expansion_in_Brazil's_Cerrado.

¹⁸² Sarah Sax. (2019, July). Cargill rejects Cerrado soy moratorium, pledges \$30 million search for ideas. *Mongabay Series: Amazon Conservation, Cerrado*. Retrieved from <https://news.mongabay.com/2019/07/cargill-rejects-cerrado-soy-moratorium-pledges-30-million-search-for-ideas/>.

¹⁸³ Produce, Conserve, Include (PCI). (n.d.). *EDF+Business*. Retrieved July 30, 2019, from <http://business.edf.org/pci>.

¹⁸⁴ Brazil: "Groundbreaking" Produce, Conserve, Include compact to restore up to 182,000 ha of degraded pastureland and protect 970,000 ha of Amazon Rainforest. (n.d.). *IDH - the sustainable trade initiative*. Retrieved July 30, 2019, from <https://www.idhsustainabletrade.com/news/brazil-juruena-valley-pci-compact-signed/>.

raise public awareness on the soybean supply chain's link with deforestation, in particular in the Chaco region.¹⁸⁵

Table 7 Summary of policy instruments in Argentina

Policy Instrument /Initiative	Aim	Type	Year	Scope	Potential/ Limitations
Native Forest Territorial Ordinance Law (OTBN in Spanish)	Establish authorized land-use, including forest areas and clearance.	Zoning and land use planning	2007	National	Only half of provinces have adopted their OTBN. Enforcement of OTBN depends on the willingness and capacity of public authorities.
National Agricultural Technology Institute (INTA in Spanish)	Develop and diffuse technologies, knowledge, and learning procedures for the agriculture, forestry, and agroindustries.	Public extension services	1956	National	INTA's network very well established but soy environmental and socio-economic issues are not part of INTA's main focus.
Soy Sustainability Policy (by Louis Dreyfus Company & Vicentin Group)	Establish the provisions and procedures to ensure the sourcing of sustainable soy along it's supply chain.	Sourcing guideline standards	2018	National	Strong (e.g. FEFAC compliant) sustainable soy certifications developed but implementation requires public disclosure and civil society monitoring.
Argentine Federated Farmers (AFA)	Comply with requirements to export biodiesel to the U.S. market.	Sourcing guideline standards	2015	International	The adoption of the RFS-2 EPA schemes by AFA members offers them access to the U.S. biodiesel market.
Certified Sustainable Agriculture (ASC in Spanish)	Develop a sustainable soy certificate for farmers adopting agricultural conservation practices.	Sourcing guideline standards	2008	National	The farmer uptake is very slow and limited but in 2018, it the area certified reached 100 000 hectares.

4.3.1 Public policies

4.3.1.1. Zoning and land use planning

Zoning and land use laws regulate agricultural production zones. According to Argentina's 2007 Native Forest Territorial Ordinance Law (OTBN in Spanish) each province must categorize its forest area --through a participatory process -- according to their possible uses into three categories:

- Red: forests with a high conservation value that should be maintained as forests
- Yellow: forests with a high and medium conservation value that cannot be cut down but can be used for sustainable use, tourism and research

¹⁸⁵ Chaco emite decreto que deroga permisos de desmonte sobre bosques nativos. (n.d.). *Greenpeace Argentina*. Retrieved August 13, 2019, from <https://www.greenpeace.org/argentina/issues/bosques/1056/chaco-emite-decreto-que-deroga-permisos-de-desmonte-sobre-bosques-nativos>.

- Green: forests with a low conservation value that can be converted (for land use purposes)¹⁸⁶

So far, less than half of the 24 provinces have adopted the OTBN categorization.¹⁸⁷ **In the absence of the OTBN categorization, deforestation cannot be authorized.** Once approved, converting 'green' forests into plantations (e.g. for soy) requires the approval of Land Use Change Plans (PCUS in Spanish). This plan must justify the land conversion, as well as lay out planned activities, such as agriculture, livestock, forestry and infrastructure. The approval of PCUS is also subject to an environmental impact assessment.¹⁸⁸ These regulations can contribute to soy supply chain sustainability if they are implemented correctly, as they demarcate conservation zones (red and yellow) that prohibit the cultivation of commodities and thus also land conversion.

While the OTBN is binding on the Argentine provinces, its application depends on the interest and capacity of each province. The implementation of the OTBN is thus supported by various funding mechanisms, notably the Program for the Management and Conservation of Native Forests (PMCNF). The PMCNF provided around USD 100 million to compensate farmers having put in place on a voluntary basis over 4000 conservation and management plans between 2010 and 2016. In total, the area under management and conservation plans only account for 10 percent of the 53 million hectares under OTBN.¹⁸⁹ In the case of the Chaco region, only 5.3 million hectares (of over 27 million hectares) have been categorized as green.

Some data suggests the law to be effective; less than 16 percent of forest clearance occurred in areas with no OTBN, while most clearance occurred in areas categorized as yellow forests (44 percent) and green forests (43 percent).¹⁹⁰ However, data also suggests the law to be implemented inconsistently throughout the country with only 8.5 percent of forests currently being categorized as 'red forests'. It is also unclear to what extent the OTBN can directly be linked to the declining deforestation rates in certain regions of the country. A major barrier to the implementation of the OTBN is the limited budget usually allocated to it. The budget allocated for 2019 was of around USD 16 million; this amount represents less than 5 percent stipulated in the law.¹⁹¹

4.3.1.2. *Extension services*

The National Agricultural Technology Institute (INTA in Spanish) is the federal agency responsible for agricultural research and extension services. More specifically, INTA is in charge of the generation, adaptation and diffusion of (i) technologies, (ii) knowledge and (iii) learning procedures for the agriculture, forestry and agroindustry sectors. It is composed by a network of 15 regional offices, six main research centres, 22 subsidiary research centers and has seen its

¹⁸⁶ Vida Silvestre. (n.d.). Ley de Bosques | Fundación Vida Silvestre Argentina. Retrieved August 13, 2019, from https://www.vidasilvestre.org.ar/nuestro_trabajo/que_hacemos/nuestra_solucion/cuidar_nuestro_mundo_natural/ordenamiento_territorial/ley_bosques/.

¹⁸⁷ Vida Silvestre. (n.d.).

¹⁸⁸ Dirección de Recursos Forestales. (2013). *Elaboración de planes en bosques nativos: Cartilla explicativa destinada a profesionales que elaboran y avalan planes año 2013*. Retrieved August 13, 2019, from http://recursosforestales.corrientes.gob.ar/assets/articulo_adjuntos/555/original/Cartilla_para_Profesionales_que_Formulan_Planes_en_Bosques_Nativos.pdf?1401202097.

¹⁸⁹ Van Dam, Jinke et al. (2019).

¹⁹⁰ Van Dam, Jinke et al. (2019).

¹⁹¹ Van Dam, Jinke et al. (2019).

budget rise up to a bit more than USD 150 million.^{192,193} Producers are the main beneficiaries of the research conducted by INTA. Although its main focus is related to supporting crop production, it also conducts research and provides advice to farmers on land-use practices and native forest management.

Notably, INTA is benefiting from an EU funded project, which among others, support the strengthening of capacities for forest management and restauration, including for territorial land use planification and deforestation monitoring.¹⁹⁴ Nonetheless, environmental and economic problems of the sector have received little attention. The public debate on the productive scheme anchored in soy monoculture, and its social, economic and environmental implications, for instance, have not been addressed by INTA yet.¹⁹⁵

4.3.2 Private initiatives

4.3.2.1. Corporate commitments

Thirty six percent (i.e. 18 out of 50) of companies in soy supply chains operating in Argentina have committed to protecting forests. While this number is significantly higher than the global average, a closer look indicates that seven out of the 18 commitments only relate to protecting the Brazilian Amazon, and thus do not grant protection to Argentine forests. Furthermore, a gap exists between commitments and their implementation. Eight out of the 18 companies assessed scored none or only one of the implementation indicators.¹⁹⁶

The implementation of commitments is also not reported consistently across companies. While ten out of the 18 companies operating in Argentina report some type of progress, only three companies have reported clear indicators, such as the total volume of soy bought and the share that complies with the company's commitments. This type of progress/implementation reporting is key in assessing whether and how companies are meeting their voluntary pledges.

In addition to these figures, Forest 500 also found that seven companies headquartered in Argentina are part of the most influential companies in soy supply chains globally. Five are large producers, processors and traders, while two are manufacturers (of biofuel and packaged food). However, only one company has a commitment to protecting forests in sourcing soy.

¹⁹² INTA. (n.d.). Instituto Nacional de Tecnología Agropecuaria. Retrieved August 13, 2019, from <https://inta.gob.ar/sites/default/files/intapresentacionespanol.pdf>.

¹⁹³ Gabriel Parellada, & Ezequiel Rivarola. (2018). *EL FINANCIAMIENTO DEL INTA: EL CASO DE LAS UNIDADES EJECUTORAS DE DOBLE DEPENDENCIA INTA-CONICET*. Retrieved from https://inta.gob.ar/sites/default/files/el_financiamiento_del_inta_el_caso_de_las_uedd.pdf.

¹⁹⁴ EUROCLIMAPLUS. (n.d.). EUROCLIMAPLUS: Manejo y restauración de bosques. Retrieved August 12, 2019, from <http://euroclimaplus.org/proyectos-bosques/manejo-y-restauracion-de-bosques>.

¹⁹⁵ El INTA, instituto clave en el desarrollo agropecuario de la Argentina. (n.d.). Retrieved August 13, 2019, from https://www.oei.es/historico/divulgacioncientifica/reportajes_457.htm.

¹⁹⁶ Corbett, M. (2019, March 18). Putting commitments into practice. *Forest 500*. Retrieved August 13, 2019, from <https://forest500.org/analysis/insights/putting-commitments-practice>.

4.3.2.2. *Louis Dreyfus Company & Vicentin Group policies*

The multinational agro-food company Louis Dreyfus Company (LDC) released its Soy Sustainability Policy in 2018.¹⁹⁷ This policy seeks to influence the soy supply chain and go beyond national laws and regulations by

- influencing and engaging with stakeholders to eliminate deforestation throughout our supply chain and conserve ecologically valuable biomes, aiming to discourage and eliminate conversion of native vegetation
- respecting the rights of local communities
- complying with all eight fundamental conventions of the International Labour Organization
- respecting protected areas, national and international
- protecting species classified as threatened, nationally or internationally
- abiding by rigorous anti-corruption and anti-bribery standards

The implementation of the policy in Argentina has seen some direct impacts.

These include an increased rigor and adherence to OTBN and PCUS regulations (see [section 4.3.1.1.](#)); requests for suppliers to present documentation related to their adherence to the respective national/regional forest laws by 2020; support and implementation of sustainability requirements as per recommendations by CARBIO (Cámara Argentina de Biocombustibles) or other recognized industry roundtables; and continued involvement in multi-stakeholder initiatives to advance sustainability agendas throughout the soy industry.¹⁹⁸

Another approach was taken by Vicentin Group. Vicentin Group is an agro-industrial company operating in various locations in Argentina, and which main product of export is biofuels and therefore follows the directive RED 2009/28/EC requirements on ‘the promotion of the use of energy from renewable sources’ as part of its internal policies. The main requirements of the directive that Vicentin lists are:

- Biofuel cannot be produced with biomass from areas that were natural forests ecological reserves, land with high biological content, etc., before 1st January 2008.
- The production of biofuel should include traceability from raw material to final product
- The reduction of greenhouse gas emissions should be at least 50 percent, in comparison with fuels of mineral origin
- Comply with applicable conventions and/or protocols on labour and social aspects.¹⁹⁹

To ensure the compliance with RED 2009/28/EC directive mandatory requirement Vicentin has opted to obtain a 2BSvs certification in 2012, which was renewed in 2017. This directive encourages companies, such as Vicentin, to measure and

¹⁹⁷ Louis Dreyfus Company. (n.d.). *Soy Sustainability Policy*. Retrieved August 13, 2019, from https://www ldc.com/files/9815/3432/4641/SSP_EN_FINAL.pdf.

¹⁹⁸ Louis Dreyfus Company. (n.d.).

¹⁹⁹ Vicentin - Soja Sustentable. (n.d.). Retrieved August 13, 2019, from <https://www.vicentin.com.ar/soja-sustentable?lang=en>.

report on their own greenhouse gas emissions for biofuel production.²⁰⁰ 2BSvS is a French biomass certification scheme established by seven grain producers in 2011. While the standard is accepted under the EU RED, it has been criticized as only just meeting minimum EU sustainability requirements.

4.3.2.3. *Farmers associations corporative sustainability policy*

Since 2014, Argentine Federated Farmers (AFA) has been trading sustainable soy within the framework of the RFS-2 EPA System developed by the United States Environmental Protection Agency. This framework aims to certify the traceability of biodiesel imported into the United States and to guarantee that the sourcing of soy is not linked to deforestation that occurred after 2007. As one of its requirements, it requires audits to be carried out by independent third parties to companies and associations, such as AFA, in order to guarantee compliance with the RFS-2 EPA System. The adoption of the RFS-2 EPA System by the AFA has generated great interest among soybean producers. Certified producers gain access to the U.S. market and get a premium price for the purchase of their sustainable soybean products.²⁰¹

4.3.2.4. *Sustainability standards*

Certified Sustainable Agriculture (ASC by in Spanish) is an Argentine standard established by the Argentine Association of Direct Sowing Producers (AAPRESID in Spanish) for the export of responsible soybeans into the EU. ASC addresses social and environmental aspects of sustainable production. These include responsible labor and production practices, relations with the community, use of water resources, as well as environmental impact management.²⁰² AAPRESID is a farmer association that promotes agricultural conservation practices and sustainable principles. This standard is the first Argentinian standard for soy bean production that was internationally recognized, being accepted by the European Feed Manufacturers Federation under its responsible purchasing guidelines²⁰³ and by the International Trade Centre (ITC).²⁰⁴

4.4 China

The involvement of Chinese soy supply chain actors in sustainability initiatives is relatively recent. [Table 8](#) provides an overview of the types of initiatives. Similar to Argentina, private sector efforts are concentrated on guidelines and standards. The Chinese government provides large subsidies for domestic soy production, it is not linked to any sustainability targets or goals. A number of initiatives have been initiated by international NGOs, such as the

²⁰⁰ Munoz, L., & Hilbert, J. A. (2012). *Global Bio Pact: Biocombustibles: El avance de la certificación de sustentabilidad en la Argentina*. Retrieved August 13, 2019, from https://inta.gob.ar/sites/default/files/script-tmp-inta_informe_tecnico_bionergia.pdf.

²⁰¹ AFA | Agricultores Federados Argentinos - Certificación soja sustentable. (n.d.). Retrieved August 13, 2019, from <http://afa.afascl.coop/soja-sustentable.php>.

²⁰² Aapresid Certificaciones. (2017). *Protocolo del sistema de gestión de la calidad y prácticas productivas sustentables*. Retrieved August 13, 2019, from <https://www.aapresid.org.ar/wp-content/uploads/2018/09/Protocolo-ASC-Revisi%C3%B3n-3-Formato2018-Marzo-2017.pdf>.

²⁰³ ASC, el Standard argentino recomendado para la compra responsable en UE. (2018, June 26). *Aapresid*. Retrieved August 13, 2019, from <http://www.aapresid.org.ar/blog/asc-el-standard-argentino-recomendado-para-la-compra-responsable-en-ue/>.

²⁰⁴ Agricultura sustentable: la certificación de Aapresid ahora también tiene alcance internacional. (n.d.). *Agrovoz*. Retrieved August 13, 2019, from <http://agrovoz.lavoz.com.ar/agricultura/agricultura-sustentable-certificacion-de-aapresid-ahora-tambien-tiene-alcance-internacio>.

Sustainable Soy Trade Platform led by Solidaridad, TNC, WWF and the Paulson Institute. Lately, a number of sustainability initiatives have emerged which are led by actors closer to the public sphere, such as in the case of China's Meat Association or COFCO recent pledges to tackle deforestation.

Table 8 Summary of policy instrument in China

Policy Instrument /Initiative	Aim	Type	Year	Scope	Potential/ Limitations
Subsidy program for domestic soy production	Incentivize the shift from maize to soybean production in China.	Subsidies	2018	National	Subsidy program in function and China's 2019 soy production is forecast to increase to it's second highest on record. Soy production constrained by domestic soy food demand.
COFCO's Sustainable Soy Sourcing Policy	Ensure the sustainability of soy sourced by COFCO.	Sourcing guideline standards	2019	International	Policy in the process of being established and access to verifiable information limited.
China Responsible Soy Sourcing Guideline (CRSSG)	Design and disseminate a sourcing guideline for Chinese actors to promote best practices in soy supply chain engagement.	Sourcing guidelines standards	2018	National	CRSSG counts with the support of some major public and private companies. Still under design and adoption will depend on public authorities support.
Sustainable Soy Trade Platform (SSTP)	Bridge between Chinese and global players in sustainable soy.	Stakeholder engagement	2015	Global	Domestic soy market is not typically concerned with embedded deforestation imports.

4.4.1 Public sector support for local producers

Following the 2018 – and ongoing – trade conflict with the U.S. (see [section 2.1](#)), the Chinese government introduced a new subsidy program to support domestic production of soy in certain provinces. The subsidy program builds on an existing subsidy scheme, but offers increased pay outs to further stimulate domestic production in China's northeast. The subsidies would reduce the dependence of China on foreign soy imports, potentially reducing negative SDG spill-over effects. The implementation of the subsidy is already underway. In Heilongjiang, the largest soybean-producing province, the subsidy payment in 2019 amounted to RMB 5,100 (USD 724 in November 2019) per hectare.^{205,206} The government is also piloting the introduction of subsidies in other parts of the country.²⁰⁷ As of 2019, the planted soybean area in China has increased to 8.85

²⁰⁵ Subsidies encourage farmers to grow more soybeans - Chinadaily.com.cn. (2019, May 15). Retrieved August 13, 2019, from <http://www.chinadaily.com.cn/a/201905/15/WS5cdb4c3ba3104842260bb9cd.html>.

²⁰⁶ Subsidies encourage farmers to grow more soybeans - Chinadaily.com.cn. (n.d.). Retrieved July 31, 2019, from <http://www.chinadaily.com.cn/a/201905/15/WS5cdb4c3ba3104842260bb9cd.html>.

²⁰⁷ Wang, X., & Zhou, H. (2019, July 24). Subsidies help soybean farmers grow their business - Chinadaily.com.cn. Retrieved August 13, 2019, from <http://www.chinadaily.com.cn/a/201907/24/WS5d37aa7ca310d83056400a34.html>.

million hectares, an increase of 5.4 percent year-on-year.²⁰⁸ This increase is mostly concentrated in the region of Heilongjiang and is derived principally from a minor shift from corn to soybean production.

Domestic production of soy in the market year 2019/20 is projected to grow to 16.8 million tons, representing a 5.7 percent year-on-year rise.²⁰⁹ According to the Ministry of Agriculture and Rural Affairs' Soybean Revitalization Plan (released in January 2019), the area of soybean cultivation is to reach 10 million hectares by 2020. This growth trend is linked to the increase subsidy program, which has incentivized farmers to expand into soy production at the expense of other crops, such as corn.²¹⁰ As China, has suffered for the past years of an oversupply of corn, for which in 2018 over 99 percent of its supply was produced domestically, no spillover effects are expected neither in terms of import increase of corn nor domestic under supply.²¹¹

4.4.2 Corporate commitments

Fifteen companies headquartered in China or Hong Kong are included in the Forest 500 as part of the most influential companies in soy supply chains. In total, however, 94 of those global influencers are active in soy trade or processing in China. Only one of the 15 most influential companies, namely COFCO, have a commitment to protect forests in their sourcing of soy. Similarly, only 19 of the 94 companies operating in China have a soy commitment.²¹²

Similar to the findings in Brazil, Argentina and the EU, the Forest 500 analysis indicates that a gap exists between voluntary commitments and their implementation. While ten of the 19 companies with soy commitments have reported on their progress in implementing their commitment, only four companies clearly reported the total volume of soy that they buy, as well as the share of the volume compliant with their commitment. In general, voluntary corporate commitments are less common in companies operating in China than in the EU.²¹³

However, COFCO's commitment to sustainable sourcing and responsible production of soy is noteworthy as the company plans to significantly expand soy sourcing.²¹⁴ COFCO is China's largest state-owned food trader, processor, and manufacturer. In 2017, it was reported that COFCO was responsible for 7.75 percent of Chinese soybean imports from Brazil and 14.25 percent from Argentina.²¹⁵ The company plans to significantly expand soy sourcing

²⁰⁸ Scott, R., & Nguema, A. (2019). *Peoples Republic of China - Oilseeds and Products Update: No Change in Sight for China's Lowering Soybean Demand*. Retrieved August 13, 2019, from https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Oilseeds%20and%20Products%20Update_Beijing_China%20-%20Peoples%20Republic%20of_7-2-2019.pdf.

²⁰⁹ Scott, R., & Nguema, A. (2019).

²¹⁰ Subsidies encourage farmers to grow more soybeans - Chinadaily.com.cn. (2019, May 15).

²¹¹ Agricultural Market Information System Statistics. (2019).

²¹² Forest 500. (2019).

²¹³ Forest 500. (2019).

²¹⁴ COFCO International. (2018a). *2018 Sustainability Report*. Retrieved July 29, 2019, from <https://www.cofcointernational.com/sustainability/sustainability-reports/2018-sustainability-report/>.

²¹⁵ TRASE. (n.d.-a). TRASE. (n.d.-a).

and it is committed to sustainable sourcing and responsible production.²¹⁶ This is evident in the following policies it has implemented in the past five years:²¹⁷

- Signatory to the Amazon Soy Moratorium (see [section 4.2.3.1](#)), member of the Soft Commodities Compact (see [section 4.1.3](#)), the Cerrado Working Group (see [section 4.2.3.2](#))
- Working with public and private stakeholders under the Mato Grosso's Produce, Conserve and Include strategy, with the objective to support and incentivize sustainable agricultural production.
- Sourcing 2BSvS certified soy from Argentina, and under the International Sustainability and Carbon Certification, which ensures environmentally sustainable production and traceable supply chains.
- Establishing a sustainable soy sourcing policy, which has a set of requirements for soy suppliers in Brazil's Cerrado and Amazon.²¹⁸ Suppliers are required to uphold Brazilian law with regards to respect for High Conservation Value areas, registration in the Brazilian Rural Environmental Cadastre (CAR), the Amazon's Soy Moratorium, and respect for indigenous peoples, among other things.
- Collaborating with WWF and TNC to map environmental and social risk hotspots across their soy supply chain.
- Joining the Tropical Forest Alliance (TFA).
- Signatory to an agreement with 20 banks for a three-year USD 2.1 billion loan tied to sustainability performance. The loan marks the largest ever credit facility for a commodity trader, with interest rates linked to COFCO's sustainability performance.²¹⁹ Loan targets include: year-on-year improvement in environmental, social and corporate governance performance and increasing traceability of agri-commodities (as a prerequisite to building sustainable supply chains) with a special focus on Brazilian soy.²²⁰

COFCO's activities have potential to contribute to a more sustainable soy supply chain. While drawing conclusions is hindered by a lack of data, some progress has been recorded. For instance, COFCO has geo-mapped for environmental and social risk 1.1 million hectares in Brazil.

While COFCO is committed to eliminating deforestation from its soy supply chain, most of the initiatives in which it is engaged are in early stages of implementation. This makes assessing their effectiveness difficult. COFCO's Sustainably Soy Sourcing Policy will be limited in its effectiveness in a market where other buyers would gladly purchase soybeans from suppliers rejected by COFCO. Moreover, private sector initiatives usually rely on the existence and enforcement of public sector regulation, including long-term policy signals. This is clear in COFCO's Sustainable Soy Sourcing Policy as well, which repeatedly references Brazilian legislation as the benchmark against which soy suppliers will be held accountable. The policy also relies on national authorities for

²¹⁶ COFCO International. (2018a).

²¹⁷ COFCO International. (2018b). *2018 Sustainability Report*. Retrieved July 29, 2019, from <https://www.cofcointernational.com/sustainability/sustainability-reports/2018-sustainability-report/>.

²¹⁸ COFCO International. (2019). *Sustainable Soy Sourcing Policy* (No. 01) (No. 01). Retrieved July 29, 2019, from <https://www.cofcointernational.com/media/1330/sustainable-soy-sourcing-policy.pdf>.

²¹⁹ Thoenes, P. (ESTM). (2019). *Oilseeds, Oils & Meals: Monthly Price and Policy Update*.

²²⁰ Thoenes, P. (ESTM). (2019).

enforcement.²²¹ Due to the current political climate in Brazil (section 2.2.3) this may raise environmental risks.²²²

4.4.3 Public-private dialogue

The Sustainable Soy Trade Platform (SSTP) serves as a bridge between Chinese and global players in sustainable soy, aiming to mobilize Chinese soy stakeholders to engage in sustainable soy sourcing.²²³ It was established in 2015 by the Paulson Institute, WWF, Solidaridad, and TNC. The platform works with industry, government, finance and academic stakeholders working on sustainable soy in China.

Some of the strengths of SSTP include its approach to engage Chinese stakeholders, putting Chinese companies into the lead of developing sourcing guidelines. Currently, the Chinese soy industry is developing China Responsible Soy Sourcing Guidelines (CRSSG) in a collaborative process under the SSTP umbrella.²²⁴ This includes showcasing international best practices in soy supply chain engagement. Once in place, the guidelines will support Chinese soy supply chain actors to develop responsible, traceable sourcing strategies.²²⁵ The development of the guidelines enjoys political support and includes government representatives on the Advisory Board and as part of the External Review Group. This high-level government endorsement is a key enabler to Chinese companies adopting these guidelines. Once approved, the guidelines therefore have potential to be scaled.

However, several limitations slow down the development of the guidelines. While COFCO international, a front runner in moving towards sustainable soy, faces international exposure and is sensitive to its international public image, it is not generally the case of other Chinese soy supply chain actors which are mostly driven by the Chinese market context and therefore domestic stakeholders. Moreover, the national market is not typically concerned with deforestation embedded in commodity imports, with issues around food safety and security of supply being higher on the agenda. Strong government support for the SSTP is therefore needed if it is to have real impact. Furthermore, true engagement in sustainable soy supply is only realistic at a time of company profit margins. The current political climate means that many Chinese companies – especially those in the swine industry - are facing losses. The African swine flu has wiped out almost 30 percent of swine herds, and the trade conflict with the U.S. has raised import taxes on U.S. soy (see [section 2.1](#)).

²²¹ COFCO International. (2019).

²²² Brazil right-wing government puts gag order on environment agency. (2019, March 13). *Reuters*. Retrieved August 13, 2019, from <https://www.reuters.com/article/brazil-environment-idUSL1N2101V2>; Under Brazil's Far-Right Leader, Amazon Protections Slashed and Forests Fall - The New York Times. (n.d.). Retrieved July 30, 2019, from https://www.nytimes.com/2019/07/28/world/americas/brazil-deforestation-amazon-bolsonaro.html?utm_source=Nature+Briefing&utm_campaign=5e2fd2a973-briefing-dy-20190729&utm_medium=email&utm_term=0_c9dfd39373-5e2fd2a973-43259121.

²²³ Solidaridad. (2018, June 19). First Steps Towards Responsible Soy Sourcing Guidelines for China. *Solidaridad Network*. Retrieved July 31, 2019, from <https://www.solidaridadnetwork.org/news/first-steps-towards-responsible-soy-sourcing-guidelines-for-china>.

²²⁴ Nepstad, I. (n.d.). *China Responsible Soy Sourcing Guidelines*. Presented at the Solidaridad. Retrieved from http://www.responsiblesoy.org/wp-content/uploads/2018/06/Isabel-Neptad_-SolidaridadChina_RT13.pdf.

²²⁵ Solidaridad. (2018, June 19).

4.5 European Union

There are various sustainability initiatives that promote the sourcing of sustainable soy in the EU. Table 9 outlines the range of instruments, from industry standards (e.g. FEFAC's guidelines for responsible soybean sourcing) to government policies (e.g. France's National strategy to combat imported deforestation²²⁶). High-level policies, in particular trade regulation, dominate the EU's strategy towards reducing demand-driven deforestation. However, they do not specifically target soy. Major initiatives include the Amsterdam Declarations Partnership, the EU Communication on Stepping up EU Action to Protect and Restore the World's Forests and FEFAC's Responsible Sourcing Guidelines.

Table 9 Summary of policy instruments in the EU

Policy Instrument /Initiative	Aim	Type	Year	Scope	Potential/ Limitations
Amsterdam Declarations Partnership (ADP)	To eliminate deforestation from agricultural commodity supply chains in Europe by 2020 by supporting the implementation of existing private and public sector commitments	Stakeholder engagement	2015	EU-level	Major initiatives supported by ADP in supply chains of major drivers of deforestation. Integration of Chinese private and public stakeholders very limited.
Sustainable Protein Feed Forum	Facilitates exchange between all major food retailers in Germany, organized by the German Federal Ministry of Food and Agriculture, BMEL.	Stakeholder engagement	2015	Germany	A call for the feed sector to source 100% of certified soy was launched in 2017. Some forum members are setting their respective goals.
EU Communication on Stepping up EU Action to Protect and Restore the World's Forests	To put into the agenda of EU stakeholders the issues and potential pathways for actions related to stop deforestation.	Action plans/ regulations	2019	EU-level	No deadlines or targets, and implementation is dependent on the newly elected Commission and willingness EU member states.
Forest Law Enforcement, Governance, and Trade (FLEGT) Program	Reduce deforestation driven by timber production by improving the regulatory framework and the governance of the timber supply chain.	Trade regulation	2003	EU-level	Positive replicable results for timber driven deforestation but no active Voluntary Partnership Agreements (VPA) between the EU and Brazil or Argentina.
Mandatory due diligence	A combination of legal requirements and disclosure through public reporting to prevent	Trade regulation		EU-level	Many of the existing disclosure and reporting regulations only apply to a subset of the largest companies and don't

²²⁶ Cossart, S., Chaplier, J., & Beau de Lomenie, T. (2017, June 15). The French law on duty of care: A historic step towards making globalization work for all | Business & Human Rights Resource Centre. Retrieved August 13, 2019, from <https://www.business-humanrights.org/en/the-french-law-on-duty-of-care-a-historic-step-towards-making-globalization-work-for-all>.

	import embedded deforestation.				cover the soy supply chain.
Reviewed Renewable Energy Directive	Sets new limits on the volume of high-risk Indirect Land Use Change (ILUC) biofuels that can be counted towards renewable energy targets, ultimately reducing it to zero in 2030.	Trade regulation	2018	EU-level	Soy is not classified as a high ILUC risk biofuel.
Mercosur Trade agreement	Both trading blocs commit to deliver on the Paris Agreement, specifically that neither party can weaken domestic environmental or labor laws for trade and investment.	Trade regulation	2019	Latin America	Ratification of the agreement will take time and not guaranteed. The enforcement of deforestation related clauses might take place in the long term.
EU Observatory on Deforestation	To improve transparency on deforestation and its drivers in the EU.	Transparency / Reporting	2019	EU-level	It is one of the key proposals integrated in the EU Communication on Stepping up EU Action to Protect and Restore the World's Forests
National Deforestation Platform	Provide up-to-date information on deforestation alongside best practices in France	Transparency / Reporting	2018	France	Announced in 2018, no implementation progress so far.
Monitoring framework in the 25 Years Environment Plan	Framework to include indicators on environmental impacts overseas linked to UK consumption of key commodities.	Transparency / Reporting	2019	United Kingdom	Initial proposals to include an indicator on the percentage of certified soy were not included due to low market coverage of certified soy.
Development Cooperation Projects (EuroClima+)	<ul style="list-style-type: none"> • Forest Management and Restoration in productive environments • Participatory Environmental Governance: Integrating the challenges of climate change in the Great American Chaco 	Public extension programs		Latin America	Engages the key public actors but small size of projects limits their reach.
Development Cooperation Projects (GIZ and KfW)	<ul style="list-style-type: none"> • Partnerships for Innovation in Tropical Forest Protection in the Amazon. • Rural Environmental Register. • Green Financial Market Regulation and Green Bonds 	Public extension programs; transparency/ reporting; targeted financial instruments		Latin America	Diverse and strategic set of projects but highly dependent on partner public authorities' willingness and agenda.

Soy Sourcing Guidelines by the European Feed Manufacturer s' Federation (FEFAC)	Promote criteria and procedures to ensure that Feed industry soy providers reduce the soy embedded deforestation in their supply chain.	Sourcing guideline standards	2015	EU-level	These guidelines have quickly become a reference in the soy supply chain market destined to the EU. Their enforcement can be verified only through few existing standards that comply with the requirements of the guidelines.
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4.5.1 Strategic stakeholder dialogue: Amsterdam Declaration

The Amsterdam Declarations Partnership (ADP) is a multi-stakeholder initiative launched in 2015. Seven governments (Denmark, France, Germany, Italy, the Netherlands, Norway and the United Kingdom) have signed two pledges to eliminate deforestation from agricultural soy and other agricultural commodity supply chains in Europe by 2020.²²⁷ The ADP supports the implementation of existing private and public sector commitments by

- Engaging the European Commission to link the reduction of impact of value chains on deforestation to EU climate, forest, biodiversity and trade action, as well as prepare common lines for Council conclusions and other formal means.
- Stimulating the Global Value Chain²²⁸ approach for agricultural commodities. In the case of soy supply chains, this means engaging with public-private partnerships to identify organizational capacity in value chains.
- Enhancing the dialogue with consumer and producer countries, such as Brazil, China, India and Indonesia.
- Stimulating the use of voluntary CSR reporting on forest impacts, track voluntary commitments, as well as exchange lessons learned with other initiatives that could be built upon (e.g. Transformative Transparency Platform).

The ADP support unit as well as the signatory countries have hosted a number of formal and informal dialogues with an array of supply chain actors and stakeholders at the national level in consumer and producer countries.

The aim of these discussions is to facilitate cooperation, synergies, exchange lessons learned, improve transparency and create momentum towards deforestation-free soy. This ADP relies on a well-established network of supporters with some leverage over policy-making. Multiple coordination meetings and multi-stakeholder events have taken place over the past four year (e.g. the 2017 and 2018 'European Soy Meetings').²²⁹

Nonetheless, while some companies have committed to deforestation-free soy in voluntary pledges, there is no comprehensive sectoral agreement or pledge behind the ADP. A 2019 report indicates that out of 180 companies in ADP countries, only 24 percent have a zero or net zero deforestation commitment

²²⁷ Amsterdam Declaration Partnership. (2016). *Strategy Amsterdam Declarations Partnership*. Retrieved from <https://bit.ly/2MqDobR>.

²²⁸ This approach describes the actors and steps involved in the production of a good or service, taking into account the entire supply chain.

²²⁹ Amsterdam Declarations Partnership. (2018a). *Soya*. Retrieved from <https://ad-partnership.org/wp-content/uploads/2018/10/AD-Monitoring-sheet-SOY-v2018-1002.pdf>.

in the soy supply chain.²³⁰ Demand for sustainable soy remains low in the EU, something the ADP seeks to address through active involvement to supply-chain companies. Low demand for certified soy in Europe, a growing Chinese market that does not pose restrictions and offers an alternative route for producer countries such as Brazil and a changing political climate in some producer countries (e.g. Brazil) limits the overall demand of certified soy.²³¹

So far, the impact of the ADP on the soy supply chain remains unclear. There are no data on improvements in the soy supply chain. The Secretariat mainly relies on secondary data and cannot make clear links as to how much trade of commodities is linked to deforestation.²³² Moreover, even when data exists, it is unclear how companies are implementing their commitments, which may mislead conclusions as to their progress. However, the ADP monitors the implementation of the Amsterdam Declaration by measuring qualitatively how the initiative is influencing policy and political discourse, as well as by recording individual efforts by signatory countries and recording voluntary commitments by companies in their countries.

4.5.2 EU Communication on Forests

On 23 July 2019, the European Commission adopted an EU Communication on Stepping up EU Action to Protect and Restore the World's Forests.²³³ The Communication has the objective of protecting and improving the health of existing forests, especially primary forests, and significantly increasing sustainable, biodiverse forest coverage worldwide. It sets out five priorities:

- Reduce the footprint of EU consumption on land and encourage the consumption of products from deforestation-free supply chains in the EU;
- Work in partnership with producer countries to reduce pressures on forests and to “deforestation-proof” EU development cooperation;
- Strengthen international cooperation to halt deforestation and forest degradation, and encourage forest restoration;
- Redirect finance to support more sustainable land-use practices;
- Support the availability and quality of information on forests and commodity supply chains, the access to that information, and support research and innovation.

These include also a number of proposals that lay the ground for future regulatory measures targeting the trade in forest-risk commodities. These include promoting trade agreements that encourage trade in deforestation-free agricultural and forest products and continuing to analyze the case for mandatory due diligence.

Non-transparent supply chains, as well as their complex nature, can pose significant barriers to addressing deforestation linked to the soy supply chain. Greater transparency and access to information can allow retailers and

²³⁰ Forest 500, & Trase. (2019). *Eliminating deforestation from supply chains by 2020: a review of the Amsterdam Declaration countries*. Retrieved July 31, 2019, from <https://bit.ly/2ZkWNOV>.

²³¹ IDH, & IUCN National Committee of the Netherlands. (2019).

²³² Amsterdam Declarations Partnership. (2018b). *Status Report*. Retrieved from <https://bit.ly/318d36j>.

²³³ European Commission. (2019, July 23).

manufacturers to identify deforestation and socio-environmental risks in their supply chains; especially by tracing the place of soy production and verifying whether soy is being sourced from deforested areas. Such information can also support governments and civil society to monitor and report associated environmental impacts linked to soy supply chains, creating a spill-over effect in producer countries. Greater transparency thus exposes practices of producer countries and may thereby encourage companies, particularly those in the production of soy, to adhere to sustainable practices when sourcing soy.

As part of the EU communication, the EU suggests setting up an EU Observatory on deforestation. Such observatory would provide information on deforestation and drivers of deforestation, aiming to benefit governments, companies and consumers wanting to participate in soy supply chains.

These policies have potential to improve access to information and transparency. However, significant barriers persist. The use of trade data is essential for transparent soy supply chains. Such detailed data on exports and imports that includes the names of companies trading soy is not available for the EU. This is reflected in current approaches to SDG reporting by the EU which does not include negative environmental and social spill-over impacts associated with soy imports.

While forming part of a “Green new deal for Europe” and backed by significant political will, the communication does not include any deadlines or targets and as such the proposed actions remain vague. Furthermore, the timing of this Communication means that it will be up to the newly elected Commission to review and take forward these proposals.

4.5.3 National demand-side measures

The French government is developing a national deforestation platform intended to improve transparency and provide greater access to information, as part of its National Strategy to End Deforestation in Imports.²³⁴ The platform will provide up-to-date information on deforestation in supplier countries, alongside best practice on reducing deforestation risks.

The UK government has taken steps to improve supply chain reporting in its 25 Years Environment Plan released in 2019. The plan sets out a monitoring framework that includes indicators on environmental impacts overseas linked to UK consumption of key commodities. Initial proposals to include an indicator on the percentage of certified soy were not included in the final monitoring framework, in part due to low coverage of market by certified soy, and the framework notes that more research on possible methods and data is needed to finalize how this indicator will be measured.²³⁵

²³⁴ Ministère de La Transition Ecologique et Solidaire. (n.d.). *Strategie Nationale de lutte contre la deforestation importee 2018-2030*. Retrieved August 13, 2019, from https://www.ecologique-solidaire.gouv.fr/sites/default/files/2018.11.14_SNDI_0.pdf.

²³⁵ UK Department for Environment Food & Rural Affairs. (2019). *Measuring environmental change: outcome indicator framework for the 25 Year Environment Plan*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/802094/25-yep-indicators-2019.pdf.

The government of the Netherlands has also taken the path to improve public procurement sustainability. The national manifesto on sustainable procurement launched in 2012 reached the support of 160 local public institutions by 2019.²³⁶ In addition, in 2016 the Dutch Public Procurement act was adopted and the Dutch government developed a set of criteria and tools to support the implementation of sustainable procurement.²³⁷

4.5.4 Public sector support for producers (sustainability initiatives)

4.5.4.1. Sustainability criteria in trade agreements

After 20 years of negotiations, in June 2019 the EU reached a political agreement on a trade agreement with Mercosur - a trade bloc that includes Argentina Brazil, Paraguay, and Uruguay.²³⁸ The agreement is wide ranging covering sectors from agriculture to manufacturing and pharmaceuticals. The agreement is based on the premise that trade should not damage environmental or labor conditions, and as such includes a commitment for both trading blocs to deliver on the Paris Agreement which includes Brazil's existing pledge under its NDC to end illegal deforestation and reforest 12 million hectares.

Specifically, the sustainable development chapter of the agreement establishes that neither Party (i.e. Mercosur countries or EU) can weaken domestic environmental or labor laws to promote trade and investment. It also includes an article on promoting corporate due diligence within supply chains and supporting public and private initiatives to halt deforestation linked to supply chains.²³⁹

Nonetheless, the agreement reduces or eliminates export tariffs on soybean products from Mercosur, which could increase demand for soy as biofuel and as animal feed in Europe. However, Mercosur already accounts for nearly three-quarters of EU soy imports and thus the new agreement is unlikely to have a significant effect in further increasing demand.²⁴⁰

4.5.5 Initiatives sponsored by the Government of Germany or the EU Commission

4.5.5.1. Forum sustainable protein feed and EU soy production

The Sustainable Protein Feed Forum (Forum Nachhaltige Eiweißfuttermittel) was established by the German Federal Ministry of Food and Agriculture (BMEL) in 2015. Its main aim is to facilitate the exchange between stakeholders of the value chain, and most major food retailers in Germany engage

²³⁶ Directorate-General for Environment. (2019). *The EU Environmental Implementation Review 2019 Country Report - THE NETHERLANDS*. Retrieved from https://ec.europa.eu/environment/eir/pdf/report_nl_en.pdf.

²³⁷ Pianoo - Dutch Public Procurement Expertise Centre. (n.d.). *Sustainable Public Procurement (SPP)*. Retrieved from <https://www.pianoo.nl/en>.

²³⁸ European Commission. (2019b). EU-Mercosur [European Commission]. *EU-Mercosur*. Retrieved from https://ec.europa.eu/trade/policy/in-focus/eu-mercousur-association-agreement/index_en.htm.

²³⁹ European Commission, & Mercosur. *EU-Mercosur Trade Agreement: Chapter Trade and Sustainable Development*. , (2019). Retrieved from https://trade.ec.europa.eu/doclib/docs/2019/july/tradoc_158166.%20Trade%20and%20Sustainable%20Development.pdf.

²⁴⁰ United Nations Statistics Division. (2019b). *UN Comtrade | International Trade Statistics Database*. Retrieved March 14, 2019, from <https://comtrade.un.org/data>.

in it. The Forum is considered a relevant space for convening discussions on demand-side measures to reduce spill-over effects from soy imports.²⁴¹ Members to the Forum issued a joint position paper in 2017, calling for the purchase of hundred percent sustainably certified soybean imports. More recently, a dialogue meeting on deforestation-free supply chains was held, with an aim to discuss potential measures to stopping commodity-driven deforestation. The Forum also fosters domestic strategic dialogues on soy sustainability. In addition to sourcing more sustainable soy, members are considering to optimize feed ratios by substituting soy content and sourcing more domestic or EU soy.²⁴²

On the other hand, the Danube Soy Initiative promotes and supports the domestic production of soy at EU level, among others to substitute imported soy. This organization, which is supported by public actors via the EU Soy Declaration, counts with 280 members who participate in the EU soy supply chain. Soy farmers, big food retailers, civil society organizations, and other private actors are examples of current members. The Danube Soy Initiative has also developed a soy standard with strict socio-economic and environmental requirements that allows to ensure the sustainability of the soy produced by its members. In general, the soy certified by the Danube Soy Initiative performs highly in terms of ecosystem protection provisions and a bit less in terms of standard's level of assurance.²⁴³

However, the aim to substitute imported soy with domestic production faces a number of limitations. In the EU, the high level of costs associated to the production of certified non-GMO soy makes it less competitive than the non-certified soy produced in Brazil and Argentina. In particular due to the fact that EU's soy domestic production is mostly destined for food whereas the imported soy for feed, which quality and prices are lower. In addition, upscaling the EU soy production volumes need to be accompanied by an increase if the demand for EU soy products to avoid price spillover effects.

4.5.5.2. *Development cooperation*

Multiple programs financed by ODA at the EU and German level relate to soy supply chains. At the EU level, two regional projects financed by Euroclima+ aim to enable an environment for sustainable soy production:

- *Forest Management and Restoration in productive environments.* This project aims to strengthen capacities of public institutions responsible for rural extension services in Argentina, Brazil, Paraguay and Bolivia. In particular, the project aims to improve capacities related to land-use planning in forest frontiers, as well as forest monitoring and reporting.²⁴⁴
- *Participatory Environmental Governance: integrating the challenges of climate change in the Great American Chaco.* This project supports the strengthening and participation of local civil society in land-use planning and decision-making processes in Argentina and Paraguay. It focuses on

²⁴¹ Forum sustainable protein feed. (2017). *Positionierung des „Forums nachhaltigere Eiweißfuttermittel“ zu nachhaltigeren Eiweißfuttermitteln*. Retrieved from https://www.eiweissforum.de/wp-content/uploads/2017/10/Positionspapier_19102017-1.pdf.

²⁴² Forum sustainable protein feed. (2017).

²⁴³ Kusumaningtyas, R. (2019).

²⁴⁴ EuroClima+. (n.d.-a). EuroClima+: Forest Management and restoration. Retrieved from <http://euroclimaplus.org/en/projects-forest/forest-management-and-restoration>.

indigenous organizations and rural associations.²⁴⁵

Both projects by Euroclima+ have potential to be scaled and strengthen sustainable soy supply chains. The project on forest management and restoration could provide an entry point for mainstreaming sustainable best practices for soy production in Argentina and Brazil (section 4.3.1.2). The project, which is planned to be implemented over the next 32 months, currently counts with a budget of less than EUR 900,000. The other project could improve the implementation and enforcement of the Argentine forest law framework ([section 4.3.1.1](#)).

Another flagship project at the EU level includes the Forest Law Enforcement, Governance and Trade (FLEGT) program. The 2003 EU FLEGT Action Plan sets out several measures to address illegal logging of the world's forests – spanning both supply side actions to promote the supply of legal timber and demand side measures to increase demand for legal timber. It requires the signing of Voluntary Partnership Agreements (VPA) between the EU and timber-exporting countries (such as Indonesia) to assure the legal harvesting and trading of timber. Its requirement for a licensing procedure and a traceability system have proven effective at reducing imports of illegal timber to the EU. The more recent FLEGT implementation Work Plan 2018-2022 responds to weaknesses and challenges identified in the 2016 evaluation – this includes a recognition of the need to cooperate and encourage action by other consumer markets for timber to avoid leakage of illegal timber.

In Germany, the GIZ and KfW count with a few projects abroad on soy production. Some examples include

- *Partnerships for Innovation in Tropical Forest Protection in the Amazon.* This project focuses on traceability in the livestock supply chain, although it may also cover soy and wood in the near future. This project financed by the German Ministry of Economic Cooperation and Development is on hold in reaction to the lack of will by the new Brazilian government to continue policies to stop deforestation. However, negotiations are making progress and implementation should start end of this year.
- *Rural Environmental Register.* A project co-financed with the World Bank, which aims to strengthen the monitoring of the supply chain. In particular, it aims to strengthen the operational capacities of the Brazilian Forest Service (SFB) to establish legal and normative requirements for the introduction and implementation of environmental regulatory instruments.
- *Green Financial Market Regulation and Green Bonds.*, a (further) development of financial products in the area of deforestation-free supply chains could play a role in the future. One possibility is to link existing instruments for the securitization of receivables in agriculture (Certificados de Recebíveis do Agronegócio (CRA)) with sustainability criteria.²⁴⁶

²⁴⁵ EuroClima+. (n.d.-b). Participatory environmental governance. Retrieved from <http://euroclimaplus.org/en/projects-forest/participatory-environmental-governance>.

²⁴⁶ GIZ. (2019). Land and environmental management – Cadastro Ambiental Rural (CAR). GIZ. Retrieved from <https://www.giz.de/en/worldwide/34060.html>.

There are also other projects in the pipeline. One of them is a cooperation with the Brazilian Ministry of Agriculture (MAPA) by the end of 2019 for a EUR 18 million program on scaling successful approaches linked to deforestation-free supply chains.

4.5.6 Private initiatives

4.5.5.1. *FEFAC sourcing guidelines*

The European Feed Manufacturers' Federation (FEFAC) has produced soy sourcing guidelines. These guidelines enable responsible soy sourcing schemes to be evaluated and benchmarked against the federation's criteria. The guidelines comprise 37 essential and 22 desired criteria that cover legal compliance, responsible working conditions, environmental responsibility, good agricultural practices, respect for land rights and community relations. An online benchmarking system lists approved soy sustainability schemes that are compliant with a core number of FEFAC criteria and verification requirements.²⁴⁷

So far, 17 soy schemes have been approved as compliant with FEFACs guidelines but only eight of these are considered to be deforestation free according to the European Soy Monitor.²⁴⁸ According to studies recently conducted by IUCN and IDH, only 22 percent of soy used in the EU is compliant with FEFAC guidelines and 13 percent is certified deforestation-free. Percentages tend to be significantly higher in northern European countries. While the criteria cover a broad spectrum of issues, they focus on legal requirements, such as assessing the volume of high value habitat of a particular area. The lack of more qualitative and detailed criteria renders the guidelines less ambitious than the minimum criteria laid out by the Retailers Soy Group or the Consumer Goods Forum.

4.5.5.2. *Corporate commitments and disclosure*

The Forest 500 analysis includes 45 (out of 168) companies headquartered in the EU as part of a list of the most influential companies in soy supply chains. These companies primarily consist of manufacturers (including animal feed manufacturers) and retailers at the consumer end of the supply chain. Out of these 45 companies, 18 have a commitment to protect forests in their sourcing of soy.

In comparison to commitments related to palm oil or timber, soy commitments by EU companies are fewer. Moreover, commitments related to soy in the EU are often weaker in ambition and implementation in comparison to palm oil and timber commitments.²⁴⁹ For instance, they may only focus on a particular geography or biome. Forest 500 found that the majority of companies with soy commitments scored one of none of the indicators assessing implementation (11 out of 18) and only 3 companies clearly reported the total volume of soy that they buy, and the volume that they know to be compliant with their commitment.²⁵⁰

²⁴⁷ Kusumaningtyas, R. (2019).

²⁴⁸ IDH, & IUCN National Committee of the Netherlands. (2019).

²⁴⁹ Forest 500. (2019).

²⁵⁰ Corbett, M. (2019, March 18).

EU Member States and stakeholders are already engaging to scale up and strengthen corporate commitments but more could be done. The Amsterdam Declaration (see [section 4.5.1](#)) is one such example. Several Member States have also set up national roundtables to support private sector action on soy. In the UK, the Roundtable on Sustainable Soya aims to encourage collaboration between companies who are facing similar sustainability issues. The Roundtable has led to new corporate commitments, including a general pledge by all involved companies to develop and regularly disclose implementation action plans. Nonetheless, the Forest 500 analysis suggests that voluntary commitments are not enough and that regulation on corporate due diligence is required to enable action across the sector.

4.5.7 Measures with potential impact on the soy supply chain

There are also a number of measures that are not geared towards the soy supply chain or -if they are- fail to define sustainability requirements but hold the potential to contribute to the alignment soy production and trading with SDGs.

4.5.6.1. *Mandatory due diligence/company reporting*

Mandatory due diligence defines a legal requirement for companies to conduct checks on their supply chains, operations and investments to identify, prevent and mitigate environmental and social impacts. In the EU, there is mandatory due diligence legislation including the EU Timber Regulation and the EU Minerals Regulation – both covering specific commodities - as well as the proposed EU Sustainable Finance Disclosure regulation, which has a broader remit. Several Member States have also adopted due diligence laws, including the French Law of Corporate Due Diligence and the UK's Modern Slavery Act.

A key component of due diligence is disclosure through public reporting on policies and practices. The EU Non-Financial Reporting Directive 2014²⁵¹ also requires large public-interest companies, including listed companies, banks and insurers, to disclose information in their annual report on their policies on human rights, environmental protection and social responsibility. However, while the EU has published guidelines on how to report, such guidance is not mandatory and a recent review of its effectiveness suggests that the information reported by most companies is not sufficiently detailed to be useful for investors.²⁵²

Furthermore, many of the existing disclosure and reporting regulations only apply to a subset of the largest companies, limiting their effectiveness. National legislation on due diligence that has been adopted or are being discussed by Member States cover different sectors and issues and as such may increase costs for companies operating across the EU.²⁵³

²⁵¹ Non-financial reporting [Text]. (n.d.). *European Commission - European Commission*. Retrieved August 13, 2019, from https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/non-financial-reporting_en.

²⁵² Strengthening corporate responsibility. (2019, July 23). *Global Witness*. Retrieved August 13, 2019, from <https://www.globalwitness.org/en-gb/campaigns/forests/strengthening-corporate-responsibility/>.

²⁵³ Business and Human Rights Resource Centre. (2019, May 22). National movements for mandatory human rights due diligence in European countries | Business & Human Rights Resource Centre. Retrieved August 13, 2019, from <https://www.business-humanrights.org/en/national-movements-for-mandatory-human-rights-due-diligence-in-european-countries>.

4.5.6.2. Renewable energy directive

The EU's revised Renewable Energy Directive (2018/2001/EU) establishes a binding renewable energy target of 32 percent by 2030. As part of the directive, new limits were set on the volume of high-risk Indirect Land use Change (ILUC) biofuels allowed to be counted towards renewable energy targets, ultimately reducing to zero by 2030. So far only palm oil has been classified as ILUC. This goal responds to continued concerns that biofuel production is associated with negative impacts from indirect land use change, namely that it displaces agricultural production into forests and wetlands. The directive also caps the use of food-based stocks, such as soy, towards the target at seven percent.

Concerns have been raised that under the directive's methodology soy is not classified as a high ILUC risk biofuel. Its share of expansion into high carbon stock areas of eight percent is below the threshold of ten percent for the period between 2008 and 2015. The exclusion of soy from the high ILUC risk list is controversial as it does not fully recognize the conversion of native vegetation in Cerrado from soy production or indirect land use change impacts from the displacement of other crops and cattle.²⁵⁴ Meanwhile, palm oil, which currently provides a much higher percentage of the EU's biofuels mix than soy, is classified as a high ILUC risk feedstock. This may change market trends by increasing the demand for low ILUC risk biofuels such as soy.

²⁵⁴ Biofuelwatch, & Global Forest Coalition. (n.d.). *High and low Indirect Land-Use Change (ILUC) - risks biofuels, bioliquids, and biomass fuels*. Retrieved August 13, 2019, from <http://biofuelwatch.org.uk/docs/ILUC-consultation-response.pdf>.

5. Recommendations

5.1 Overview

Based on a mapping of stakeholders and existing and candidate policies and instruments, we developed a series of recommendations on how governments can help to strengthen the sustainability of the soy supply chain. This chapter presents our main recommendations. [Table 10](#) provides an overview over these recommendations, dividing them into four categories: (1) recommendations on overarching stakeholder engagement and the development of action plans, (2) recommendations on regulatory measures, (3) recommendations on a mix of regulatory and non-regulatory measures to support private initiatives and (4) recommendations on softer non regulatory measures.

Table 10 Summary of policy recommendations

1. Strategic stakeholder dialogue and action plans	
Demand side measures	Production side support
Ensure a strong implementation of the EU Communication on “Stepping up EU Action to Protect and Restore the World’s Forests.”	Engage stakeholders of other soy producing regions
<ul style="list-style-type: none"> Assist the EU Commission in the evaluation of regulatory and non-regulatory measures to implement the EU Communication. Adopt domestic plans and measures to eliminate the import of embedded deforestation. 	<ul style="list-style-type: none"> Support the participation and engagement of stakeholders from other countries producing soy (e.g. Paraguay, Bolivia).
Increase visibility of soy sustainability concerns in international fora	
<ul style="list-style-type: none"> Support China’s efforts to make the Convention on Biological Diversity COP at Kunming in 2020 a success. Coordinate with China efforts to increase visibility of efforts to increase soy sustainability in other international fora. 	
Align criteria for sustainable sourcing guidelines	
<ul style="list-style-type: none"> Host dialogues between EU feed associations (such as the European Feed manufacturers’ Federation) and Chinese feed traders and purchasers to share their experiences and lessons learned in making the soy supply chain more sustainable. Disseminate tools for tracking and tracing soy supply chains with Chinese partners, among others to enable the operationalization of the China Responsible Soy Sourcing Guidelines. Engage with Chinese partners in the Soft Commodities Forum, Tropical Forest Alliance and the Cerrado Working Group. 	

2. Regulatory measures		
Demand side measures		Production side support
Ensure the inclusion of strong soy-related targets in trade agreements.		
<ul style="list-style-type: none"> Consider including soy sustainability-related provisions in international and regional trade agreements. 		
Adopt mandatory due diligence requirements.	Formulate standards for company reporting on soy impacts.	Strengthen the national authority in charge of managing the Forest Evaluation System (UMSEF)
<ul style="list-style-type: none"> Mandate companies to conduct due diligence to assess, prevent and mitigate their environmental, social 	<ul style="list-style-type: none"> Strengthen the reporting and disclosure requirements of the existing Non-Financial Reporting Directive, based on 	<ul style="list-style-type: none"> Provide technical assistance to improve data quality, dissemination and coordination of Forest Evaluation System (UMSEF)

and governance risks and impacts of soy.	the OECD Guidelines for Multinational Enterprises which include SDG reporting.	
Review soy commodity classification under the EU biofuels directive.		Strengthen the capacities of INTA, the Argentinean public rural extension service agency
<ul style="list-style-type: none"> Support an EU-wide assessment on the direct and indirect soy-driven conversion of forests. Amend the renewable energy directive classification of soy as a low-risk for indirect land use change biofuel. 		<ul style="list-style-type: none"> Build on existing German cooperation programs and expand efforts to support sustainable agricultural practices in Argentine soy farming systems.

3. Regulatory and non-regulatory measures

Demand side measures	Production side support
Up-scale the demand for certified soy	Support jurisdictional approaches in soy-producing regions. (Brazil)
<ul style="list-style-type: none"> Promote voluntary commitments towards sustainable and zero-deforestation soy. Encourage German companies to assume sustainability commitments (following the Danish and Dutch examples). Support the promotion of Pro-Terra and other zero deforestation certification standards. Adopt public procurement procedures that demand soy to be certified (as deforestation free). 	<ul style="list-style-type: none"> Support financially the PCI implementation (e.g. through REM, & Green fund, TFA). Provide technical assistance in formulating land use plans and integrated policy approaches in other soy-producing regions.

4. Non-regulatory measures

Demand side measures	Production side support
Take measures to reduce meat consumption.	Invest in improving the transparency of soy imports.
<ul style="list-style-type: none"> Take measures to reduce meat consumption as part of climate and health policies. Provide incentives for reduced meat consumption through promoting plant-based foods in public-sector cafeterias, universities and schools. Reduce livestock stocking rates in Germany and Europe (as part of climate policies). 	<ul style="list-style-type: none"> Collect and make available data on direct and re-exports, including volumes (including certified soy), companies and likely associated environmental and social impacts.
	Support the Soy Working Group (Cerrado region)
	<ul style="list-style-type: none"> Support financially the mechanisms to channel funds towards farmers that go beyond the legal deforestation requirements.

5.2 Policy measures to improve production context

Developing integrated long-term pathways for agriculture, climate and health policy interventions can substantially contribute to transforming land-use systems and diets in soy exporting and importing countries.²⁵⁵ Such pathways are best designed in close collaboration with multiple stakeholders, including scientists and businesses, and based on robust empirical evidence. Corporations involved in the soy supply chain should aim to collaborate with the government to

²⁵⁵ Willett, W., Rockstrom, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., et al. (n.d.). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*.

link their CSR reporting and national strategies with said long-term pathway planning.

5.2.1 Brazil

Support jurisdictional approaches in soy-producing regions. Jurisdictional approaches provide an effective opportunity to integrate environmental and social concerns into integrated land use strategies. Various soy-producing regions, such as Mato Grosso's Produce, Conserve, Include strategy, are actively pursuing similar strategies. PCI, for instance, strengthens policy and regulatory frameworks with an aim to promote sustainable and environmental- and climate-friendly land-use planning. A range of projects, programs and public-private partnerships are being established since 2019, as a result of a set of ambitious strategic goals established in the previous three years. For instance, assistance could build on existing programs such as Germany's REM Early Movers program, the Norway-sponsored & Green fund,²⁵⁶ TFA, and the IDH Sustainable Trade Initiative funded by other EU countries (and which is piloting the Verified Sourcing Area approach in Mato Grosso). Specifically, technical assistance could be helpful in the development of the often complex and lengthy multi-stakeholder engagement process necessary in jurisdictional approaches in other soy producing areas such as MATOPIBA. Moreover, financial assistance could be helpful in the implementation of monitoring and support systems, which are considered costly and therefore often lacking.

Support the Soy Manifesto and the Soy Working. Germany could foster the emerging financial mechanism that would channel funds towards farmers that go beyond the legal deforestation requirements. This effort could be integrated or complemented by measures to strengthen or improve the current green credit mechanisms mentioned in section 4.2.2.4. For instance, the Low Carbon Agriculture Plan launched in 2010 and which has since provided loans with preferential conditions for sustainable agricultural production in a total area of 27 million hectares could serve to incentivize low carbon soy agricultural practices in the Cerrado region.²⁵⁷ Another example is the recent TNC/Bunge/Santander financial mechanism with a USD 50 million fund to support farmers going beyond the legal requirements which once is functioning might need support to be improved and scaled-up.

This type of approaches can be very effective and generate quick results as the Soy Amazon moratorium has shown. Nevertheless, they tend to fail to address deforestation issues in a comprehensive and lasting way. Their success depends to an important extent on public law enforcement and the capacity of soy producers to bear the costs. As mentioned in section 4.5.4.2, the EU Commission already supports the strengthening of the Brazilian Agricultural Research Corporation (EMBRAPA in Portuguese) capacities, through the "Forest Management and Restoration in Productive Environments" project. It is specifically relevant to mainstream and upscale the adoption of sustainable soy production practices.

²⁵⁶ <http://www.andgreen.fund>

²⁵⁷ Michael Cordonnier. (2018, December). Brazil continues to emphasize Low Carbon Sustainable Agriculture. *Soybean & Corn Advisor: Your source for global soybeans and corn news*. Retrieved from http://www.soybeansandcorn.com/news/Dec20_18-Brazil-Continues-to-Emphasize-Low-Carbon-Sustainable-Agriculture.

5.2.2 Argentina

Strengthen the national authority in charge of managing the Forest Evaluation System (UMSEF). To enhance law enforcement in Argentina it is necessary to improve the coordination among public authorities that are in charge of the enforcement of the Forest Law. In addition, as private and civil society transparency initiatives are developed, it is important to establish the link between the information they generate and information provided by UMSEF. It would improve the reliability of deforestation data and allow to have a better understanding of the drivers of deforestation and impact of private companies' commitments. The EU could establish a cooperation between the European Forestry Institute with national forest agencies, and Germany could extend support for supply-chain traceability to Argentina.

Strengthen the capacities of INTA, the Argentinean public rural extension service agency. The EU Commission, collaborating with the GIZ, is already supporting INTA with its projects "Forest Management and Restoration in Productive Environments" and "Participatory Environmental Governance: Integrating the Challenges of Climate Change in the Great American Chaco" described in section 4.5.4.2. It is important to further mainstream and upscale the adoption of land use and sustainable farming practices in Argentina.

5.3 Demand-side measures

The EU Communication on Stepping up EU Action to Protect and Restore the World's Forests provides a starting point for action. It provides a mandate to assess additional demand-side regulatory and non-regulatory measures to ensure a levelled playing field and a common understanding of deforestation-free supply chains. The goal is to increase supply chain transparency and minimize the risk of deforestation and forest degradation associated with commodity imports in the EU.

Increasing the demand for sustainable soy and sharing the costs of addressing soy supply chain spill-over effects is fundamental. In addressing spill-over effects in supply chains, the costs need to be shared down the supply chain and not be absorbed by producer. To do so, market and non-market-based mechanisms can be developed or strengthened. In particular, soy farmers already making efforts beyond the legal requirements and certifying their production through RTRS and Proterra would benefit from an increased demand for certified soy. Currently, a substantial share of certified soy does not find buyers and the existing premiums do not generate enough incentive.

The most effective way to limit negative spill-over effects from soy production is to limit meat consumption. If consumption trends continue as projected, the world will need to increase food production by more than 50 percent and increase crop and pasture land by nearly 600 million hectares by 2050.²⁵⁸ Currently, livestock uses two thirds of agricultural land, but it only supplies about a third of our calories. Meat is responsible for about 15 percent of global GHG

²⁵⁸ Searchinger, T., Waite, R., Hanson, C., Ranganathan, J., Dumas, P., & Matthews, E. (2018). *Creating a Sustainable Food Future. A Menu of Solutions to Feed Nearly 10 Billion People by 2050*. Retrieved August 13, 2019, from <https://www.undp.org/content/dam/undp/library/Sustainable%20Development/Creating-a-sustainable-food-future.pdf>.

emissions and about two thirds of agricultural emissions. Considering that the vast majority of soy is used for feed, a reduction of meat consumption, in particular chicken and pig meat, would ease the land pressures coming with soy production.

5.3.1 Regulatory measures

Ensure a strong implementation EU Communication on Stepping up EU Action to Protect and Restore the World's Forests. It is essential to support the EU Commission in evaluation measures to eliminate the import of embedded deforestation into the EU. Germany could follow France in advancing an ambitious strategy to remove deforestation from imports; this would fall under the EU Communication's recommendation to coordinate supply and demand side actions to counter imported deforestation. This would not only apply to soy, but could be aligned in a systematic manner to other commodities, such as cocoa, beef and palm oil.

Adopt mandatory due diligence requirements for EU companies operating in the soy supply chain. Due diligence requirements could mandate companies operating in the EU to conduct due diligence to assess, prevent and mitigate their environmental, social and governance risks and impacts. The German Government can support this by promoting due diligence requirements at the EU level for all agricultural commodities. Nevertheless, agricultural commodities which generate a bigger risk for forests or other sustainability issues, such as soy should be prioritized. Funding or conducting feasibility studies could support progress on this. Existing due diligence instruments, including the EU Timber Regulation, the FLEGT Action and the Sustainable Investment Disclosure (the later requires institutional investors to disclose how they integrate environmental, social and governance factors in their decision), could serve as models for corporate due diligence rules and improving transparency and traceability of products. Efforts are currently underway to assess the feasibility of replicating these measures in other commodities that drive deforestation, such as in the case of cacao in West Africa. Mandatory due diligence requirements could prove efficient at setting a minimum sustainability requirement. The EU should support the development of such analysis, as well as show leadership. Primarily, this is because the private sector has strong reserves against such measures, as they have the potential to create more responsibilities to adopt and enforce them.

Classify soy as a high-risk commodity driving land use change under the EU biofuels directive. The EU could demand an EU-wide assessment on the direct and indirect soy-driven conversion of forests; revealing the spill-over effects could inform a review of the renewable energy directive classification of soy as a low-risk for indirect land use change biofuel. This review could also consider the impact of the revised renewable energy directive on demand for imported soy for use in biofuels and if the threshold for defining ILUC feedstocks should be revised. Such action could be embedded in a review of the Commission Delegated Regulation (EU) 2019/807 in 2021 and, if appropriate, a revised Delegated Regulation (EU) 2019/807 in 2023.

Early adopters of soy sustainable certification should be prioritized in order to reward their early engagement. Farmers who adopted sustainability standards and are not receiving the premium expected, or are not able to sell their certified soy, may create backlashes against further efforts to certify soy. This is especially important, since the market of certified soy has potential to grow, but is more likely to stay a market niche. A major uptake of certified soy depends to an important extent on the rise of sustainable feed and livestock products that can absorb premium costs or translate it to the final consumers. In addition, as financial mechanisms to compensate farmers for not legally converting native vegetation are being developed in areas with soy deforestation risks, the EU or GIZ could support the design and implementation of such mechanisms. Notably, it could support the capitalization process of the fund that would accompany such financial mechanism.

Formulate standards for company reporting on soy impacts. EU can strengthen the reporting and disclosure requirements of the existing Non-Financial Reporting Directive, based on the OECD Guidelines for Multinational Enterprises. Existing reporting and disclosure initiatives, such as CDP, which focuses on deforestation, the Global Reporting Initiative, as well as the Global Compact (see section 4.1.1), can support companies to improve the quality of their reporting on risks as mentioned in section 5.3. The recent EU Communication on Forests²⁵⁹ announced in July 2019 recommends that the Commission continues ongoing work to assess the need for companies to develop and disclose sustainability strategies including due diligence. This is a positive signal towards an EU wide mandatory due diligence requirement on deforestation risks.

5.3.2 Non-regulatory measures

Provide incentives for reduced meat consumption. Governments (federal, state and municipal) can provide incentives for reduced meat consumption through promoting plant-based foods in public-sector cafeterias, universities and schools. Reduced meat consumption should also be part of climate and health policies. Livestock stocking and production rates in Germany and the EU could also be reduced as part of an effective climate and health policy.

The EU could help to enhance demand for certified soy. Engage companies operating in Germany (and/or EU) to adopt and implement commitments to source more sustainable soy. While several retailers have shown leadership with such commitments (e.g. in the context of the Forum sustainable protein feed), data indicates significant number of influential companies operating in Germany have not. The German government could follow similar models used by UK and Dutch roundtables on soy, by bringing together companies across the supply chain (from retailers, manufacturers, and traders) to commit to more sustainable sourcing, define implementation plans and report on progress. This measure would also increase demand for sustainable soy as well as and lend some credibility to the support provided by the EU to soy production in producer countries. The EU already collaborates with ProTerra on a few platforms, such as the Collaborative Soy Initiative.

²⁵⁹ European Commission. (2019, July 23).

The public procurement of certified soy and the requirement of publicly procured products to be deforestation-free could provide a strong signal of commitment. There are several examples across Europe of local municipalities including eco-friendly criteria to guarantee that a minimum share of products complies with some eco-friendly standard. Current experiences are mostly related to organic food certifications in schools. Replicating these local examples across major metropolitan areas or through city coalitions engaged to fight climate change and deforestation can be a way to slowly ensure a sustainable increase in certified soy demand. This would align with the new voluntary EU Green Public Procurement for food, catering services and vending machines released in October 2019.²⁶⁰

Invest in improving the transparency of soy imports. Particularly, the availability of data on direct and re-exports, including volumes (including certified soy), companies and likely associated environmental and social risks, could be improved. This information would enable Germany and other EU countries to monitor spill-over effects over time, assess effectiveness of interventions to reduce risks, and support companies buying soy in Germany to undertake due diligence. Moreover, this needs to go beyond deforestation-free certified soy which accounts for less than 13 percent of EU imports²⁶¹ – investment is needed to build on existing tools and approaches such as life cycle analyses to create relevant data. This could build on similar efforts by France (deforestation-free import strategy) and the UK (25-year environment plan), as well as the EU Observatory outlined in EU Communication on Forests and the SDG reporting progress presented in section 5.3.

Ensure the inclusion of strong soy-related targets in trade agreements. New EU trade agreements such as the Mercosur Agreement with the EU should contain strong sustainability provisions. The Mercosur Agreement in its current form provides a basis to ensure that environmental and social regulations associated with soy value chains are not weakened. It also encourages further engagement with buying companies on removing deforestation from value chains.

5.3.3 Engaging China

Strengthen and expand the Amsterdam Declaration Partnership. The ADP could engage with non-members to discuss the environmental and social spill-over effects from soy imports, as well as motivate them to support the Partnership. This would only be possible if the ADP is extended. Engage Chinese soy supply chain actors in a lasting and effective way would also be important. Previous experience of organizing the 2017 RTRS annual event in China has shown that more effort is necessary to guarantee the long-term and effective engagement of Chinese actors. In particular, support to overcome language barriers at major global events such as ADP, RTRS annual event and others would offer the possibility for Chinese actors to participate more actively.

²⁶⁰ European Commission. (2019a). *EU green public procurement criteria for food, catering services and vending machines* (Commission Staff Working Document) [Commission Staff Working Document]. Retrieved from [https://ec.europa.eu/environment/gpp/pdf/190927_EU_GPP_criteria_for_food_and_catering_services_SWD_\(2019\)_366_final.pdf](https://ec.europa.eu/environment/gpp/pdf/190927_EU_GPP_criteria_for_food_and_catering_services_SWD_(2019)_366_final.pdf).

²⁶¹ IDH, & IUCN National Committee of the Netherlands. (2019).

Hosting stakeholder dialogues between EU feed associations and companies with Chinese associations on responsible soy sourcing. This could be done via existing platforms such as national roundtables, the Amsterdam Declaration Partnership, TFA, or the Sustainable Soy Trade Platform. Examples of lessons learned from EU companies working on this topic that could be shared with Chinese stakeholders include: how to effectively engage multiple stakeholders along the supply chain, and how to ensure tracking and traceability and work with the Brazil and Argentina's public sectors. This could include providing technical support to ensure alignment of FEFAC sourcing guidelines with sustainable soy objectives.

Share tools for tracking and tracing soy supply chains. EU actors could support Chinese state-owned companies in the implementation of their soy policy and China Responsible Soy Sourcing Guidelines (CRSSG). The SSTP's China Soy Roadshow – organized to raise awareness among China's soy and livestock industries about deforestation risks – reported that stakeholders were “very receptive to the potential of these [tracking] tools”.²⁶² Companies are especially interested in tools that enable them to better understand risks and plan sustainable sourcing strategies. State-owned companies will follow Chinese national policy and narratives around sustainability in supply chains. This means any engagement from EU stakeholders with state-owned companies, such as COFCO, should be sensitive to the need for China to feel in the driving seat in collaborative efforts. That said, there is promising options for engagement with COFCO: supporting the Soft Commodities Forum (SCF), TFA, and the Cerrado Working group are key entry points. In particular, the EU could share lessons learned from adopting traceability tools for their own supply chains, and even provide technical assistance for their adoption through the SCF.²⁶³

Increase visibility of soy sustainability concerns in international fora. EU actors could cooperate with China to raise sustainability concerns of soy in the context of the Convention on Biological Diversity (CBD) COP in China in 2020. Such efforts could be aligned with the measures proposed in the recent EU Communication on Forests, which includes supporting soy-related considerations in the FAO, G7/G20, UN Framework Convention on Climate Change (UNFCCC), UN Forum on Forests (UNFF), United Nations Convention to Combat Desertification (UNCCD), UN Environment Assembly (UNEA), Organization for Economic Co-operation and Development (OECD) and World Trade Organization (WTO). This is to be done by promoting best practices and a common understanding of sustainable supply chains, and advocating for the adoption and implementation of strong commitments and provisions.²⁶⁴

5.4 SDG reporting

There are also several actions the EU and Germany can take to improve SDG reporting and ensure an appropriate reflection of spill-over effects in SDG reporting.

²⁶² Trase. (2019, May 8). Prioritising sustainability in China's soy supply chain. *Medium*. Retrieved July 31, 2019, from <https://medium.com/trase/prioritising-sustainability-in-chinas-soy-supply-chain-46f3357020f5>.

²⁶³ Soft Commodities Forum. (n.d.). *World Business Council for Sustainable Development (WBCSD)*. Retrieved July 30, 2019, from <https://www.wbcd.org/Programs/Food-Land-Water/Food-Land-Use/Soft-Commodities-Forum>.

²⁶⁴ European Commission. (2019, July 23).

Assess statements, targets and monitoring indicators presented in CSR reports of companies to ensure their alignment with the SDGs and international fiscal standards. In this context, it is important to support initiatives by civil society or multi-stakeholder platforms that carry out independent assessments. Corporate sustainability rating tools used by the financial sector should be adapted to systematically capture the sustainability of the end-product/service, the internal processes, the supply chain (i.e. intermediate suppliers) and companies' compliance with their fiscal obligations. In turn, these rating tools could help inform sustainable investment decisions more accurately.

Incentivize companies to take actions and accurately report their SDG contributions. EU actors can support the implementation of upcoming sustainable disclosure regulations and build capacity to improve companies reporting. Investors could engage in environment, social and governance (ESG) investing, and they could account for shareholder engagement through holding companies. They could also divest from companies that do not pass ESG-filters. Concerning SDG reporting, companies could ensure that they capture the following aspects of their sustainability achievements and commitments to the goals:

- Evaluate the final product or service (is it good or bad for the SDGs)
- Evaluate internal processes (i.e. infrastructure, HR etc.)
- Evaluate the sustainability of companies' supply chains (i.e. intermediate suppliers)
- Assess whether companies are paying taxes. This is covered under SDG16.4²⁶⁵ and SDG17.1.²⁶⁶

Evaluating these four elements is key to align business ratings to the SDG context and inform sustainable investments in the soy- and supply chains. The fourth element is particularly important and relevant in the context of the soybean supply chain, considering past tax evasion charges against soybean multinationals.^{267 268}

Integrate consumption-based measures in official SDG monitoring instruments, including VNRs and other official reports. Such integration could be an incentive and provide inputs for future policy developments. Currently, consumption-based measures tend to fall outside of official statistics. Moreover, official monitoring reports do not always track environmental and socio-economic effects embedded in trade, including in the EU. Aggregate measures would already help inform the policy debate, given that this integration of consumption-based measures could be challenging from a technical standpoint in the case of the soy supply chain. This is because of the current limits of consumption-based approaches and databases, as well as it being time-consuming. Further investments are needed in data infrastructure and for building capacities in monitoring international spill-over effects.

²⁶⁵ 16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime

²⁶⁶ 17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection

²⁶⁷ Harvey, F. (2018, August 13). Tax havens shielding companies responsible for deforestation and overfishing | Environment | The Guardian. Retrieved August 13, 2019, from <https://www.theguardian.com/environment/2018/aug/13/tax-havens-shielding-companies-deforestation-overfishing>.

²⁶⁸ Lawrence, F. (2011, June 1).

Help fill data and knowledge gaps in the tracking of policies and inputs related to the SDG Transformations. The Climate Action Tracker has done ground-breaking work in assessing the presence and adequacy of national GHG emission-reduction targets with the Paris Agreement; inventorying national policy instruments (policies, regulation, budgets, etc.) for energy decarbonization and determining their adequacy for meeting national targets (Transformation 3). In this way, the Climate Action Tracker has greatly enhanced our collective understanding of whether countries are on track towards the Paris commitments. It is an invaluable tool for international climate policy that should expand its limited coverage of G20 members and a few other countries. For instance, the initiative could be expanded to the other five Transformations – including Transformation 4 on “Sustainable Food, Land, Water, Ocean” - where the monitoring of progress draws primarily on outcome data. This, we believe, is one of the most urgent gaps to be filled by the international scientific community in the next few years.

Prevent deforestation leakages to other soy producing regions. Currently, the global attention is on eliminating soy-driven deforestation from specific biomes. However, as some measures focusing on those specific biomes provide positive results, they may have the unintended effect of increasing pressure to expand soy production in other regions and thereby generate deforestation leakages. Therefore, it is quintessential to bring together supply chain stakeholders of other regions where soy production is expanding, as soon as possible. In Paraguay, soy production has increased by 10.6 percent in the past five years.²⁶⁹

²⁶⁹ Data & Analysis | USDA Foreign Agricultural Service. (n.d.). Retrieved March 15, 2019, from <https://www.fas.usda.gov/data>.

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7. Annex

7.1 Technical approach and methods

This study is based on (i) a mapping of stakeholders; (ii) the development of a guiding analytical framework; (iii) a desk review of existing literature as well existing data; and (iv) stakeholder interviews.

Our analysis started with the identification of relevant stakeholders in all prioritized jurisdiction. We further analyzed their role in the soy supply chain and their impact on its sustainability. The findings of the stakeholder analysis allowed us to define the scope of the study, in particular the policy instruments that we decided to analyze and the actors of the soy supply chain associated to them.

In parallel, we developed an analytical framework that delimits the elements considered during our comparative analysis of policy instrument. The analytical framework summarized the international and national governance of a sustainable supply chain. The analysis included an assessment of the existing governance (institutions, actors, policies, initiatives) in producing and consuming countries. It also allowed us to identify the SDG targets identified as most relevant for achieving soy supply chain sustainability.

We then conducted a comprehensive desk review based on relevant academic literature, official reports, company and civil society reports as well as company websites. This review gathered information on the functioning and performance of the policy instruments considered in this analysis. It also allowed getting a better sense of the context under which they were adopted and are functioning. We also relied on information from the Trase supply chain platform, which provides updated estimates of the deforestation embedded in the soy supply chain of Argentina, Brazil and their importers, notably EU and China. Trase includes information regarding the subnational origin of soy production, the volumes traded, the deforestation associated to it and the major traders.

We complemented our analysis with consultations of key stakeholders from the major stages of the soy supply chain in the EU, China, Brazil and Argentina. We interviewed direct supply chain actors (e.g. traders, farmers associations, retailers), relevant experts (e.g. certifying bodies, research centers, NGOs) and public actors regulating aspects of the supply chain (e.g. subnational public institution, supra national public institution). For the consultations, a semi-structured questionnaire was prepared and applied to 5 companies, 5 supply chain actors' associations, 4 public actors, 7 civil society organizations leading initiatives to make the soy supply chain more sustainable.

In addition, we conducted interviews with international experts to complement the information on the policy instruments, the specificities of the soy supply chain and their actor as well as to corroborate preliminary findings.

7.2 Methods for measuring trade-related international spill-overs focusing on one specific supply chain

This section discusses the pros and cons of two methods that can be used to measure more specifically and empirically the socio-environmental impacts generated by specific value chains (e.g., soy), and their association with imports (e.g., of China and Europe) and exports (e.g., from soy producers such as Argentina or Brazil). Namely:

- 1) Hybrid Material-Flow Analyses (MFA) & Life Cycle Assessments (LCAs)²⁷⁰
- 2) Multi-Regional Input-Output (MRIO) analyses

MFA tracks flows of materials in a system, whereas LCAs tracks the impacts of a product's "life" stages. Therefore, by combining the two approaches one could estimate bilateral impacts associated with trade flows focusing on one specific commodity (such as soy).

MFA uses empirical data on production and trade. The MFA concept is increasingly being incorporated in national accounts including in the European Union. MFA can track flows to importing countries, but a hybrid method is needed to link those imports with final consumers and socio-environmental impacts.

LCA uses a bottom-up approach to assess the socio-environmental impacts of individual products by examining their production processes (which may take place across geographic and temporal scales). For instance, Milazzo and colleagues (2013) reviewed the performance and prospects of soy biodiesel production on a global basis through some 30 LCAs.²⁷¹ The principal advantages of LCAs are their ability to tailor the study to a specific product and value chain, their increasing application not only to environmental impacts but also socio-economic impacts, and that they allow to consider different production technologies.

Conversely, this approach has three major limitations. Firstly, it requires extensive conceptualization of the flows and impacts that can be attributed to a country when focusing on a specific supply chain. LCA methods are generally time-consuming and the outcomes tend to be very specific, therefore limiting their ability to inform alternative supply chains or sourcing decisions.²⁷² (Bruckner *et al.*, 2015). Secondly, the analytical scope of the LCA method is limited by the system boundary or cut-off, the so-called "truncation problem"²⁷³, (Reap *et al.*, 2008), which needs to be defined for any product. Thirdly, it requires vast volumes of data, which may be unavailable, particularly where information is commercially sensitive. To

²⁷⁰ LCA could also be considered as a separate method in itself. As discussed at the end of the section, LCA can also be combined with MRIO. Yet, for simplicity, we decided to break down the main approaches to track consumption-based impacts for specific supply chains into two "broad categories" grouping together MFA and LCA.

²⁷¹ M.F. Milazzo, F. Spina, S. Cavallaro, & J.C.J. Bart. (2013). Sustainable soy biodiesel. *Renewable and Sustainable Energy Reviews*, 27. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1364032113004760?via%3Dihub>.

²⁷² Bruckner, M., Fischer, G., Tramberend, S., & Giljum, S. (2015). Measuring telecouplings in the global land system: A review and comparative evaluation of land footprint accounting methods. *Ecological Economics*, 114(C), 11–21.

²⁷³ Reap, J., Roman, F., Duncan, S., & Bras, B. (2008). A survey of unresolved problems in Life Cycle Assessment - Part 2: impact assessment and interpretation. *The International Journal of Life Cycle Assessment*, 13, 374–388.

overcome this issue, LCA practitioners rely on comprehensive LCI (life cycle inventory) databases such as the ecoinvent and GaBi.

On the other hand, Multi-Regional Input-Output (MRIO) analyses combine internationally harmonized input-output (IO) tables and trade statistics for industry sectors or groups of products and services. IO tables can include accounts with information on resources, emissions, and other production-related data, so as to allow for “extended” MRIO models that can quantify trade-related environmental, socio-economic, security, and/or governance/finance spill-overs. MRIO analyses attribute socio-environmental impacts to products/services and final consumers based on monetary transactions, whereas MFA/LCAs track impacts from a mass perspective (kg, m³, etc.). MRIO analyses are top-down methods that offer a comprehensive global coverage of a full supply chain. In turn, they operate at higher levels of aggregation, generally measuring average impacts and not distinguishing between factory-specific technologies, efficiencies, and intensities of resource use and pollution. As a result, MRIO methods are best suited for assessing aggregate spill-over effects at the industry sector level or for products/services groups and consumption bundles. Results can be presented for individual countries (as final consumers). A major advantage is the relative ease with which analyses can be conducted and represented for different countries once the MRIO tables have been set up.

There are various MRIO databases that can be used to track spill-over effects of supply chains. Table 11 summarizes some of the pros and cons of five major MRIO databases in the context of supply chain specific analysis (e.g., soy).

Table 11 Main characteristics of five MRIO databases

Database	Eora26	Full-Eora	EXIOBase3	WIOD	GTAP
Website	<i>worldmrio.com</i>	<i>worldmrio.com</i>	<i>www.exiobase.eu</i>	<i>wiod.org</i>	<i>gtap.agecon.purdue.edu</i>
Sectors	Standardized	Country-specific	Standardized	Standardized	Standardized
-Number of sectors	26	<i>Not applicable</i>	200	56	65
Country coverage	190	190	44 + 5 ROW	43 + ROW	121
Years	1990-2015	1990-2015	1995-2011	2000-2014	2004-2014
MRIO Model Certainty	Poor	Good	Good	Good	Good
Environmental extension	Good	Good	Good	Good	Poor

Source: Authors

Most databases include standardized sectors with the exception of the Full-Eora which includes country-specific sectors. Typically, these standardized sectors do not necessarily include a “soy” sector, as it may be included under a larger aggregate sector (such as “oil seeds” in the case of Exiobase). The number of sectors varies from 26 in Eora26 to 200 in ExioBase3. The aggregation or disaggregation into common sectors involves a logical classification made by the database managers. In the case of Full-Eora, sectors are country specific based on the Systems of National Accounts. This means, for instance, that the sectors of the

Argentine IO table are different from the sectors of the Brazilian IO table. Thus, the sector resolution varies across countries, with some exceeding 200 sectors (higher economic disaggregation). For example, in the Brazilian IO table there is more detail on soy industries and commodities whereas in the Argentine table soy is included within a broader category (“oil seeds and oleaginous fruits”) (Table 12). Hence, it might be more precise to estimate spill-over effects related to the soy supply chain for Brazil than for Argentina. The country-specific sector disaggregation may also make accurate cross-country comparisons more challenging.

Table 12 Soy commodities included in the Full-Eora database for selected countries

Item index (#)	Country	Entity	Sector
Argentina			
285	Argentina	Commodities	Oil seeds and oleaginous fruits
Brazil			
1910	Brazil	Commodities	Soy grain
1934	Brazil	Commodities	Oil, cakes, rind, flour and other raw soy products
1936	Brazil	Commodities	Processed soy oil
Paraguay			
8926	Paraguay	Commodities	soybean
USA			
13683	USA	Commodities	Soybean and other oilseed processing

Source: Authors

Country coverage also varies extensively across databases. Eora26 and Full-Eora include the largest number of countries (190) but this implies extensive modelling to cover data gaps. By contrast, Exiobase, WIOD and GTAP include fewer countries and, consequently, a larger “Rest of the World” (ROW) aggregation, but may have more accurate data points. In Exiobase, for instance, Argentina is included in the ROW category, which makes it impossible to isolate spill-over effects affecting Argentina specifically.

Difficulties in reporting data in a timely way and the lack of comparable assessments over time are also important limitations for informing accurately policy debates. At best, the data has a lag of four years compared to the current year. This means that at the moment, data is typically available for 2014 or 2015. In the case of Exiobase, the latest data available is from 2011. It is also rather difficult to track progress over time due to changes in sector classifications, data availability, and other methodological issues. Also, many assessments are one-off exercises

that seek to demonstrate a new methodological approach, or explore a specific case study, so that continuous time series data is not systematically available.

The robustness of the modelling approaches and documentation provided can also vary across databases. For instance, the Eora26 website mentions that “this simplified model is considerably easier to work with than the Full-Eora MRIO, but it is known to be slightly less accurate. Both the step of aggregating sectors from the higher sectoral detail of Eora to the lower detail of Eora26, and the step of converting Supply-Use IO tables into product-by-product IO tables, involve a net information loss and the introduction of some new assumptions.²⁷⁴ Full-Eora is considered to be superior to Eora26 when it comes to accuracy and modelling approaches. Comparisons of modelling approaches in MRIO analyses are relatively well documented.²⁷⁵

Finally, the availability of socio-environmental extensions can also vary quite significantly. Depending on resources and capacities, socio-environmental extensions can be integrated into all these databases. Currently, GTAP is the database with fewer extensions available, which means that fewer impacts embedded in trade of the soy value chain can be tracked with this database. Ultimately, while data on economic transactions is based on national statistics (quite robust) the reliability of the socio-environmental extensions depends on the quality of data collected and reported by other organizations (including international governmental and non-governmental organizations). Industry sectors in the IO tables of MRIO models may not match the sector disaggregation of socio-economic and environmental databases used as extensions, and hence may need some adjustments.

An ongoing project, led by the SDSN Andes (regional network of the SDSN), ISA Group (University of Sydney) and FOFO-INPADE (Argentine NGO), in collaboration with other partner organizations, is currently using the Full-Eora MRIO model to track socio-economic and environmental spill-overs linked to the Argentine soy value chain. To do this, the sector resolution of the Argentine IO table in the MRIO model is being improved, to include specific soy-industry sectors, and then the model is being extended with data on socio-environmental impacts of the soy-industry. This exercise will describe impacts in Argentina that are associated with foreign consumption (e.g., of China and Europe); thus being an example of how this methodological approach can be used to assess soy-related spill-over effects.

7.3 Policy instrument impact on SDGs

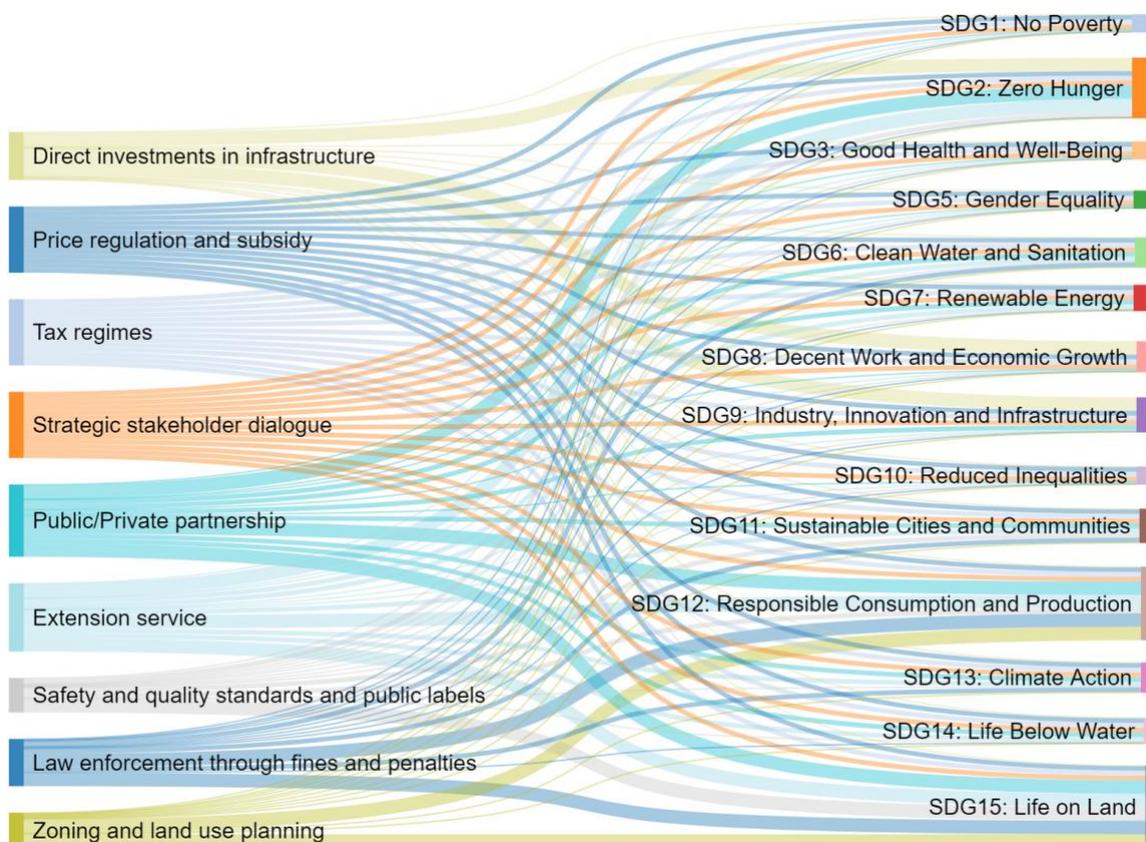
The policy instruments toolbox available to enhance the soy supply chain sustainability is presented below in the Analytical framework. In the following Sankey flow charts, we are looking at the linkages between the various policy instruments and the SDGs impacted. A 3-point scale was used – indirect impact, moderate impact and direct impact. The policy instruments have been clustered by

²⁷⁴ Eora Global MRIO. (2019).

²⁷⁵ Owen, A., Steen-Olsen, K., Barrett, J., Wiedmann, T., & Lenzen, M. (2014). A Structural Decomposition Approach to Comparing Mrio Databases. *Economic Systems Research*, 26(3), 262–283.

types of actors (public actors supply side [Figure 12](#), public actors demand side [Figure 13](#), private actors [Figure 14](#), enabling actors [Figure 15](#)). This is an attempt based on the authors' judgement. A detailed excel dataset that provides more information on how these Sankey Diagrams²⁷⁶ were constructed is available online.

Figure 12 Public actor policy instruments SDG impact– supply side



²⁷⁶ As a small clarification the color scheme used for the different policy instruments only serves the purpose to be able to visually distinguish easily the links of the different policy instruments.

Figure 13 Public actor policy instruments SDG impact - Demand side

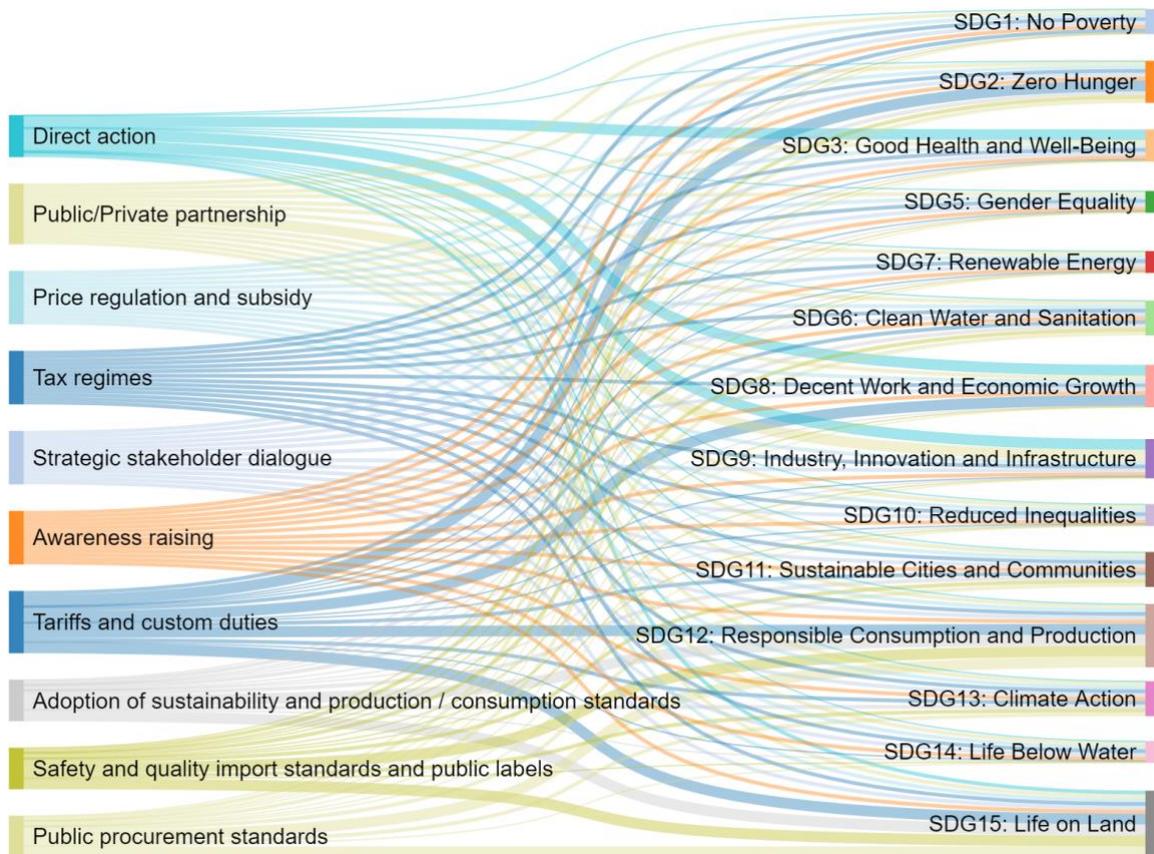


Figure 14 Private actors policy instrument SDG impact - Supply and Demand side

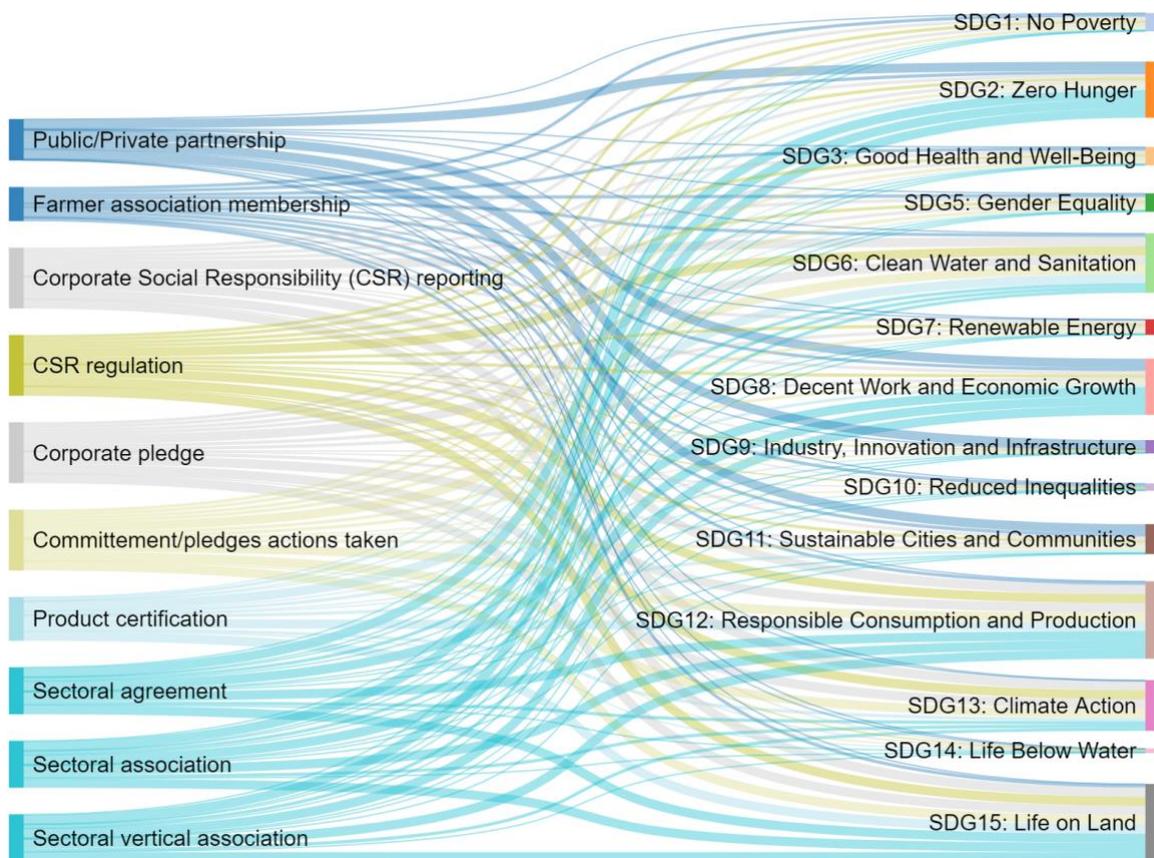
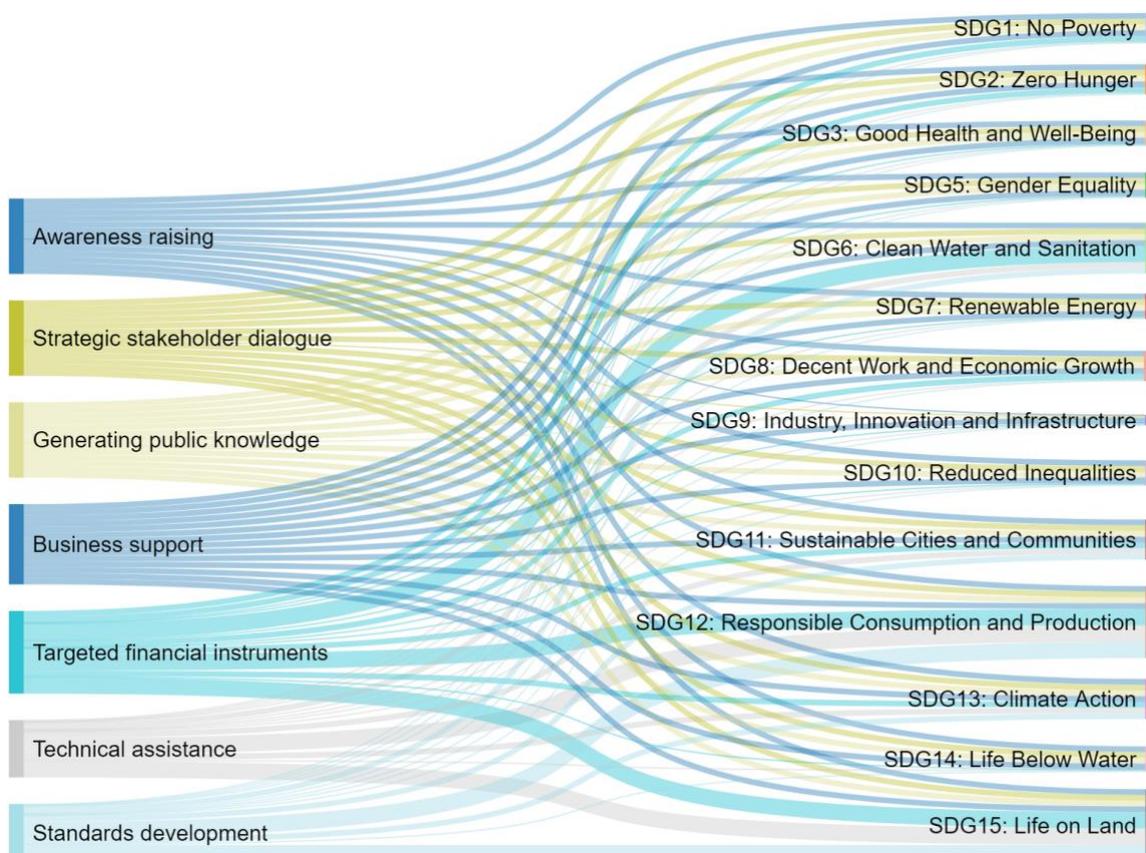


Figure 15 Enabling actors policy instrument SDG impact

7.4 Stakeholder Analysis additional finding

Soybean supply chain stages and products

In addition to the findings of the stakeholder analysis which were integrated in the main part of this study below are presented additional findings to complement the understanding of the global soy supply chain and its stakeholders.

The soybean supply chain broadly consists of three stages: soybean production, soybean main processing, and soybean products secondary processing. In addition to these stages, there are two important processes that play an important role during all stages of the supply chain:

- Transport: It involves all transportation of soybeans and soybean products to and from the different agricultural, industrial and retailing facilities involved in each of the stages described. It is particularly relevant in case of imports and exports.
- Storage: It involves the inventories of soybeans and soybean products at all stages of the soybean supply chain.

The first stage of the soybean supply chain is soybean production. It considers the activities undertaken to:

- Preparation: It involves the preparation for production activities, such as inputs provision (e.g. seeds, fertilizers, labor) and the preparation for enabling activities such as financial loans application and certification standards subscription.
- Production: It involves the production of soybeans including all the activities from ranging from land preparation, seeding, fertilization application, pest and disease control among others, up to the harvest.

In this stage there can be a degree of soybean imports to supply local domestic consumption. Furthermore, soybean and soybean product imports can occur at any stage of the supply chain to ensure that the supply meets processing capacities or demand. It is particularly associated with level of stocks, international prices and the soybean crop calendar. Exports of soybeans and soybeans products can also occur for any of the stages presented. Depending on the level of processing for soybean products, the next stages of the supply chain may be undertaken in the importing country or an intermediary country.

The second stage describes initial soybean processing. Although there can be several types of processing at different levels of the soybean production, the main processing stage is called crushing.

Crushing is the main industrial process performed to extract the soybean's vegetable oil and produce meal which is a source of high-protein feed. The technology used and other factors associated with the soybean grains (e.g. seed variety) will determine the efficiency of this process. Generally, an efficiency rate of 95% can be assumed as a minimum for producing countries. In other terms, from 1 tone of soybean, 95% is converted to vegetable oil and meal. The rest will be converted into soybean husk and other minor soybean products. The EU's efficiency rate is 98% (19% oil, 79% meal)²⁷⁷, and Brazil's is 96% (19% oil, 77% meal)²⁷⁸.

There are several steps and processes that can be undertaken at this stage, from cleaning, drying and sorting of soybeans to heating and pressing.²⁷⁹ The extraction process can be via filtration or solvent distillation for crude oil and via desolventing and toasting for meal extraction.

At this stage, as shown in [Figure 16](#) the main inputs both for future vegetable oil and feed products are generated. During later stages, it is then possible to divide the soybean supply chain by industry sector, specific to feed and vegetable oil production.

In parallel to the crushing process, toasting and fermenting are minor types of industrial processes present at this stage. They mostly generate food, but also feed products to a lesser extent.

²⁷⁷ USDA FAS. (2018a). *EU-28 - Oilseed and Products Update* (No. Au1804) (No. Au1804). Retrieved March 15, 2019, from <https://gain.fas.usda.gov/Pages/Default.aspx>.

²⁷⁸ USDA FAS. (2018a).

²⁷⁹ FEDIOL. (2019). Oilseeds crushing. *FEDIOL*. Retrieved March 15, 2019, from <https://www.fediol.eu/web/oilseeds%20crushing/1011306087/list1187970095/f1.html>.

The third stage of the soybean supply chain describes the second level of soybean processing. It generally consists of industrial processes during which:

- soybean products are refined (e.g. edible soybean vegetable oil),
- soybean products are mixed with other inputs to create other soybean products (e.g. biofuels).

At this stage, manufacturing activities play an important role along with accompanying retailing activities.

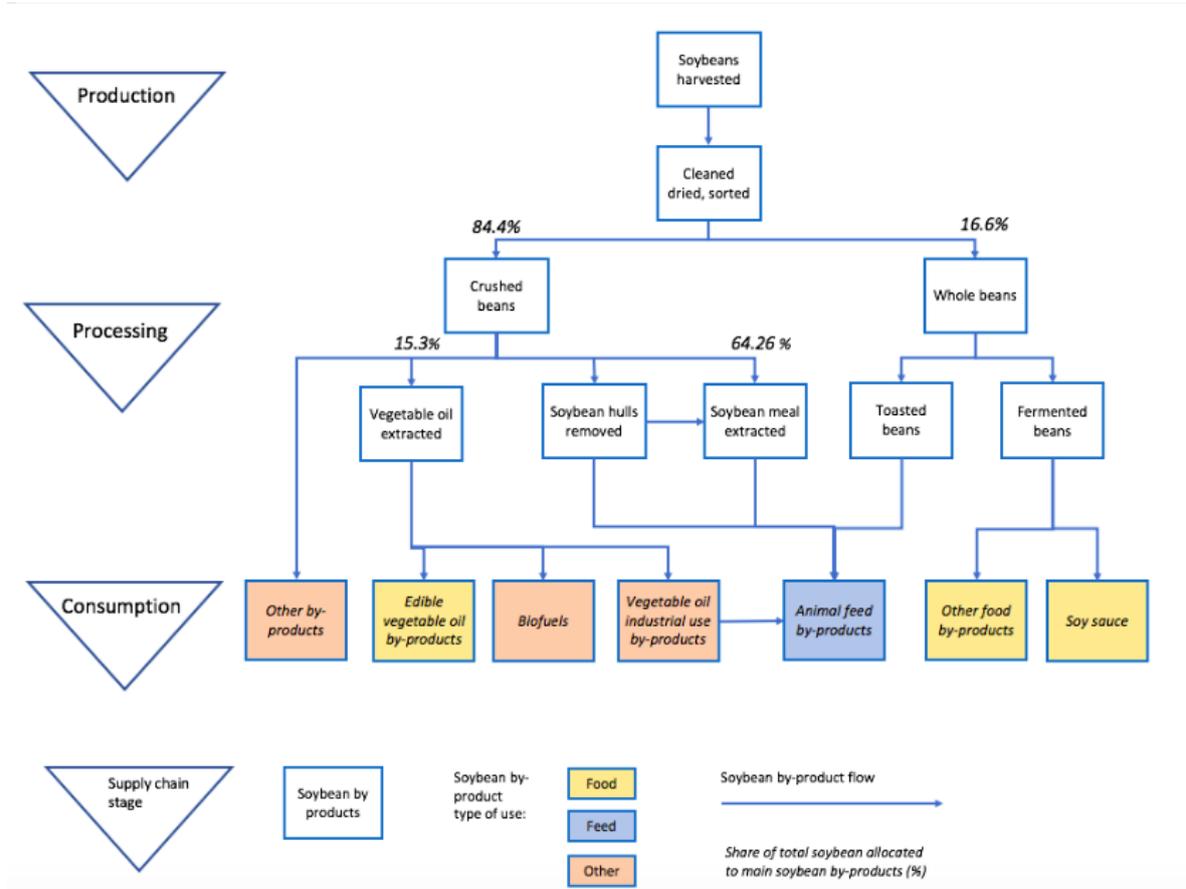
[Figure 16](#) below presents a flow chart summarizing the main soybean products and their respective use.

The importance of each of the soybean products depends on the soybean supply chain of each country. Feed products and in particular meal are by weight the most important soybean products.

At global level, the USDA estimated that in 2017 from the 340 million tons of soybean produced worldwide, 84.4% was crushed. Given the relatively higher extraction rate for meal than for the extraction rate of vegetable oil, feed use was the main world usage of soybeans and soybeans products by far. Overall 64.26% of the world soybeans was converted into feed meal and 15.3% into vegetable crude oil products.²⁸⁰ It is unclear what is the exact proportion of soybeans that goes into food use products and into other uses products. Other uses comprise all utilization that does not include food and feed, as for industry or for non-food human consumption.

²⁸⁰ USDA FAS. (2018b). *EU-28 - Oilseed and Products Update* (No. Au1804) (No. Au1804). Retrieved March 15, 2019, from <https://gain.fas.usda.gov/Pages/Default.aspx>.

Figure 16 Soybean main products and uses



Soybean supply chain stakeholders

A relatively small number of firms dominate important segments of the supply chain, upstream and downstream.²⁸¹

The following section presents actors and industry associations with important roles in the supply chain (Figure 17). These actors determine the standards, rules, procedures and other regulations that drive sustainability in the supply chain. In addition, there are other public, private, and civil society actors that are part of the institutional and business context and that are often directly or indirectly related to supply chain actors and the industry associations.

²⁸¹ Heron, T., Prado, P., & West, C. (2018). Global Value Chains and the Governance of 'Embedded' Food Commodities: The Case of Soy. *Global Policy*, 9, 29–37.

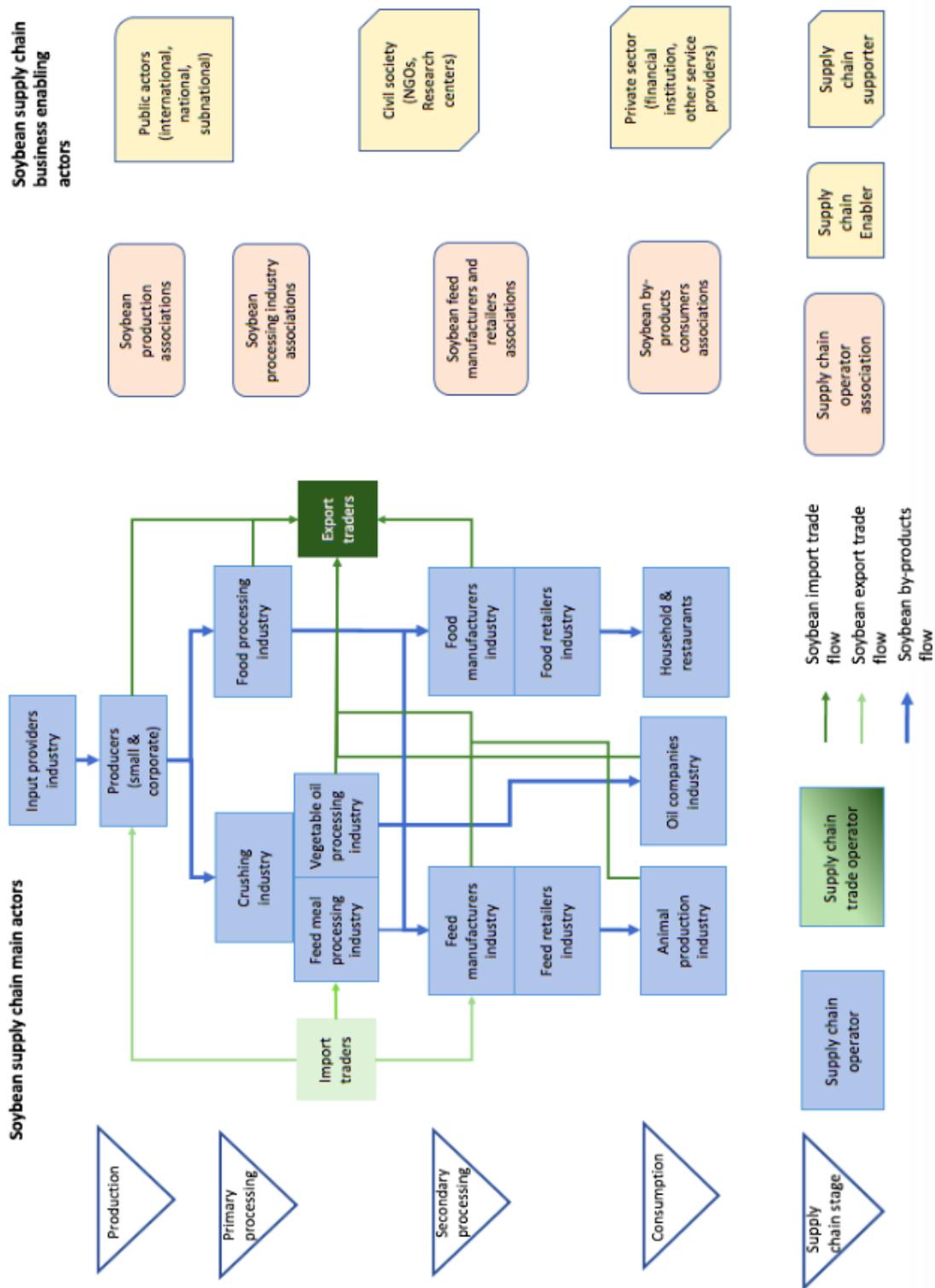


Figure 17 Soybean supply chain main actor mapping