



# **Review of Policy Interventions and Entry Points in Trade Regulations and the Financial Sector**

## **Deliverable D4.1**

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**Transformative pathways for synergising just biodiversity and climate actions**



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## Executive Summary

This report focuses on two sectors that host promising leverage in triggering positive transformative change for climate and biodiversity: international trade and the financial sector.

In **chapter 1**, we explore the world of international trade policies and their profound implications for the environment and broader sustainability goals. Trade has wielded a deep influence on our environment, casting a far-reaching shadow across the globe, and impacting our ecological world. Here, we examine the undeniable connection between trade openness and climate change and scrutinize the intricate relationship between trade and biodiversity. We find that trade openness can have significant ramifications for climate change and biodiversity. The effects of trade on biodiversity are through the spread of pollutants, invasive species, and resource depletion.

Next, we trace the structure of the World Trade Organization (WTO) through the lens of its trade policies and regulations. Findings indicate that traditional trade regulations have evolved into complex structures within the WTO, encompassing agreements on the Sanitary and Phyto-sanitary (SPS) measures and the Technical Barriers to Trade (TBT). Within the European Union (EU), tariff cuts to encourage sustainability regulations seem to hold less promise than these non-tariff measures (NTMs) of the SPS and TBT. These regulations, have a longstanding history in the design of the trade system and hold the potential to reshape international trade towards more environmentally conscious practices.

Furthermore, we traverse pioneering regulations of the EU designed to address environmental concerns and deforestation, illuminating the potential for sustainable change within the scope of international trade. With the critical issue of biodiversity at the centre stage, and a keen focus on corporate sustainability and its role in nurturing ecological well-being, we highlight the EU trade regulations on the environment, that navigate the delicate balance between trade liberalization and environmental protection. Two trade regulations that hold promise emerge: Deforestation and forest law; and carbon border adjustments. The deforestation and forest law emphasizes ambitious trade policies that combat illegal timber trade and deforestation. The intent is to halt global deforestation and thus biodiversity and is gaining support through consumer preferences that are driving increasing corporate sustainability in businesses and supply chains. Both the deforestation law and carbon border adjustments have potential to level the playing field (allow those companies that would like to move forward with sustainability to do so without being outcompeted by companies who gain profit through environmental harming practices) and incentivize carbon-efficient production. Nevertheless, they come with their own set of associated risks, including trade disputes and challenges in implementation. This highlights the need to match top-down regulations with better attention to deliberating and negotiating their implications (risks and uncertainties) in the receiving implementation environment and designing incentives to de-risk the transition and ensure equitable outcomes in the receiving environment.

Finally, our journey culminates in an analysis of trade and sustainability, wherein we highlight the importance of identifying different leverage points and recognizing potential tipping interventions that can propel us toward a more sustainable global trade system. We translate the findings of promising trade mechanisms to the four categories of leverage points defined by Abson (2017), based on Meadows (1999) literature. We identify shallow to deeper leverage points (see Figure A). **Market power leverage** mechanisms, including instruments like the Carbon Border Adjustment Mechanism (CBAM) and zero deforestation commitments, allow for precise adjustments of trade **parameters**, such as taxes, incentives, and standards. At the level of system **feedback**, **traceability** provides an essential aspect of understanding and managing the feedback loops within the system, shedding light on potential issues in the supply chain and paving the way for improvements that can benefit biodiversity conservation. At system **design** level, **certification** processes shape the rules, standards, and information

flows governing product production and trade. Their modification holds the promise of encouraging more sustainable practices and aligning the trade system with broader sustainability goals. **Production techniques**, intimately tied to the **intent** of the system, reflect the values and goals embedded within.

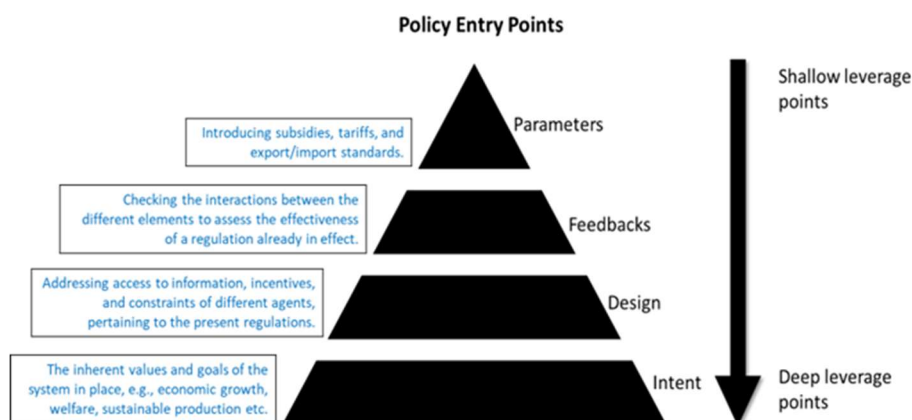


Figure A: Leverage point triangle for trade-related interventions (inspired by Abson, 2017)

Shifting towards sustainable and environmentally friendly production methods is the means to realign the system's intent with the grand vision of sustainability. A combination of these types of instruments will allow us to move trade policies to more sustainable production and consumption practices.

In **chapter 2**, we examine the financial sector and the potential leverage point for transforming it into a support structure for a nature-positive economy. First, we analyze the role of the financial sector in the economy. We note that the financial sector is made up of intermediaries, markets and institutional infrastructures which, together, can be considered the "central nervous system of a market economy". It has the (informal) mandate to create economic value by enabling maturity transformation, better information in asset valuation and risk management, all of which are intended to enable a more "efficient" allocation of capital. We also show that the financial sector is not a neutral player in the economy. It operates within a specific ideological and political and that has wider consequences on the socio-economic landscape. Moreover, it is a vector of power, enabling capital providers to influence companies' activities and time horizons. Finally, the nature and extent of the financial sector's influence is determined by a set of "rules of the game" embodied in a wide range of norms, conventions and regulations that are not immutable, but evolve with the broader socio-economic landscape.

Next, we explore the interactions between the financial sector and nature. First, we show that finance and nature are closely linked by the notion of risk. First, because the financial system is exposed to physical and transitory risks related to ecosystem degradation. Secondly, because, through their financing activities, financial actors can contribute to the aggravation of these risks for themselves or for other actors in the economy. This endogeneity that characterizes nature-related financial risks, combined with the fact that these risks are inherently complex and potentially systemic, leaves financial actors ill-equipped to deal with them. Beyond the issue of managing nature-related risks, there remains the question of how to finance activities that have a positive impact on nature. On this point, we show that nature conservation efforts often have relatively low financial returns and a high level of risk, which, at least in the current context, makes it difficult to align the interests of private investors with environmental objectives. Finally, we look at the different voluntary initiatives and European policies related to sustainable finance to see how they respond to these challenges. We show that sustainability issues have recently gained traction in financial circles. However, it seems that the different efforts towards 'greening' finance echo different worldviews and opinions on the role that the financial sector (should) play in the environmental transition, leading to

different – and arguably antagonistic – theories of change. Thus, the questions of what a financial system would look like to withstand the environmental challenges of the 21st century, and what are the actionable policy levers to achieve it, remain to be answered.

To contribute to this debate, we draw on the work of Meadows (1999) and Abson and colleagues (2017) to identify leverage points for transformative policy interventions within the financial system. We emphasize that a transformative policy approach must intervene coherently and simultaneously at multiple levels of system depth, strategically destabilizing system rigidities and progressively paving the way for deeper interventions. We present three "paradigmatic shifts" that correspond to desirable profound changes in the values, beliefs and objectives that condition the function and trajectory of the financial sector:

- A shift from a financial sector perceived as exogenous to nature, to a financial system that is seen as interacting with, and integrated within, wider socio-ecological systems.
- A shift from a "market fixing" approach that emphasis on self-regulation and limited public intervention, to a "market shaping approach" that actively orients the market towards the realization of major societal challenges.
- The shift from the shareholder primacy paradigm, which formulates the maximization of (short-term) financial returns as listed companies primary objective, to the stakeholder value paradigm, which integrates non-financial stakeholders (e.g., employees, customers, concerned communities) into governance structures, and adopts a broader notion of value that goes beyond purely monetary or financial considerations, but also includes environmental and social outcomes.

For each of these paradigmatic shifts, we present a series of policy interventions that contribute to reinforcing/triggering momentum for such shifts to happen (see Figure B).

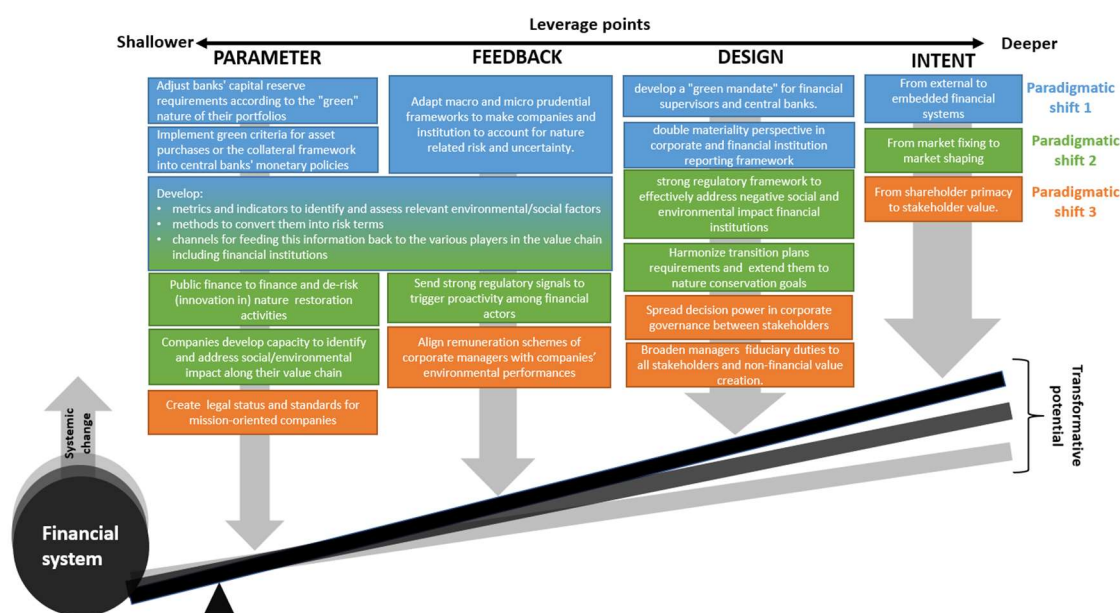


Figure B: Overview of identified leverage points and related policy interventions (source: own elaboration inspired by figure 5 in Pascual et al. (2023))

It is essential to recognize that transformative change is an ongoing process, rather than a final destination, for which we conclude by drawing attention to the specific context of cocoa, where the convergence of international trade, sustainability, and social responsibility assumes paramount importance. In this frame of reference, we aim to translate the identified leverage points into research questions, where the potential for transformative change is both substantial and urgent.

## List of abbreviations

BAU	Business-as-usual
CBAM	Carbon Border Adjustment Mechanism
CETA	Comprehensive Economic and Trade Agreement
CO <sub>2</sub>	Carbon Dioxide
COCOBOD	Ghana Cocoa Board
CSDDD	Corporate Sustainability Due Diligence Directive
CSRD	The Corporate Sustainability Reporting Directive
CVD	Countervailing Duty
DRC	Democratic Republic of the Congo
DSU	Dispute Settlement Understanding
EBA	European Banking Authority
EC	European Commission
EFRAG	European Financial Reporting Advisory Group
ESG	Environmental, Social and Governance
ESRS	European Sustainability Reporting Standards
ETS	Emissions Trading System
EU	European Union
EU FLEGT	European Union Forest Law Enforcement, Governance, and Trade Action Plan
EUTR	European Union Timber Regulation
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Growth Domestic Product
GHG	Greenhouse Gas
HS	Harmonized System
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
ISSB	International Sustainability Standards Board
LBC	Licensed Buying Company
MFN	Most-favoured-nation
MFN	Most-Favoured-Nation
NAFDAC	National Agency for Food and Drug Administration and Control
NFF	Nature Futures Framework
NFRD	Non-Financial Reporting Directive
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
NGO	Non-Governmental Organization
NT	National Treatment
NTM	Non-Tariff Measure
PES	Payment for Ecosystem Services
PRI	Principles for Responsible Investment
PSI	Principles for Sustainable Insurance
QR	Quantitative Restriction
RTA	Regional Trade Agreement
SDG	Sustainable Development Goals
SFRD	Sustainability-related disclosures in the financial services sector



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SME	Small and Medium Enterprise
SPS	Sanitary and Phyto-sanitary
SWF	Sovereign Wealth Fund
TBT	Technical Barriers to Trade
TFCD	Taskforce on Climate-related Financial Disclosures
TFND	Taskforce on Nature-related Financial Disclosures
TRQ	Tariff Rate Quota
UNCTAD	The United Nations Conference on Trade and Development
US	United States
WTO	World Trade Organization

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# Exploring Policy Leverage Points to Trigger Transformative Change in Finance and Trade

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## General Introduction

Global change in nature occurs at a rate unprecedented in human history. Direct drivers of these changes include land and sea-use changes, overexploitation of organisms, climate change, and invasion of alien species. To a very large extent, these direct drivers can be attributed to anthropogenic activities (fishing, agriculture, mining, tourism, etc.), which result from a range of demographic, socio-cultural, economic, technological and governance factors (referred to as indirect or underlying drivers)(IPBES, 2022).

Nature provides us with a range of ecosystem services - such as pollination, freshwater purification, soil fertility or climate regulation – that are essential for our economy and the well-being of our society<sup>1</sup>. While nature conservation issues are gaining ground in public debate, efforts at the level of states, international organizations, and businesses to halt the loss of biodiversity, climate change or other disruptions to natural systems have proved insufficient. A recent study has shown that, among the nine planetary boundaries necessary to ensure a safe operating space for humanity (Rockström et al., 2009), six are currently transgressed, with a general worsening trend (Richardson et al., 2023)

Incremental and siloed measures that target the direct and easily identifiable causes of nature's degradation are not enough. As in any social system, we are locked into path-dependent structures shaped (among other things) by beliefs, culture, incentive structures, habits and technologies (Geels, 2002; Unruh, 2000; Wiedmann et al., 2020). Transformative change is needed to set our society on the path to achieving global social and environmental goals. Triggering this change requires a better understanding of how human and natural systems interact, and the identification of leverage points for strategic policy interventions capable of generating radical changes in system dynamics and outcomes (Abson et al., 2017; Chan et al., 2020; Fischer & Riechers, 2019; Meadows, 1999).

In this report, we focus on two sectors that we believe host promising leverage in triggering transformative change: international trade and the financial sector. The intensification of financial and trade flows has gone hand in hand with globalization. International trade and financial structures are more than ever at the heart of our economic development model, and their influence extends to all sectors of the economy and all regions of the globe. Financial and trade practices also influence the way we use land and sea, the way we extract natural resources, and the extent to which we produce and manage the waste resulting from our economic activities. From this perspective, a transformative change that puts our societies on a trajectory compatible with the great social and environmental challenges of the 21st century, is likely to involve political intervention at the level of the financial sector and trade.

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<sup>1</sup> This paper puts the emphasis on the relevance of nature to the economy and society, and thus the focus on nature in terms of its 'instrumental values' - see (Kim et al., 2023). This is however done in recognition of the fact that conservation activities can be motivated by a wider range of values and motives, including the appreciation of nature for its intrinsic or cultural qualities (IPBES, 2022).

The power of trade as a catalyst of transformative change can be exemplified by the push to eradicate child labour. Trade regulations have played a crucial role in eliminating child labour by setting standards and creating incentives for responsible trade practices. The year 2021 was termed as the International Year for the Elimination of Child Labour, as child labour had decreased by 38 per cent in the last decade. The European Commission set out a 'zero tolerance policy on child labour' for every new trade agreement, enforcing the highest standards of climate, environmental and labour protection. The aim was to bring sustainable development to the centre of any bilateral trade relationship. Accordingly, the EU is reviewed its due diligence legislation throughout the supply chain on human rights in general, including child labour. The European Union is firmly committed to achieving the Sustainable Development Goals (SDG) of ending child labour in all forms by 2025. Through several key mechanisms and developments like labour standards in trade agreements, tariff preferences for compliance, transparency and reporting, multilateral initiatives, and other due diligence requirements, transformative change in addressing child labour has been influenced by trade regulations.

In the past, structural changes in the financial sector had transformative impact on the socio-economic landscape. The Bretton Woods Agreement of 1944, for instance, established an international monetary order after the Second World War, introducing a system of fixed exchange rates anchored by the US dollar. These structural changes were intended to create stability and facilitate international trade and investment. The creation of the International Monetary Fund (IMF) and the World Bank contributed to post-war reconstruction and development, promoting economic growth and social well-being. However, the limitations of this system, notably exchange rate rigidity and power imbalances, would eventually contribute to dissolution of fixed exchange rate regime in the early 1970s. The neo-liberal turn of the 1980s, characterized by deregulation, privatization and market-oriented economic policies, also had far-reaching effects. Intended to foster economic dynamism and innovation, it also increased income inequality and weakened social safety nets. The global financial crisis of 2008, caused by lax financial regulation and risky lending practices, highlighted the drawbacks of a laissez-faire approach. Finally, the digitalization of finance, embodied by the rise of fintech, blockchain and digital payment systems, was also a transformative force. It has revolutionized the way individuals and businesses manage their finances, promoting convenience and accessibility. However, it has also raised concerns about data security, increasing complexity and opacity of financial transactions, leading to significant regulatory challenges. These historical examples underline the profound effects that structural change in the financial sector can have in shaping our economic and social systems. At a time when we are facing unprecedented environmental and social challenges, it is essential to think about how we want to shape the financial sector to help meet these challenges, and what promising policy levers we can identify to achieve this.

The first chapter of this report focuses on trade. In the intricate web of global trade, each thread weaves a story of consequences and opportunities, often extending far beyond economic boundaries. Our journey through this chapter explores the multifaceted relationship between trade and sustainability, casting a spotlight on the many facets of this dynamic interaction. This chapter at the onset, embarks on a quest to decipher the impact of trade on the environment. Next, we delve into the intricacies of how trade activities influence our ecological world. We explore the undeniable connection between trade openness and climate change, and we scrutinize the intricate relationship between trade and biodiversity. We'll also trace the origins of trade regulations by revisiting the traditional norms and rules that have shaped today's trade landscape, followed by an exploration of the structural foundations of the World Trade Organization (WTO). Our path then takes a modern turn as we dissect the frameworks of SPS (Sanitary and Phytosanitary) and TBT (Technical Barriers to Trade) agreements, offering a deeper understanding of their significance in shaping the global trade landscape. The examination then pivots toward the profound impact of trade regulations on the environment. We unveil the critical role these regulations play in steering our collective

efforts toward sustainability and ecological harmony. Within the European Union (EU), we traverse pioneering regulations designed to address environmental concerns and deforestation, illuminating the potential for sustainable change within the scope of international trade. The critical issue of biodiversity takes centre stage, with a keen focus on corporate sustainability and its role in nurturing ecological well-being. We also unravel the emerging concept of carbon border adjustment and the associated risks it carries. Finally, our journey culminates in a sweeping analysis of trade and sustainability, wherein we highlight the importance of identifying different leverage points and recognizing potential tipping points that can propel us toward a more sustainable global trade system. Drawing inspiration from the three horizons literature, we gain insights into the dynamics of change and transformation in the realm of trade and sustainability. Together, these interconnected elements create a comprehensive narrative that unveils the intricate interplay between trade and sustainability, offering a holistic perspective on the complex challenges and opportunities that define our quest for a more sustainable global trade system. We conclude the chapter by identifying leverage points that are essential to the promotion of sustainability and draw the link to our case study- the cocoa sector, which connects us to the subsequent deliverable.

In chapter 2, we examine the financial sector and the role it can play in the transition to a nature-positive economy and society. After a brief introduction (section 1), we present the financial sector and its role in the economy (section 2). What does it entail? What societal functions does it fulfil? What impact does it have on economic activity? and how is this impact modulated by norms, rules and conventions? Having posed these questions, we turn to the interaction between the financial sector and nature (section 3). We begin by asking to what extent the financial sector affects and is affected by nature. We then highlight the various challenges that environmental sustainability poses for the financial sector, and how they are currently being (un)addressed. In section 4, we draw on a systems thinking approach to conceptualize the financial sector as a complex and adaptive system, whose direction and outcomes are determined by a set of elements such as feedbacks, rules, beliefs and goals located at different levels of system "depth". Typically, changes taking place at deeper levels have greater transformative potential but are also more difficult to target with policy interventions. Finally, in section 5, we build on the framework presented in section 4 to identify critical "paradigmatic shifts" in the financial system that we believe hold promise to trigger positive transformative change. For each paradigmatic shift, we present a series of related policy interventions susceptible to create or enhance momentum of these shifts to occur.

Finally, we conclude this report by taking stock of the results of Chapters 1 and 2, and briefly exploring concrete ways to further them empirically using the cocoa sector case study.

## Chapter 1: Regulating trade for transformative change

### 1.1 Introduction

Trade has wielded a profound influence on our environment, casting a far-reaching shadow across the globe and sparking a spirited discourse within the economic literature over the years. Within the intricate web of global trade systems, we find both virtuous and detrimental feedback loops at play, with consequences that reverberate throughout the natural world. A classic example of this is the downward spiral to lower environmental standards and increased pollution, a trajectory often set in motion by fierce state competition for attracting investment. In this exploration, we delve into the multifaceted impact of trade on global activities, shedding light on the intricate interplay between commerce and ecology, and the compelling forces that drive it.

*'Race to the bottom'* has been a part of mainstream economic literature for a couple of decades now. It refers to a competitive situation where there are attempts to undercut the competition's prices by sacrificing quality standards or worker safety (often defying regulation) or reducing labour costs. Under our context, it may be between governments, happening as a result of globalization and free trade. For example, a jurisdiction may relax regulations or cut taxes and compromise the provision of public goods in an attempt to attract investment, such as the building of a new factory or corporate office. The *'pollution haven'* and the *'industry flight'* hypotheses have also been fairly prevalent: the trend of 'environmentally dirty' industries migrating to the pollution havens in the global south; presence of 'dirty' products in the exports of developing nations to the developed world attest to the hypothesis (Jaffe et al., 1995; Low, 1992; Mani and Wheeler, 1998).

The empirical findings on the *'race to the bottom'* theory paint a revealing picture. They indicate that it is the rapidly industrializing nations themselves, rather than those having higher standards, that grapple with the weight of competitiveness concerns pressing down on their standards. This dynamic gives rise to a persistent predicament often described as the "stuck at the bottom" problem, in which rapidly industrializing nations compete on lower standards. An agreement on common minimum trade standards between rapidly industrializing nations can be a potential solution to the problem of standards and trade competition (Porter, 1999).

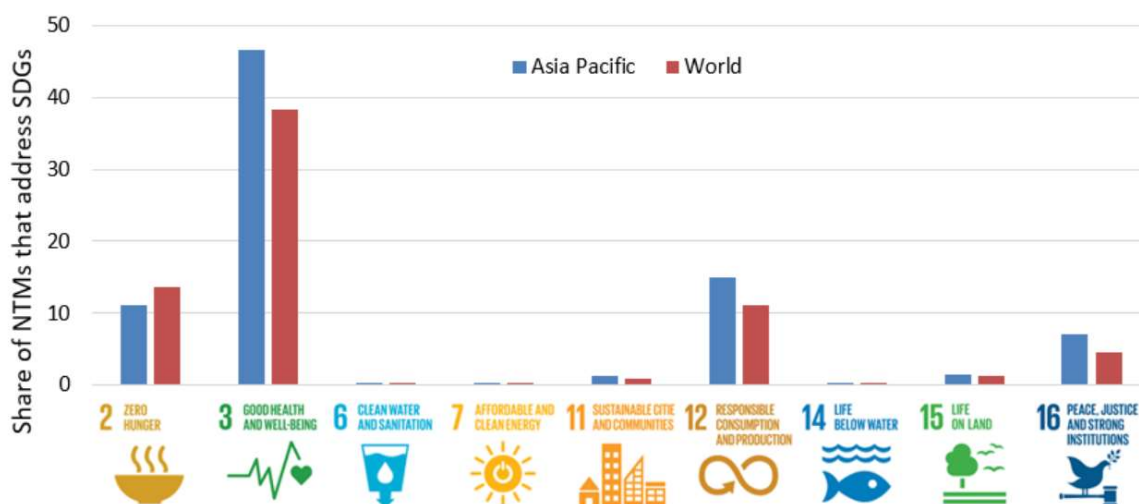
The unequal exchange theory is an economic theory that focuses on the perceived disparities in the terms of trade between developed and developing countries in the global marketplace. This theory posits that that economic growth in the advanced economies of the global North relies on a large net appropriation of resources and labour from the global South, extracted through price differentials in international trade, leading to a net transfer of value or resources from the poorer nations to the wealthier ones. Drain from the South is worth over \$10 trillion per year, in Northern prices, leading to uneven development, greater inequality, and ecological breakdown (Hickel et al., 2022).

The revival of trade regulations, along with the increase in non-tariff measures (NTMs)<sup>2</sup> and other trade-related directives in recent years, has raised important considerations (addressed in detail in Section 1.3). NTMs, which encompass policy measures beyond tariffs that can impact international trade in goods, affecting quantities traded and prices, have now surpassed 50,000 in number. Interestingly, NTMs are increasingly being leveraged to promote

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<sup>2</sup> NTMs include both technical and non-technical measures. The technical measures encompass regulations, standards, testing, and certification; primarily Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT) measures. The non-technical measures include quantitative restrictions (quotas, non-automatic import licensing), price measures, forced logistics or distribution channels.

both market access and sustainable development. According to Ralf Peters, UNCTAD's<sup>3</sup> chief of trade information, these NTMs directly influence 10 out of the 17 sustainable development goals (SDGs). Figure 1-1 depicts the share of NTMs that address these goals comparing Asia Pacific and the World. The advantages of regulatory cooperation become evident as it can reduce trading costs (as per Christian Knebel from UNCTAD's trade division) while still upholding essential public policy objectives related to safety, health, and environmental protection.



Source: UN ESCAP and UNCTAD

Figure 1-1: Snapshot of the share of NTMs that address SDGs comparing Asia Pacific and the World

The next sections delve into the intricate dynamics of trade and its profound ramifications on the environment. We navigate through the various dimensions of this relationship, elucidating the environmental implications of global trade, the policies and mechanisms aimed at mitigating its negative effects, and the imperative for sustainable practices that can harmonize the objectives of economic prosperity and environmental protection in our ever-globalizing world.

## 1.2 Impact of trade on the environment

Modern literature focuses more closely on the negative aspects of climate change and trade on biodiversity, with less emphasis on the impacts of losing biodiversity and its negative effects on climate change and trade. It is widely established that the negative effects of climate change on biodiversity can be exacerbated by trade.

One strand of literature suggests that global trade will accelerate plant invasions in emerging economies under climate change. In the sphere of biodiversity, trade plays a key role in the spread of alien species and has arguably contributed to the recent enormous acceleration of biological invasions, thus **homogenizing biotas** worldwide. A particularly strong increase in naturalized plant numbers is predicted in the next 20 years for emerging economies in megadiverse regions. The interaction with the imminent future climate change will increase invasions in northern temperate countries and reduce them in tropical and subtropical regions, but not by enough to cancel out the trade-related increase (Seebens et al., 2015).

On the other hand, another prominent branch of literature suggests that extreme changes in the weather can disrupt supply chains, damage the transport infrastructure necessary for trade

<sup>3</sup> United Nations Conference on Trade and Development

in goods, and restrict people's ability to travel. Changing climatic conditions and the policies introduced to address them are not only reshaping the patterns of comparative advantage but also interlocking with biodiversity threats, thereby amplifying the complexities of global supply chains. These developments pose risks to nations heavily reliant on climate-vulnerable sectors, yet parallelly, they unveil fresh economic opportunities for countries endowed with abundant renewable energy resources like wind, sunlight, and critical minerals essential for clean infrastructure manufacturing. In agriculture, the shifts in temperature, characterized by more frequent heatwaves and land degradation, alongside alterations in precipitation levels leading to water stress and drought, collectively pose threats to agricultural output and contribute to the escalation of food prices. Developing economies in sub-Saharan Africa and South Asia are particularly vulnerable to this kind of damage, as they are highly dependent on agricultural exports and large fractions of their populations are employed in the sector (Kyriakopoulou et al., 2023).

**Land use change**, often driven by the expansion of agriculture, results in not only direct habitat loss but also various other impacts on biodiversity. These include the fragmentation of remaining habitats and an increased influx of agrochemical inputs into the surrounding natural or semi-natural areas (Donal et al., 2001). Additionally, modifications to land management practices, such as alterations in grazing regimes, can have significant direct consequences on biodiversity (McGovern et al., 2002). The economic actors adjust faster than nature that has already been destroyed, and due to the recuperation pace being highly different, the impact of global trade on biodiversity through the channels of price change and market dynamics is considerably large and enables a feedback chain.

Along with land use change due to agriculture and the threat of climate change, there is a pressing need for evaluating the concealed biodiversity repercussions associated with international trade. It has been determined that 83% of the overall loss of species is attributed to agricultural land use dedicated to domestic consumption, while 17% is linked to export-oriented production. Notably, exports from Indonesia to the United States and China exhibit the most substantial impacts, each resulting in the loss of 20 species at the regional level. In general, economically developed nations with high per capita GDP tend to be prominent net importers of biodiversity impacts originating from developing tropical countries. The findings underscore that the land area occupied is an inadequate indicator of the biodiversity implications within trade flows, particularly for crops with minimal global acreage, such as sugarcane, palm oil, rubber, and coffee, which paradoxically have disproportionately substantial impacts on biodiversity (Chaudhary and Kastner, 2016). The globalization of food production has led to a spatial decoupling of production and consumption, whereby subsistence needs that used to be met by local resources are now being supplied by other regions via increased trade flows. Having a better understanding of the interactions within the environment-agriculture-trade system (as illustrated by Figure 1-2) will be essential to meet the SDGs and develop a food system that is able to support the demand of a growing human population and to conserve biodiversity (Ortiz et al., 2021).

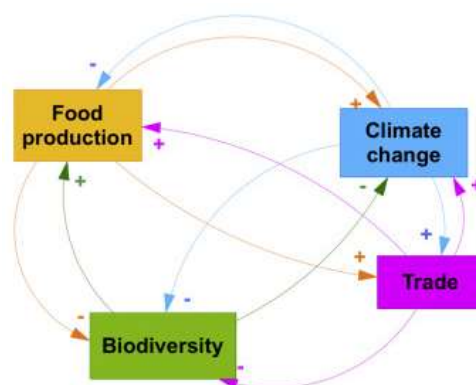


Figure 1-2: Interaction of trade with different sectors (Ortiz et al., 2021)

Findings from Lenzen et al. (2012) show that local threats to species are driven by economic activity and consumer demand across the world. Consequently, the authors advise that policies aimed at reducing local threats to species should be designed from a global perspective, considering not just the local producers who directly degrade and destroy habitat but also the consumers who benefit from the degradation and destruction (see Figure 1-2).

In the following subsections, we shall conduct a comprehensive analysis of the potential of global trade regulation to play a pivotal role in mitigating the imminent threat of biodiversity loss.

### 1.2.1 The impact of trade openness on climate change

The expansion of international trade has been enormous. Since 1950, world trade has grown more than twenty-seven-fold in volume terms. By way of comparison, the level of world GDP rose eight-fold during the same period. Consequently, the share of international trade in world GDP has risen from 5.5 per cent in 1950 to 20.5 per cent in 2006. Technological innovations and changes in trade and investment policies have both democratized trade and made it easier to “unbundle” production, making it spread out globally, through increasing integration of global supply chains.

In order to address the multifaceted impacts of trade on climate change and the environment, we use the decomposition paradigm. It allows us to dissect and comprehend the distinct effects that trade activities have on environmental matters. For the emission of greenhouse gases, the “scale” effect refers to the impact on greenhouse gas emissions from the increased output or economic activity resulting from freer trade, as a general presumption. The “composition” effect refers to the way that trade liberalization changes the mix of a country’s production towards those products where it has a comparative advantage. And trade opening can lead to improvements in energy efficiency - the “technique” effect, so that the production of goods and services generates less greenhouse gas emissions. Hence, freer trade will increase the availability and lower the cost of environmentally friendly goods, services, and technologies. Finally, the increase in income that trade brings about can lead society to demand better environmental quality, or less greenhouse gas emissions. We elaborate on this decomposition paradigm in Section 1.5: ‘Transformative pathways towards sustainability in trade’ using the language of leverage and tipping points, introducing potential scopes of intervention in this domain.

International trade involves countries specializing in and exporting goods in which they have a comparative advantage and importing other goods from their trade partners. This specialization inevitably leads to an increased use of transportation services. However, the real “carbon footprint” of domestically produced versus imported foodstuffs is very complex. Transport mode (air, road, maritime or rail) and distance are not the only significant contributors to CO<sub>2</sub> emissions. The life cycle of products, including production methods (e.g., heated greenhouses vs. open-air production; energy-intensive modern techniques vs. hand labour) also plays a big part. Hence, the net direction of movement for carbon emissions is ambiguous.

### 1.2.2 Trade and biodiversity

Global trade is undeniably linked to biodiversity losses, presenting a multifaceted impact. There are both direct and indirect effects:

- **Directly**, this connection arises from the environmental consequences of transport, including induced pollution and the introduction of pathogens and invasive species into new ecosystems.



- Furthermore, global trade exerts an **indirect** influence on biodiversity losses through a complex interplay of factors, such as habitat changes, overexploitation, and various other forms of pollution (DGEP EuroParl, 2020).

It is noteworthy, however, to distinguish between the broad implications of general trade interactions on biodiversity—both direct and indirect—and the specific realm of trade pertaining to the exploitation of animal and plant species in the wild, which falls under the purview of BioTrade, a framework established by UNCTAD. It is especially created for the cause to ensure sustainable collection, production, transformation and commercialization of goods and services derived from wild biodiversity.

In our discussion, we focus primarily on the former, specifically the intricate network of **indirect** impacts, as they play a pivotal role in shaping the relationship between global trade and biodiversity and are key to transformative changes that interrogate root causes. This distinction clarifies our analytical scope within the context of the complex interrelationship between trade dynamics and biodiversity conservation.

One of the adverse aspects is that, under the domain of biodiversity, trade plays a role in the **uniformization and homogenization** of cultivated species. Global trade carries out the dissemination of innovation. Since most productive varieties tend to be used more widely, an increase in economic competition under freer trade is observed. For transportation, which is a sector majorly boosted by the influx of trade, all emissions caused by transport have a significant effect on biodiversity. Black carbon and other large particles thus emitted carry smaller polluting particles and potentially dangerous pathogens such as spores or viruses, that cause considerable harm to the vegetation. Emissions exacerbate climate change, which acts as a further amplifier of the pressures on biodiversity (e.g., invasive species expansion, habitat deterioration, pollution).

**Cultural aspects** of species are matters of concern when homogenization of cultivated species is carried out under the purview of trade. Keystone species are such an example with their functional role benefiting both nature and people (e.g., top predators play an important function by controlling herbivore populations but incidentally this also reduces damage to crops) (Schmitz et al., 2018, Martin et al., 2020). However, cultural, natural, and environmental benefits might not be affected in the same manner. Modern literature on sustainability and biodiversity promotes the Nature Futures Framework (NFF) that acknowledges the diverse ways in which individuals and societies value nature and categorizes perspectives into three main categories. The "Nature for Nature" perspective appreciates and preserves nature for its intrinsic and existence values, emphasizing the preservation of natural processes and biodiversity. The "Nature for Society" perspective focuses on the instrumental benefits of nature for people, such as supporting agriculture and climate regulation. The "Nature as Culture" perspective values the interconnected relationship between nature and human culture, emphasizing co-creation and preservation of cultural and natural heritage. These notions aim to expand stakeholders' visions for the future by exploring various scenarios and interventions that consider factors like the autonomy of nature, instrumental values, and the role of culture in shaping and being shaped by nature. It's important to note that these perspectives simplify the complex array of individual and community perspectives on nature (Kim et al., 2023).

As a potential solution to trade and growth-related damages, Carmenta et al., (2023) suggests a dual-branched conservation model that commands novel actions to tackle distant wealth-related drivers of biodiversity decline, while enhancing site-level conservation to empower biodiversity stewards. It is termed as Connected conservation, an idealistic alternative lifestyle that requires bringing together a wide range of stakeholders and sectors to demystify and popularize contemporary '**alternative**' **living models** that respect planetary boundaries (Rockström et al., 2009; Raworth, 2017). Addressing ecological gratification over economic growth, Connected Conservation identifies and lobbies policies that convey broad ideological

shifts towards the “subordination of economic objectives to ecological criteria” (Raymond et al., 2013; Escobar, 2015; Hughes et al., 2017). While this concept offers a potential solution to address the wealth-related drivers of biodiversity decline, it is essential to approach such methods and solutions with a degree of caution, particularly when viewed through the lens of economic development and growth. Additionally, there could be scepticism about the feasibility of implementing such a paradigm shift in the current global economic landscape. Achieving a widespread commitment to Connected Conservation would require a significant transformation of existing policies, industries, and societal values. Striking a balance between ecological preservation and economic prosperity remains a complex and evolving issue that requires careful consideration and dialogue among stakeholders from diverse sectors.

Hence, our scope of focus will lie on addressing the impacts of trade on biodiversity through the lenses of economic theories, trade regulations, and leverage points.

### 1.3 How has trade traditionally been regulated?

Globalization has undeniably played a significant role in exerting pressure on the environment. Trade economists and environmentalists have been prompted to evaluate how the rapid growth of international trade and investment flows has increased concerns about competitiveness and market access, both of which are sometimes seen to conflict with environmental policy (Copeland, 2010).

WTO sets the general regulations for trade at the global level (see Figure 1-3). However, when it comes to addressing environment and biodiversity issues, under the current framework of WTO rules there is very little room for using **Tariffs**<sup>4</sup> as an instrument to change trade flows towards climate and biodiversity goals.

The 1947 GATT Agreement provides some room for manoeuvre through in its Article XX, which allows “measures relating to the conservation of exhaustible natural resources”, thus providing support to measures regulating biodiversity-related goods. However, without entering into a complex multilateral negotiation, it is difficult to raise tariffs on products whose production abroad or consumption in Europe would have negative impacts on biodiversity, this problem is addressed comprehensively in this subsection.

As per the Marrakesh Agreement, the World Trade Organisation (WTO) was formally established as an intergovernmental organisation tasked with facilitating and regulating trade between nations. Nations that are considered ‘members’ of the WTO have successfully completed the accession process. Those negotiating membership are considered ‘observers’.

Through its regulatory framework, members are provided the following:

- 1) A forum for settling trade-related disputes.
- 2) A platform for nations to engage in trade negotiations.
- 3) Other developmental advantages for nations looking to expand trade capacity.
- 4) Consistent dialogue with NGOs, governments, and the general public.

In summary, the WTO regulatory framework includes a series of agreements which stipulate rules (and exceptions where applicable) that members must abide by. The flexibility of the

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<sup>4</sup> Tariffs or customs duties are a tax on products purchased from abroad, i.e., taxes imposed by one country on goods or services imported from another country. Tariffs are trade barriers that raise prices and reduce available quantities of goods and services. We shall discuss the Tariffs and Non-Tariff measures of the WTO in detail in this section.

regulations allows members to balance its obligations to the WTO with the interests and wellbeing of its own citizens. Amongst others, the GATT stands as an essential regulatory pillar which predates the existence of the WTO itself and forms the underlying principle basis of the GATS (GSLA, 2021).

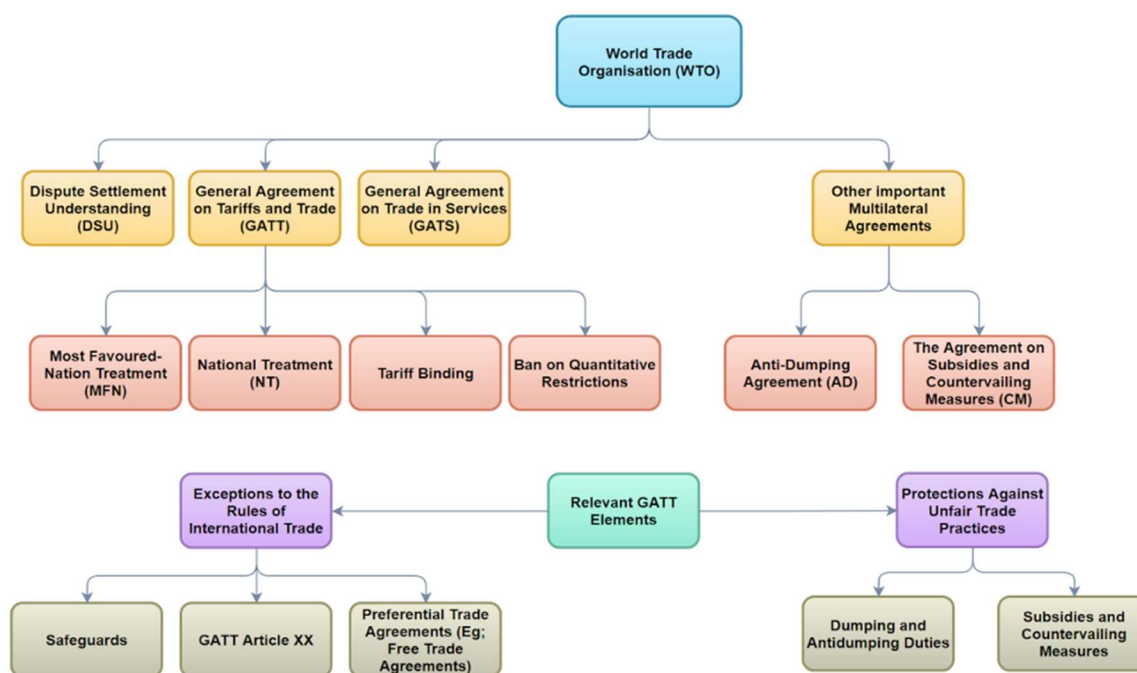


Figure 1-3: Key elements of WTO's regulatory framework (Source: GSLA, 2021)

Figure 1-3 explains the key elements of WTO's regulatory framework. The composition of the regulatory framework, eg; GATT; GATS; DSU (in yellow boxes), can be broken down into the following five inherent factors:

- 1) Non-discriminatory trading
- 2) Lowered trade barriers
- 3) Predictable and transparent global trade rules
- 4) Healthy competition between members (and the discouragement of 'unfair' trade practices), and
- 5) Environmental protection.

In an ideal world, every nation would embody these factors in the actions it undertakes within the international trade realm. These five factors are borne from international co-operation and are critical to trade recovery. However, as mentioned previously, certain industries have taken a drastic hit during this unprecedented period. For countries which specialise in the production of goods and services within impacted industries, they may take certain measures to protect the interests and wellbeing of its citizens and economies that do not conform with these stated principles.

In the second level of Figure 1-3 (the pink boxes), we have the different principles of the WTO trading system:

- 1) **Most-favoured-nation (MFN):** Treating other people equally. Under the WTO agreements, countries cannot normally discriminate between their trading partners. Grant someone a special favour (such as a lower customs duty rate for one of their products) and you have to do the same for all other WTO members.

- 2) **National treatment:** Treating foreigners and locals equally (giving others the same treatment as one's own nationals). Imported and locally-produced goods should be treated equally — at least after the foreign goods have entered the market. The same should apply to foreign and domestic services, and to foreign and local trademarks, copyrights and patents.
- 3) **Tariff binding:** Commitment not to increase a rate of duty beyond an agreed level. Once a rate of duty is bound, it may not be raised without compensating the affected parties.
- 4) **Quantitative restrictions (QR):** No prohibitions or restrictions of importation, exportation or sale for export of products other than measures that take the form of duties, taxes or other charges. Although Article XI of the GATT provides for the general elimination of quantitative restrictions, they are allowed in certain specific circumstances. Measures that are not covered by the QR Decision are: SPS measures, TBT measures, Automatic import licensing, and Tariff Rate Quotas (TRQs).
- 5) **Antidumping Agreement:** Governs the application of anti-dumping measures by WTO member countries. A product is considered to be “dumped” if it is exported to another country at a price below the normal price of a like product in the exporting country. Anti-dumping measures are unilateral remedies (the imposition of anti-dumping duties on the product in question) that the government of the importing country may apply after a thorough investigation has determined that the product is, in fact, being dumped, and that sales of the dumped product are causing material injury to a domestic industry that produces a like product.
- 6) **Subsidies and Countervailing Measures (Subsidies Agreement):** Provides rules for the use of government subsidies and for the application of remedies to address subsidized trade that has harmful commercial effects. These remedies can be pursued through the WTO's dispute settlement procedures, or through a countervailing duty (CVD) investigation which can be undertaken unilaterally by any WTO member government.

After discussing the main principles of the WTO, we now turn to describe the different measures and policies of trade regulation and facilitation, and their potential to promote sustainable practices of production and exports. Figure 1-4 provides a clear overview of the different trade policy instruments, stating their position in the value chain, i.e., whether they are ‘at the border’, ‘behind the border’, or ‘beyond the border’. The figure also depicts how raw materials and intermediate goods move to distribution. Under ‘Trade Policy Instruments’, we have the six subsections:

- 1) Cost of Inputs
- 2) Infrastructure Services Costs
- 3) Business Environment
- 4) Standards Compliance
- 5) Export Costs, and
- 6) Market Access

We discuss the important measures under these subsections (as depicted by Figure 1-4):

**Tariffs:** Within the framework of WTO rules, a distinction is made between the level of most-favoured nation (MFN) and the preferential level. A given importer applies the MFN tariff by default to all its trading partners. It is defined at the level of imported products (in the HS code

system)<sup>5</sup>. A tariff lower than MFN is allowed in the context of tariff preferences granted either unilaterally (e.g., to certain developing countries under the Generalised System of Preferences) or in the context of trade agreements.

**Binding Tariffs:** As discussed before, WTO countries have committed to not exceed this binding level of tariff. Focusing on the European Union, the level of the MFN tariff is almost equal to the binding level. Hence, for the EU it is not possible to raise its MFN duties beyond the current level, except by opening negotiations with all its trading partners. This factor therefore limits the possibilities of raising tariffs on products whose production abroad or consumption in Europe would have negative impacts on biodiversity.

Example: MFN tariff rate for crude oil, iron ore, copper, nickel, and zinc are null, which means that their imports are duty-free. The import duties on these products cannot be suddenly raised, even in the context of a trade agreement. However, there are other instruments that can be utilized to reduce their import flows in the short run, which we discuss henceforth.

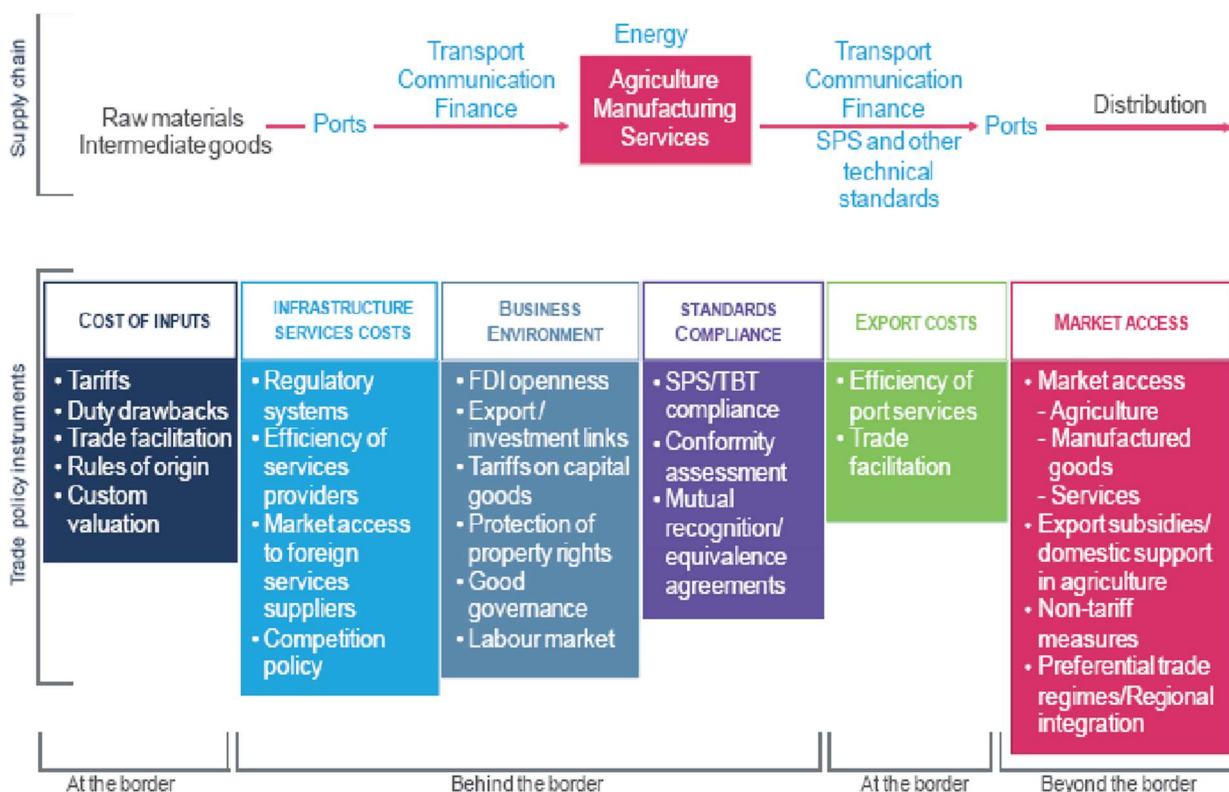


Figure 1-4: Trade Policy Instruments (Source: ITC, 2011)

**Preferential Trade Arrangement (PTAs):** This is the term used in the WTO for trade preferences, such as lower or zero tariffs, which a member may offer to a trade partner unilaterally. These include the Generalized System of Preferences schemes, under which developed countries grant preferential tariffs to imports from developing countries. They also include non-reciprocal preferential schemes granted through a waiver by the General Council, meaning the member has been exempted from applying the most-favoured nation (MFN) principle.

<sup>5</sup> Among industry classification systems, Harmonized System (HS) Codes are commonly used throughout the export process for goods. The Harmonized System is a standardized numerical method of classifying traded products to check what tariff lines and rules apply. It is used by customs authorities around the world to identify products when assessing duties and taxes and for gathering statistics.

**Non-Tariff Measures (NTM):** These are trade measures for the protection of domestic producers other than a tariff. In the current context of low tariffs, NTMs represent the main protection for the EU market. They are relatively flexible and are oftentimes used to protect biodiversity. NTMs based on a legitimate goal (in particular the protection of human, animal or plant health, which can be related to biodiversity) can be introduced in a WTO-consistent manner. In particular, the agreements on **Sanitary and Phyto-Sanitary (SPS)** measures and **Technical Barriers to Trade (TBTs)** aim at defining legitimate goals and set other conditions and modalities to allow governments to take due care of the protection of these objectives while minimizing the impact on trade and avoiding the use of other NTMs as disguised protectionism. Trade in services is also affected by the implementation of non-tariff measures. For example, presently the EU applies import and export bans for certain animal and plant species classified as invasive (EU trade and biodiversity, 2020).

**Sanitary and Phyto-Sanitary (SPS):** Under the purview of WTO SPS regulations, all countries maintain measures to ensure that food is safe for consumers, and to prevent the spread of pests or diseases among animals and plants. These sanitary and phytosanitary measures can take many forms, such as requiring products to come from a disease-free area, inspection of products, specific treatment, or processing of products, setting allowable maximum levels of pesticide residues or limiting the permitted use of additives in food. Sanitary (human and animal health) and phytosanitary (plant health) measures apply to domestically produced food or local animal and plant diseases, as well as to products coming from other countries. Pesticide regulations are mostly taken care of by the SPS measures.

**Technical Barriers to Trade (TBT):** The TBT agreement aims to ensure that technical regulations, standards, and conformity assessment procedures are non-discriminatory and do not create unnecessary obstacles to trade. At the same time, it recognizes WTO members' right to implement measures to achieve legitimate policy objectives, such as the protection of human health and safety, or the protection of the environment. The TBT Agreement strongly encourages members to base their measures on international standards as a conduit to facilitate trade. Through its transparency provisions, it also aims to create a predictable trading environment.

**The issue of Human Rights:** The WTO views production efficiency and openness to trade as the key to economic growth, which is considered essential for the development agenda. Therefore, member states are free to pursue human and labour rights objectives as long as trade is left unaffected. Critics argue that the effect of trade on developing countries' industries is too great for it to be treated separately from other development goals. Instead of trade policies focusing primarily on economic growth, broader trade policy objectives that acknowledge the importance of human and labour rights could accelerate the achievement of the United Nations sustainable development goals (SDGs). In a globalised world, trade, economic growth, labour rights and human rights are deeply intertwined. It might be a popular opinion that 'The WTO tramples over labour and human rights'. However, the WTO has never ruled on child labour because the issue has never come up for a ruling. Countries' efforts to deal with child labour problems have never been challenged in the WTO.

**Certification:** Product certification or product qualification is the process of certifying that a certain product has passed performance tests and quality assurance tests, and meets qualification criteria stipulated in contracts, regulations, or specifications (sometimes called "certification schemes" in the product certification industry). Main examples are: Fair Trade, Organic, Rainforest alliance, and so forth. They are intertwined with the World Trade Organization (WTO) in the context of international trade. Certification standards are technical specifications and criteria used to ensure the quality, safety, and compliance of products and services, often with a focus on environmental, health, and safety concerns. They play a crucial role in adhering to the SPS and TBT measures.

## 1.4 Zooming in: Trade Regulations and the Environment

Economic theory provides a compelling rationale for the vital link between trade regulations and environmental protection. It underscores that engaging in trade with countries that fail to safeguard their renewable resources can ultimately have detrimental consequences for all parties involved. In this complex landscape, developed nations have at their disposal a diverse toolkit of instruments, ranging from border controls to provisions of preferential agreements, aimed at preserving global biodiversity. These solutions manifest in the form of binding mechanisms, reinforced by transparent and automatic sanctions in cases of non-compliance. One pivotal challenge in the realm of global trade lies in the imperative to mitigate the 'displacement effect,' wherein exports are simply redirected to regions with less stringent import standards. This practice can undeniably protect local biodiversity at the expense of ecosystems abroad, mirroring the concept of 'carbon leakage' observed in the context of greenhouse gas emissions. This crucial intersection of trade regulations and environmental sustainability calls for a comprehensive approach that encompasses not only international trade policy, but also local environmental measures aimed at reducing the impact of infrastructure and enhancing air quality and emissions controls, particularly within the international transportation sector. In this investigation of trade regulations and the environment, we dive into the different strategies and challenges associated with synchronising economic activity and environmental preservation, with a clear focus on the European Union.

### 1.4.1 Case in point: Cocoa and Coffee:

#### a. In Cocoa production and trade:

Deforestation and child labour are two major issues of concern, among others. Cocoa farmers usually clear tropical forests to plant new cocoa trees rather than reusing the same land. That practice has spurred massive deforestation in West Africa, particularly in Ivory Coast. Experts estimate that 70% of the country's illegal deforestation is related to cocoa farming. A large section of the sector is under the poverty line. West Africa's cocoa farmers frequently use child labour to help with growing, harvesting, and transporting cocoa beans. During the 2013-14 growing season, an estimated 2 million children were used for hazardous labour throughout Ghana and Ivory Coast (WWF report, 2017).

#### b. In Coffee production and trade:

A major concern for the production of coffee is clearing forests for coffee plantations. Traditionally, shade grown coffee conserved the soil and original forests. But the huge increase in demand for coffee has transformed a shift from shade to sun-grown coffee. Sun-grown coffee requires clearing of forests and the use of chemical fertilizers also, as the topsoil is eroded. More than 40 percent of the coffee area in Colombia, Mexico, Central America, and the Caribbean has been converted to sun coffee. An additional 25 percent is currently under conversion. According to some estimates, every cup of coffee consumed destroys roughly one square-inch of rainforest, which in turn reduces biodiversity and plays a critical role in the extinction of some species. It is also highly water demanding, requiring 140 litres of water to produce one cup of coffee (WEF, 2019).

Table 1-1 cites the important trade regulations concerning cocoa and coffee.

Table 1-1: Trade Regulations concerning cocoa and coffee

Policy / interventions	Implemented by	Recipients	Year of Implementation	Details of the policy
Cocoa and Cocoa Products Regulations 2019 (Legislation/Regulation) : Cocoa	National Agency for Food and Drug Administration and Control (NAFDAC) of Nigeria	Africa, North Atlantic, Western Africa	2019	These Regulations of the Nigerian National Agency for Food and Drug Administration and Control (NAFDAC) prescribe quality and labelling requirements for cocoa and cocoa products and provide for the classification of cacao and cacao products. Categorization, definitions, composition, and properties of cocoa products shall be as specified in Schedule A to these Regulations. Permitted additives used in cocoa products shall be as specified in Schedule B and products shall not contain contaminants in excess of the quantity specified in schedule C to these Regulations.
Export of Cocoa Regulations/ Ghana Cocoa Board Act (Legislation/Regulation) : Cocoa	Ghana Cocoa Board (COCOBOARD)	Africa, North Atlantic, Western Africa	1984	These Regulations provide rules for (control on) the export of cocoa from Ghana by a Licensed Buying Company (LBC). LBCs must meet certain criteria to obtain an export license from the Ghana Cocoa Board. They must have participated in the internal marketing of cocoa for a minimum period of two cocoa crop years. LBCs may join to form an export company if they do not qualify to export, they may market and export their quota through any licensed exporter. The Regulations provide for the establishment and/or appointment of the Cocoa Sector Marketing Committee, an e Export Sales Committee and a Board of Appeal. Quality control shall be carried out by the Quality Control Division of the Ghana Cocoa Board.
DIRECTIVE 2000/36/EC (Directive) : Cocoa	The European Parliament and of the Council	All member states	2000	Cocoa and chocolate products intended for human consumption.
COUNCIL DECISION (EU) 2016/1850 (INTERNATIONAL AGREEMENTS non legislative law):	EU Council	Ghana, and the European Community and its Member States	2008	Tariff Preference signature and provisional application of the steppingstone- Economic Partnership Agreement between Ghana, of the one part, and the European Community and its Member States, of the other part.



Cocoa (major one) but other products too

COUNCIL REGULATION (EEC) No 2658/87 (EU law): All products	EU Council	ERGA OMNES and member states	1987 (Amended 1999)	Third country duty regulation on the tariff and statistical nomenclature and on the Common Customs Tariff.
COMMISSION IMPLEMENTING REGULATION (EU) 2021/608 (EU regulation): All products	EU Council	Third countries and member states	2021 (Amended) Originally 2019	Amending Implementing Regulation (EU) 2019/1793 on the temporary increase of official controls and emergency measures governing the entry into the Union of certain goods from certain third and emergency measures governing the entry into the Union of certain goods from certain third countries implementing Regulations (EU) 2017/625 and (EC) No 178/2002 of the European Parliament and of the Council.
COMMISSION REGULATION (EC) No 1881/2006 (EC regulation): All products	EU Council	All member states	2006 December	Regulation for setting maximum levels for certain contaminants in foodstuff.
EU Law D0734/12 (EU agreement): All products (major cocoa)	EU Council	Central America, and European Union and its Member States	2013 August	Tariff Preference Law establishing an Association between the European Union and its Member States, on the one hand, and Central America on the other.
EU Law D0156/09 (EU agreement): All products (major cocoa)	EU Council	Ivory Coast, and the European Community and its Member States.	2016 September	Tariff Preference: COUNCIL DECISION on the signature and provisional application of the steppingstone Economic Partnership Agreement between Côte d'Ivoire, of the one part, and the European Community and its Member States, of the other part

## 1.4.2 Regulations

In its trade regulations, EU is one of the regions having a higher average number of environmental provisions in the RTAs (Regional Trade Agreements). It signs 54, together with the United States (US) and Canada (respectively 66 and 57). CETA (Comprehensive Economic and Trade Agreement, between the EU and Canada) shows the highest number of environmental provisions, around 100, in any RTA signed between the global north, while the RTA between Central America and the EU holds this record (around 130 provisions) for the highest number of RTAs signed between the global northern and southern trading partners. The general trend on environmental provisions is also true for those specifically dealing with

biodiversity, which we discuss in the following part. For instance, among the most widely used environmental norms in trade agreements, the first place is occupied by exceptions for the conservation of natural resources, followed by those concerning the protection of plants and animals. These environmental provisions target a wide range of issues, from hazardous waste, deforestation, to Greenhouse Gas (GHG) emissions.

In the preamble of the Marrakech Agreement that established the WTO, the provisions of the main objectives of the organization “in accordance with the sustainable development goals, the optimal use of the world resources, and the realization by protecting the environment” are included. Hence, these following directives and regulations as implemented by the EU is discussed below:

**a. Deforestation and Forest Law Enforcement:**

The intertwined challenges of deforestation and trade represent a critical intersection of environmental sustainability and globalisation. Deforestation, the widespread clearing of forests, poses grave threats to biodiversity, climate stability, and ecosystem services. EU has adopted several policies and initiatives to address deforestation and promote sustainable forest management, which aim to combat this problem globally and reduce the environmental and social impacts associated with the production and trade of key commodities linked to deforestation.

The European Union Forest Law Enforcement, Governance, and Trade Action Plan (EU FLEGT Action Plan), initiated in 2003, is a robust effort by the European Union to combat the detrimental effects of illegal logging, addressing both the environmental harm and associated social and economic consequences. This comprehensive plan extends its reach to actions within the EU and in tropical timber-exporting countries that have trading relations with the EU. Central to this strategy is a regulation preventing EU businesses from engaging in the import or trade of illegal timber, coupled with the establishment of bilateral trade agreements with timber-exporting nations. While a primary focus of the FLEGT Action Plan is to promote the trade of legally sourced timber products and dissuade illicit trade, it also delves deeper into tackling the governance issues that perpetuate illegal logging. Part of this initiative includes the EU Timber Regulation, introduced around 2010, which mandates that timber importers and traders within the EU deal exclusively in legally sourced timber, accompanied by due diligence procedures to ensure supply chain legality. The regulation also calls upon EU member states to enact legislation, procedures, and penalties to enforce compliance, with the majority of member states already having done so by 2015. This multifaceted approach underscores the EU's commitment to addressing deforestation and bolstering forest law enforcement.

In literature it is established that FLEGT creates a non-tariff trade barrier at the non-tropical regions' conventional wood markets. This situation allows conventional wood producers to benefit from monopoly rents. The presence of transport costs prevents consumers from switching to foreign producers. In addition, producers in tropical regions cannot compete with the more efficient producers in the non-tropical regions on the certified market. As such, FLEGT curtails part of the international trade flows which decreases global quasi-welfare, with especially consumers being hit. To tackle those issues, non-compliant producers should be assisted in reaching the legality requirements to turn FLEGT into a fully inclusive policy (Brusselaers and Buysse, 2021).

However, in another strand of literature, some critics argue that the prohibition on illegal timber could potentially come into conflict with two treaties under the jurisdiction of the WTO: the agreement on TBT and the GATT. WTO dispute resolution panels have not previously encountered a regulation quite like the European Union Timber Regulation (EUTR). In contrast to previous regulations, the EUTR aims to restrict trade based on foreign definitions of legality rather than imposing its own substantive requirements. There is a plausible argument that

such an approach might be viewed as an impermissible trade restriction (Fishman and Obidzinski, 2014). More on these relevant policies below (see Table 1-2):

*Table 1-2: EU regulations regarding deforestation and forest-law enforcement*

<b>Policy / interventions</b>	<b>Implemented by</b>	<b>Recipients</b>	<b>Description</b>	<b>Details of the policy</b>
EU Regulation on deforestation-free supply chains and products (Regulation (EU) No 2023/1115) (EU agreement): palm oil, cattle, soy, coffee, cocoa, timber, and rubber as well as derived products (such as beef, furniture, or chocolate): Traceability angle	EU Council	Third Countries and Member States	Agreement reached in Dec. 2022. To be formally adopted. Implementation 18 month following adoption.	The new regulation sets strong mandatory due diligence rules for companies that want to place relevant products on the EU market or export them. Operators and traders will have to prove that the products are both deforestation-free (produced on land that was not subject to deforestation after 31 December 2020) and legal (compliant with all relevant applicable laws in force in the country of production). Companies will also be required to collect precise geographical information on the farmland where the commodities that they source have been grown, so that these commodities can be checked for compliance. Member States need to make sure that not complying with the rules leads to effective and dissuasive penalties.
FLEGT Regulation (Council Regulation (EC) No 2173/2005) - allowing for the control of the entry of timber to the EU from countries entering into bilateral Voluntary Partnership Agreements (VPA) (EU regulation): Timber	EU Council	Third Countries and Member States	COUNCIL REGULATION (EC) on the establishment of a FLEGT licensing scheme for imports of timber into the European Community.	This Regulation establishes a community set of rules for the import of certain timber products for the purposes of implementing the FLEGT licensing scheme.
EU Timber Regulation (Regulation (EU) No 995/2010) - to prohibit placing of illegal timber and timber products on the internal market (EU regulation): Timber	EU Council	Third Countries and Member States	Commission Regulation (EC) for detailed measures for the implementation of Council Regulation on the establishment of a FLEGT licensing scheme for imports of timber into the European Community	The EU Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) sets out measures that aim to combat the problem of illegal logging and the associated trade. The Action Plan proposes the development of a Forest Law Enforcement, Governance and Trade licensing scheme (hereinafter referred to as the FLEGT licensing scheme) to ensure that only legally harvested timber is imported from countries participating in the scheme.

## b. Biodiversity

Since trade also impacts global biodiversity, as we have discussed in the previous sections, the EU has biodiversity-related non-trade provisions in its trade agreements, but these provisions are not legally binding and hardly effective. This is partly explained by the complexity of the issues posed by biodiversity: since there is no simple synthetic indicator, policy instruments are difficult to enforce.

However, the EU is committed to revitalizing biodiversity by 2030, with the 'EU Biodiversity Strategy' serving as a central component of the European Green Deal. This strategy, presented in May 2020, outlines several key actions to achieve this goal, including the establishment of protected areas encompassing a minimum of 30% of the EU's land and sea, the restoration of degraded ecosystems, significant reductions in pesticide usage, and the planting of 3 billion trees (see Table 1-3). Furthermore, the EU is actively engaged in the development of a comprehensive global biodiversity framework. EU member states have endorsed these objectives, underscoring the importance of addressing the drivers of biodiversity loss and integrating biodiversity considerations into sectors like agriculture, fisheries, and forestry for a coherent implementation of measures.

For trade policies, non-tariff measures are the main instrument used by the EU to address the negative impacts of trade on biodiversity (in the EU and abroad), the majority of which target regulations in places related to invasive and endangered species.

Inspections are conducted by member states, in the absence of HS methods and volumes, with limited inspection capacities (Margolis et al., 2005) while trade flows are growing. This phenomenon leads to wide heterogeneity in the performance of controls across European countries (Surkov et al., 2008).

*Table 1-3: Select biodiversity related regulations of the EU*

<b>Regulation</b>	<b>Objectives</b>	<b>Details</b>
<b>Regulation 1143/2014</b>	Regarding invasive alien species	This regulation sets the rules to (i) prevent the introduction of invasive species, (ii) detect and rapidly eradicate new species in case the introduction occurs and (iii) manage invasive species that are already widely spread.
<b>Regulation 2022/1203</b>	Updating the list of invasive alien species of Union concern	Regulation amending Implementing Regulation (EU) 2016/1141 to update the list of invasive alien species of Union concern. Earlier updates of similar category: <b>2019/1262, 2018/968, 2018/1454, 2017/1263, 2016/145</b>
<b>Implementing Regulation 2016/1141 and its subsequent updates (final 2019/1262)</b>	Lists the species targeted by these rules	The list gathers 36 plants and 30 animals for which trade, breeding, commercialisation, reproduction and, of course, release in the environment are forbidden, except in some special circumstances and with permission
<b>Council Directive 2000/29/EC</b>	Sets rules to avoid the introduction and spread of organisms harmful to plants or plant products	consignments that could contain harmful organisms are inspected at European borders. In case consignments do not fulfil the criteria set out by the regulation, several measures are applied, from appropriate treatment to quarantine or destruction.

### **c. Corporate Sustainability Due Diligence Directive (CSDDD):**

In March 2021, the European Parliament called on the European Commission to submit a legislative proposal on mandatory value chain due diligence. Before, on 3 December 2020, the Council in its conclusions called on the Commission to present a proposal for an EU legal framework on sustainable corporate governance, including cross-sector corporate due diligence along global value chains. This stems from the fact that sustainability being one of the premier frontiers of the EU value system, companies show a commitment to respecting human rights and to reducing their impact on the planet. Despite this, progress in integrating sustainability, particularly human rights, and environmental due diligence, into corporate governance processes remains slow.

The new due diligence rules will apply to the following companies and sectors:

#### ***EU companies:***

**Group 1:** all EU limited liability companies of substantial size and economic power (with 500+ employees and EUR 150 million+ in net turnover worldwide).

**Group 2:** Other limited liability companies operating in defined high impact sectors, which do not meet both Group 1 thresholds, but have more than 250 employees and a net turnover of EUR 40 million worldwide and more. For these companies, rules will start to apply 2 years later than for group 1.

#### ***Non-EU companies:***

Active in the EU with turnover threshold aligned with Group 1 & 2, generated in EU.

A caveat is that *small and medium enterprises (SMEs)* are not directly in the scope of this proposal. However, small landowners at the end of the supply chain have little agency and leverage and are often held accountable for HR and nature abuses. Smallholder farmers face daily human rights violations while being scapegoats for numerous environmental issues (Euractiv, 2023).

### **d. Carbon Border Adjustments Mechanism (CBAM):**

The Carbon Border Adjustment Mechanism (CBAM) is the EU's landmark tool to put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries. The CBAM is being gradually introduced and begins its transitional phase from 1 Oct 2023. It will initially apply to imports of certain goods and selected precursors whose production is carbon intensive and at most significant risk of carbon leakage: cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen. This is aligned with the phase-out of the allocation of free allowances under the EU Emissions Trading System (ETS) to support the decarbonisation of EU industry. The gradual phasing in of CBAM over time will also allow for an efficient transition for EU and non-EU businesses, and for public authorities. During this period, importers of goods in the scope of the new rules will only have to report greenhouse gas emissions (GHG) embedded in their imports (direct and indirect emissions), without making any financial payments or adjustments. Indirect emissions will be covered after the transitional period for some sectors. With this enlarged scope, CBAM will be fully phased in to capture more than 50 percent of the emissions in ETS covered sectors.

By confirming that a price has been paid for the embedded carbon emissions generated in the production of certain goods imported into the EU, the CBAM will ensure the carbon price of imports is equivalent to the carbon price of domestic production, and that the EU's climate objectives are not undermined.

CBAM is a WTO-compatible measure that encourages global industry to embrace greener and more sustainable technologies (Europa, 2023). In essence, the CBAM is designed to be compatible with WTO rules, including the Most-Favoured-Nation (MFN) Treatment where CBAM measures must not discriminate among WTO member countries but should apply equally to imports from all countries, consistent with the MFN principle, and the National Treatment (NT) where imported and domestic products must be treated equally once they enter a country's market. CBAM should not create unfair advantages or disadvantages for imported goods compared to domestically produced goods.

WTO law admits the border adjustment of both fiscal and non-fiscal measures, but different conditions need to be met based on different provisions. The matter is relevant to the extent that the CBAM is a new, experimental measure and therefore it is not easy to anticipate how it would be characterized under WTO law. The issue boils down as to whether the CBAM would be considered a fiscal measure or a regulatory measure. In the former case, the CBAM could either qualify as a border measure (that is, a duty or any other charge) as per Article II GATT or as an internal tax as per Article III:2 GATT. In the latter case, the CBAM could either fall under Article XI:1 GATT (in the case it was considered a border measure) or as an internal regulation under Article III:4 GATT. The main difference is that, if the CBAM were to be considered a border measure, a violation could be triggered even if the measure is not discriminatory, whereas internal measures could be allowed only insofar as they do not discriminate against foreign products based on the national treatment principle (Holzer, Espa, Cottier, 2023).

Even though the EU Commission resolves its declaration of intent on the European Green Deal and CBAM issues at the Parliament level, it has not made any technical explanation as to how it will harmonize the implementation with WTO Law in practice. In any case, it is also possible that the issue will be resolved at the WTO platform through international negotiations, as there is a dynamism observed towards taking an action on global climate change (Yaman, Business Diplomacy).

### 1.4.3 Associated Risks

The EU faces risks that are associated with the inclusion of environmental clauses in trade treaties. We discuss them below:

#### ***Loss of efficiency:***

Trade policies that are inherently protectionist in nature are what economists term as second-best instruments to deal with environmental concerns. Biodiversity preservation could be handled more effectively by environmental policy than by trade policy. Existing literature has analysed the relative ineffectiveness of trade policy in dealing with biodiversity-related matters. For example, deforestation linked to palm-oil production: A study shows that it is more effective and less costly if Malaysia and Indonesia implement a moratorium on deforestation (targeting deforested areas) together with a limitation on palm-oil production than if the same target in terms of deforested areas is reached with import taxes imposed on palm oil by importing countries (Taheripour et al., 2019). In short, solving environmental problems with trade policy may not be as effective, and ignores the greater trade objectives, i.e., favouring better allocation of resources to promote economic efficiency. Moreover, for GHG as well, it is much more efficient to reduce GHG emissions caused by international transportation of goods using a carbon tax (i.e., integrating international transportation in the Paris Agreement, for instance), than to reduce them by taxing trade flows.

#### ***Paralysis of trade policy:***

The negotiation of trade agreements takes years (e.g., negotiations of the CETA started in 2009 and the agreement was signed in 2016); several negotiations have not been completed

yet (e.g., negotiations with the US started in 2013 and are not concluded so far). Adding environmental conditions to the already cumbersome specifications increases the risks associated with negotiations. The political economy dynamics of the negotiation may change, with actors negatively affected by environmental provisions potentially mobilised against trade negotiations.

#### **Interference:**

The introduction of environmental clauses may lead to a request that the EU trading partners modify several of their public policies, according to approaches or criteria that may not be fully shared. This could come across as interfering in the domestic policy of the partner, or, in other word, a loss of sovereignty.

#### **1.4.4 Related Aspects:**

**Traceability:** The definition of Traceability as per ISO 9000 (ISO, 2000) is: “The ability to trace the history, application or location of that which is under consideration”. For the ISO definitions (ISO 8402, ISO 9000, ISO 22005), there is an additional clause which states that when relating to products, traceability specifically entails “the origin of materials and parts, the processing history, and the distribution and location of the product after delivery” (Olsen and Borit, 2013). Focusing on the cocoa plantation industry, limited access to technology and infrastructure in remote cocoa-growing areas, inadequate resources for monitoring and enforcement, and limited farmer participation in certification schemes create a large and wide issue of traceability. A way that food industries and governments can enhance consumer confidence in food safety is to adopt a traceability system able to track food from ‘farm to fork’ (Zhang, Mankad, and Ariyawardana, 2020). The chocolate industry has used this approach to guarantee the flavour and quality of their products and preserve stakeholder confidence, especially in the context of a growing consumer demand for single origin chocolate and interest in sustainable production (Rottiers et al., 2019). Current cocoa farming practices are causing extensive deforestation, with consequent loss of biodiversity (Wessel and Foluke Quist-Wessel, 2015), and greenhouse emissions from transportation also have negative effects on the environment (Saltini, Akkerman, and Frosch, 2013; Vogel et al. 2020). The economic vulnerability of cocoa-farming households (Vogel et al. 2020) also undermines efforts toward achieving sustainable cocoa production, and poor governance in most of the cocoa-producing regions complicates the guarantee of traceability (Saltini, Akkerman, and Frosch, 2013). Over 55% of cocoa from Ivory Coast is untraceable, either because it is indirectly sourced by traders from local intermediaries, or exported by traders that disclose no information about their suppliers. Some Digital Traceability Tools enable farmers to receive information and advice on best farming practices, as well as access to financial services and market information, either from the government, or by private parties and big Multinational Corporations (Perez et al., 2020).

- 1) **Extensive Margin:** As produced in a big country, it is indeed possible to get more farmers under the wing of the traceability system, expand quality control, and make the supply chain wider.
- 2) **Intensive Margin:** Largely child labour is targeted, along with deforestation, agroforestry (monocropping v/s intercropping), soil health, & tree aging issues for those farmers/cooperatives already in the system.

**Leakage or Spillovers:** A potentially related side effect from the introduction of these traceability systems would be the following positive and negative spillover effects.

- 1) **Positive:** Learning from friends and neighbours would be induced increasingly.
- 2) **Negative:** Displacing deforestation to regions outside the radar would become more rampant.

## 1.5 Transformative pathways towards sustainability in trade

### 1.5.1 Background

Trade and sustainability concerns are intertwined in an increasingly complex challenge of achieving growth while protecting the natural resources that are key to production. This dynamic challenge has sparked a transformation in knowledge systems, ignited discussions about leverage points for change, and raised awareness of the precarious tipping points that could either safeguard our planet's future or push it towards ecological disaster.

#### a. Leverage Points:

The concept of leverage points is illustrated as- places in complex systems where a small shift may lead to fundamental changes in the system (Meadows, 1999). A lot of sustainability interventions so far in place have addressed highly tangible, but essentially weak leverage points (i.e., interventions that are easy to make but have limited potential for transformational change). The current need is to focus on the less obvious, but potentially more powerful areas of intervention (Abson et al., 2017).

From the Meadows, 1999 literature, we can identify the range of leverage points from 'shallow'—places where interventions are relatively easy to implement yet bring about little change to the overall functioning of the system to 'deep'—leverage points that might be more difficult to alter but potentially result in transformational change, across four attributes (from shallowest to deepest): parameters, feedback, design, and intent (see Figure 1-8).

**Parameters** are modifiable, mechanistic characteristics such as taxes, incentives and standards, or physical elements of a system, such as sizes of stocks or rates of material flows. **Feedback** are the interactions between elements within a system of interest that drive internal dynamics (e.g., dampening or reinforcing feedback loops) or provide information regarding desired outcomes (e.g., the effectiveness of a given incentive scheme). **Design** characteristics relate to the structure of information flows, rules, power, and self-organization. Finally, **Intent** characteristics relate to the norms, values and goals embodied within the system of interest and the underpinning paradigms out of which they arise (Abson et al., 2017).

Intent is considered the emergent direction to which a system of interest is oriented. It does not imply that all actors within the system of interest share this end as a normative goal, or that the system itself has a goal points, failing to address issues of design and intent. This is evident in the many policy instruments that focus on simply adjusting parameters, for example, by setting targets or providing financial incentives within existing structures, including carbon pricing, green taxes, targets to increase the extent of protected areas and agri-environment schemes (Abson et al., 2017). Policy interventions that are 'shallow', are thus also exceedingly important and can generate beneficial outcomes but, on their own, are unlikely to lead to transformational change.

#### b. Knowledge Transformation:

The notion of "transforming knowledge systems" represents a significant evolution in the discourse surrounding sustainable transformation and climate change. This concept underscores the critical importance of rethinking, reshaping, and adapting our existing knowledge and information structures to effectively address the challenges posed by environmental sustainability and climate change. It has emerged as a pivotal element in the modern strands of literature on sustainable transformation and climate change.



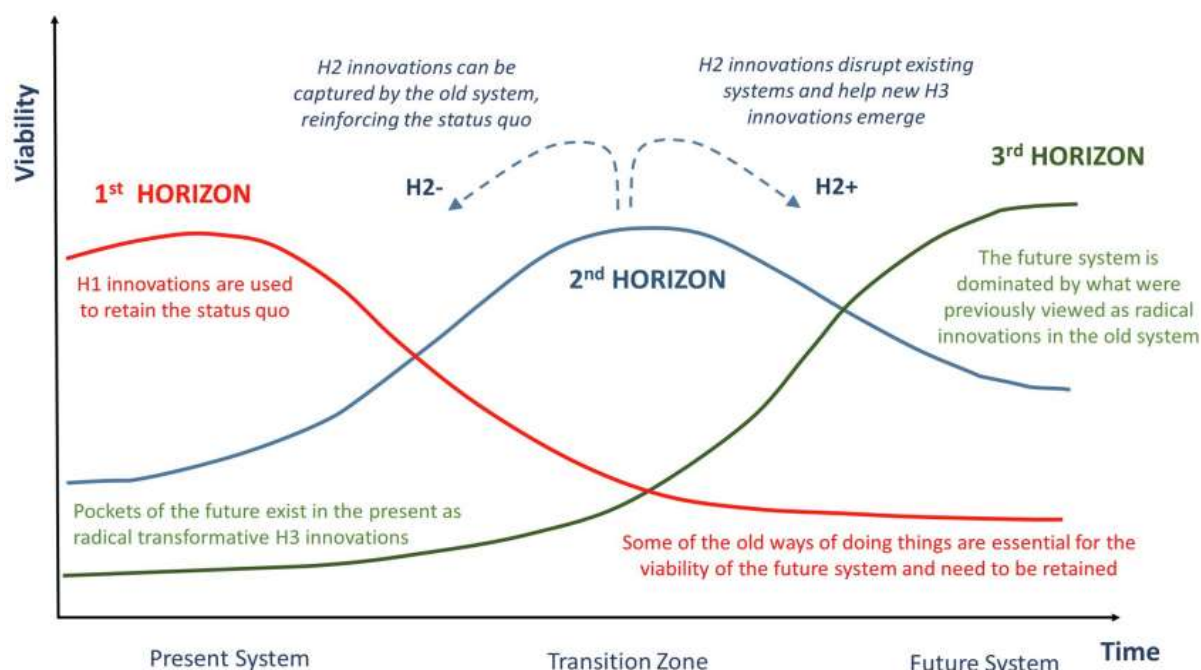


Figure 1-5: The Three Horizons framework is used to convene dialogue about how to achieve transformation. Each horizon represents a combination of ways of doing things (e.g., approach, technology, actions, values, mindsets). (Source: Fazey et al., 2020)

Fazey et al., 2020, suggests that envisioned future systems will need to be much more collaborative, open, diverse, egalitarian, and able to work with values and systemic issues. To get to envisioned systems, it is of utmost importance to rapidly scale methodological innovations, connect innovators, and creatively accelerate learning about working with intractable challenges. It is also imperative that new funding schemes are created and deeply held assumptions are challenged. The viability of these ways changes over time as surrounding conditions changes, with the third horizon dominated system eventually emerging as more viable. The framework (as depicted by Figure 1-5) helps to identify: (1) Challenges that dominate the present that inhibit progress towards a more viable way of doing things (Horizon 1); (2) Features of a desired future systems (Horizon 3) and the innovations needed for new systems to emerge (Horizon 2). For the latter, distinctions are made between innovations that help create forward momentum (H2+) and those likely to be captured by existing systems and which can reinforce the status quo (H2-). This framework is not merely a theory, but rather seeks to support the practice of identifying pathways for system change (see Figure 1-5).

### c. Tipping Points:

The notion of tipping points is related to the idea of small interventions with large system effects and is closely linked with the postulation of leverage points. By definition, a tipping point is where a small intervention leads to large and long-term consequences for the evolution of a complex system, profoundly altering its mode of operation (Gladwell, 2000; Lenton et al., 2008). Such non-linear response is usually self-propelling and hard to reverse. Tipping points can interact across systems, spatial and temporal scales (Lenton, 2020). The occurrence is almost always supported by the presence of strongly reinforcing positive feedback within a system, which can amplify a small initial change and turn it into a large consequence. Transforming towards global sustainability requires an intense acceleration of social change, for which, there is a growing interest in finding 'positive tipping points' at which small interventions can trigger self-reinforcing feedback that accelerate systemic change (Lenton et al., 2022). Given the complexity of systems in which positive social tipping may occur, they are emergent and difficult to predict. However, it is suggested that by creating enabling

conditions and the right mix of policy and interventions, we can trigger positive tipping points (See Figure 1-6 and Figure 1-7).

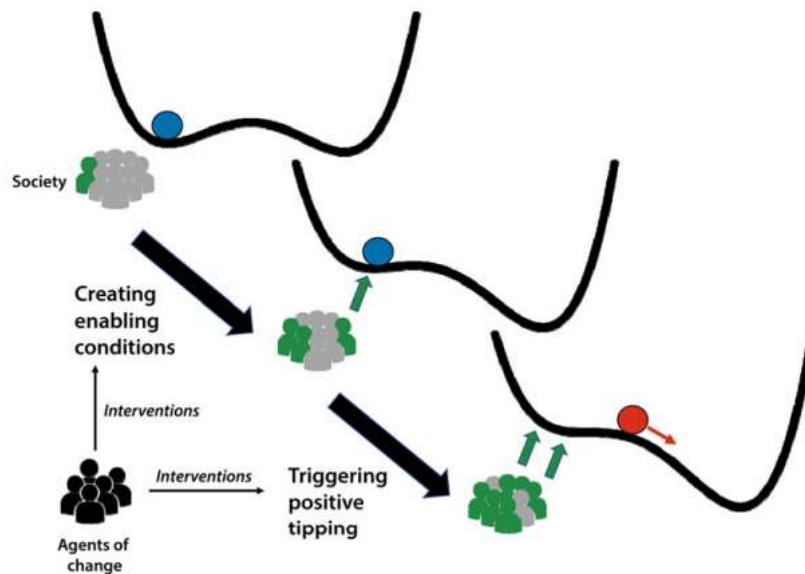


Figure 1-6: A dynamical systems conceptualization of positive tipping points (Source: Lenton et al., 2022)

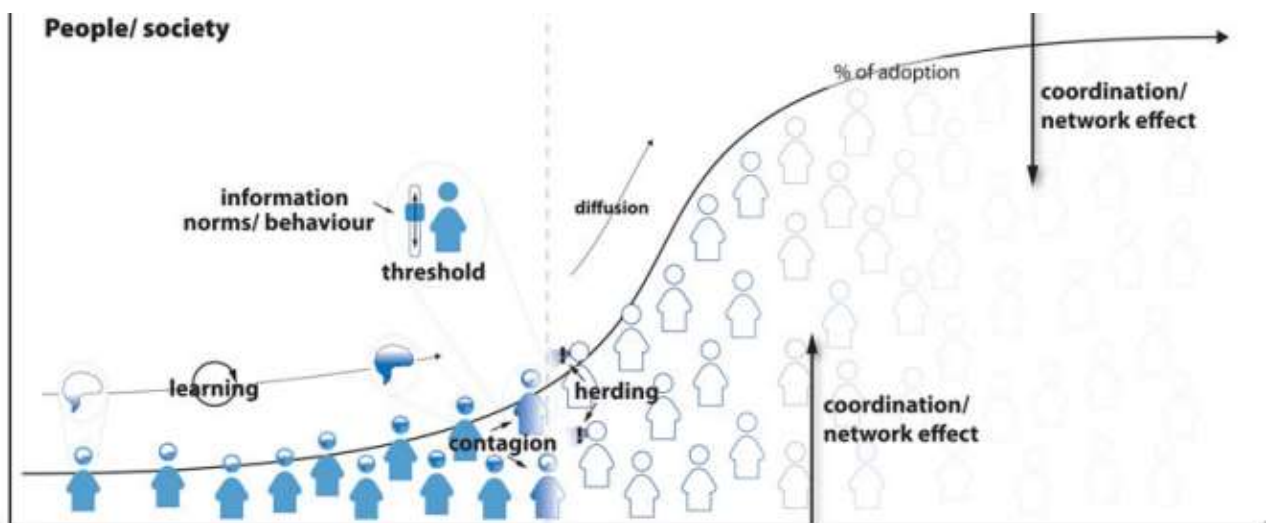


Figure 1-7: Schematic synthesis of human interactions that can underlie positive tipping points across social-technological-ecological systems (Source: Lenton et al., 2022)

## 1.5.2 Trade-related policy entry points: Contribution to the growing literature through interventions:

### a. Leverage Points

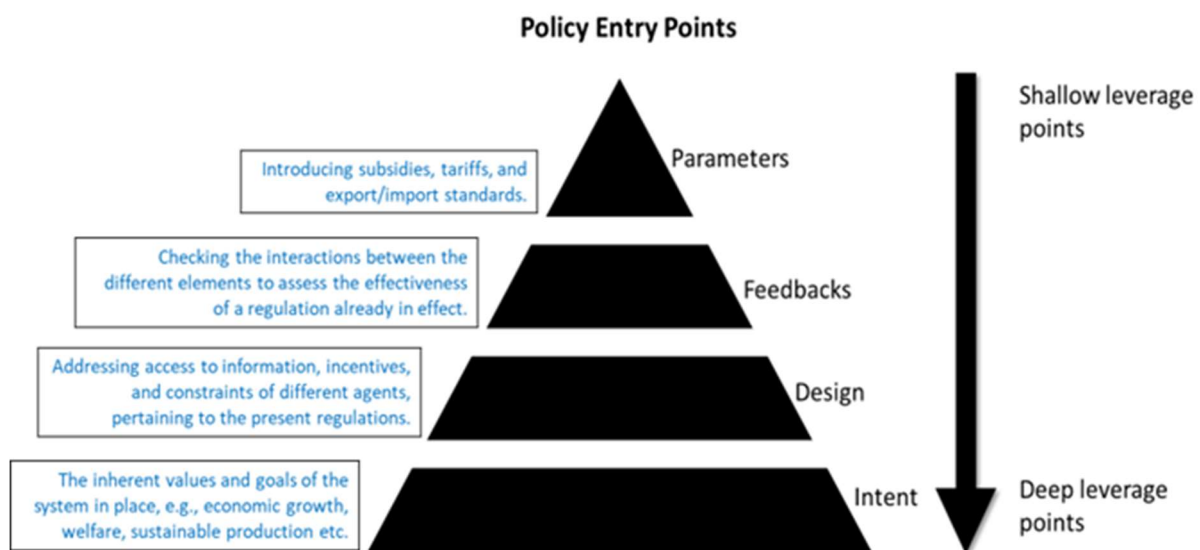


Figure 1-8: Leverage point triangle for trade-related interventions (inspired by Abson, 2017)

Through in-depth research we have pinned down certain points of intervention which could promote sustainability in these production practices and help international trade in an environment friendly manner. Within this, we contend that to achieve meaningful change in terms of sustainability and biodiversity conservation, we need to layer a range of different entry points from shallow to deep across time. We thus place the identified leverage points under categories (see Figure 1-8) with a view to layering them through time:

#### **Market power leverage (e.g., CBAM, zero deforestation) → Parameters**

Market power leverage mechanisms, such as the Carbon Border Adjustment Mechanism (CBAM) and zero deforestation commitments, often involve setting specific parameters, including taxes, incentives, and standards. Subsidies, although not very transformative in themselves by nature, may be essentially vital in a pathway towards transformative change, because of their property to de-risk the transition in the receiving environment. These mechanisms adjust the measurable aspects of the trading system to promote more sustainable outcomes.

#### **Traceability → Feedbacks**

Traceability in trade refers to the ability to track the origin and journey of products through the supply chain. This can be linked to Feedback as it involves understanding and managing the interactions and flows within the system. Effective traceability systems can provide feedback on where potential issues in the supply chain exist, helping to identify areas for improvement and reduce negative impacts on biodiversity.

#### **Certification → Design**

Certification processes in trade are part of the design characteristics of a system. They involve the establishment of rules, standards, and information flows that govern how products are produced and traded. Certification schemes are, in essence, a structural

aspect of how the system operates and can be modified to encourage more sustainable practices, through the structure and organization of the Design pillar.

### ***Production techniques → Intent***

Production techniques are intimately linked to the intent of a system. The methods and technologies used in production reflect the goals and values embedded in the system. Shifting production techniques toward more sustainable and environmentally friendly practices is a way to align the system's intent with broader sustainability goals in a manner that is aligned with the long-term vision as well. This fundamentally speaks about phasing in biodiversity-positive practices and phasing out biodiversity-harmful activities, the explicit intent being more biodiversity-positive. This also stands for removing age-old harmful practices that do not fit this box.

#### **b. Knowledge Transformation**

According to this framework, the identified trade interventions for sustainability should span over the second and the third horizons. From certification methods that should target the transition zone to the digital tools for traceability that are radical innovations and lead to the future system, these proposed interventions will help in overriding the present system at place.

#### **c. Tipping Points**

Following up on the conversation about the intervention in the Cocoa production sector, we see close resemblance with the idea of ensuring traceability through digital tracking tools as one of the beneficial tipping points interventions to ensure sustainable change. Having digitization of manual methods and introducing modern technological interventions may help pave the way for sustainable transformation through human coordination and network effects, as well as inculcating providing individual incentives to adopt and transform. Hence, tipping point literature. The notion of tipping interventions to catalyse tipping points is therefore strongly aligned to identifying leverage points and acts as a lever in the context of trade. In future work, we will as well, and we base our mediation of the following deliverable that entails an experiment with this concept in the context of policy mixes and interventions for trade, on such new and wide scopes of sustainable development.

## **1.6 Benefits and Drawbacks of Regulatory Laws**

In this section, we delve into trade regulations, examining how their identification and subsequent handling can yield both positive and potentially adverse outcomes. These critical junctures, often characterized by their sensitivity to changes in policy and practice, possess the power to shape the trajectory of trade-related activities in different ways.

In the context of US and Mexico, the effect of a tightening of the US air quality standard for lead in 2009 had a role to play on the relocation of battery recycling to Mexico and consequently on infant health in Mexico. In the US, airborne lead dropped sharply near affected plants, most of which were battery-recycling plants, but exports of used batteries to Mexico rose markedly. On the other hand, in Mexico, production increased at battery-recycling plants relative to comparable industries, and birth outcomes deteriorated within two miles of those plants relative to areas slightly farther away. The case provides a salient example of a pollution-haven effect between a developed and a developing country (Tanaka et al., 2022). This scenario underscores several key aspects, including the concept of unequal exchange theory and the recognition that trade regulations alone may not be sufficient to address such multifaceted challenges. When there is heterogeneity in standards, trade regulations in

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isolation may actually promote negative or ambiguous direction of tipping points, one of which is a classic example through this case.

Another example is from the eastern Democratic Republic of the Congo (DRC), to examine the consequences of a US legislation, the “conflict minerals” section of the 2010 Dodd-Frank Act. In DRC, it cut funding to warlords by discouraging manufacturers from sourcing tin, tungsten, and tantalum from the region. Evidence from georeferenced data shows that the legislation increased looting of civilians and shifted militia battles toward unregulated gold-mining territories. Accordingly, these findings act as a cautionary tale about the possible unintended consequences of imposing boycotts, trade embargoes, and resource certification schemes on war-torn regions, especially feeding the widespread belief that civil conflict in poorly governed countries is triggered by surging international demand for their natural resources with an example where the legislation backfired, inciting violence (Parker and Vadheim, 2016).

Regulations without adequate attention to the receiving implementing environment can result at best in the lack of uptake or political backlash, and at worst in reinforcing inequities. Thus, regulations intended for transformative change that incite other negative externalities on human welfare must thus be looked at through fresh lens, and leverage points must be adopted in a way that are deep, thus serving all forms of sustainable change, including economic welfare. However, trade regulations in isolation might not fetch the desired effects and might be very far away from their objectives. This underscores the necessity for international cooperation and harmonization of standards to ensure that trade decisions contribute positively to global sustainability and do not inadvertently push us towards precarious tipping points.

Ambitious EU regulations are a key lever for transformative change in trade, but they cannot be done without deep engagement and deliberation with the receiving implementation environment (abroad or with EU Member States). In this deliberation, the regulations need to be coupled with co-created and negotiated incentives to de-risk the transition in the receiving environment and ensure that the regulations do not put an unfair burden on commonly marginalized groups. This is the fundamental point where trade and finance intersect, and taking stock of that, we smoothly transition to our next chapter, focusing on finance.

## Chapter 2: Pathways towards a nature positive financial sector

### 2.1 Introduction

The financial sector refers to the industry that provides financial services to individuals, businesses and governments. It includes a wide range of institutions, such as banks, insurance companies, investment firms and stock exchanges. The financial sector plays a crucial role in the economy by facilitating the allocation of capital, managing risk and providing liquidity. Its cross-sectoral reach, its ability to channel large amounts of capital over time and space, its potential to manage (environmental) risks and its ability to transmit information between economic agents via price signals all makes the financial sector a strategic sector to target in the transition to a nature-positive economic system.

However, to date the financial sector falls short of these objectives. As a large proportion of money circulating through it does so with limited consideration on its impact on nature, the financial sectors continues to fuel activities that are harmful to biodiversity and climate stability (Galaz et al., 2018; Global Canopy, 2022; RA Network, 2023). In addition, it has been argued that the lack of sound regulatory framework in the financial sector, and the associated increase in the role of financial actors, has meant that markets and motives in the economy and society have contributed to neglecting social and environmental objectives and encouraging the development of extractive and unsustainable modes of production. (Clapp & Isakson, 2018; Clark & Hermele, 2013; Mazzucato, 2018).

In this chapter, we aim to gain more insights on how to turn the financial sector into a support structure for an economy that is positive for people and nature, and to identify policy leverage points to do so. We begin by presenting the financial sector and its role in the economy. In Section 3, we present the interaction between the financial sector and nature: the way financial sector affects – and is affected by – nature, the challenges/opportunities sustainability poses to finance and the latest (policy) developments in terms of sustainable finance. In Section 4, going beyond seeing finance as a *sector*, we adopt a system thinking perspective and present finance as a complex adaptive system that interacts with, and is part of, larger and even more complex social-ecological systems. Building on Abson and colleagues (2017), we show that the financial system is shaped by parameters, feedback, design and intents elements that operate at different levels of depth in the system. When targeted by policy interventions, these elements can lead to various potential level of transformative change. Our view is then synthesized in an analytical framework that we use in Section 5 to identify policy entry-points we deem promising to bring about positive transformative change in the financial sector.

### 2.2 The financial sector and its role in the economy

**The financial sector can be defined as the combination of intermediaries, markets and institutional infrastructure that manage the circulation of financial capital between economic agents.** Intermediaries are financial institutions such as banks, institutional investors or pension funds that engage directly with economic agents (governments, firms and households) and provide them with a range of financial services including deposit, credit, investment or insurance services. Markets are (virtual) places where different financial assets are traded. These assets may be shares, securities, currencies, commodities or derivative contracts. Finally, the infrastructure of the financial sector can be defined as all the elements that govern and facilitate intermediaries and markets operations. Infrastructure elements include stock exchanges, payment and settlement systems, mechanisms to ensure contractual security, credit ratings, accounting and auditing standards, and regulatory and supervisory framework (Crockett, 2011).

**When interrogating what societal function does the financial sector fulfils three elements are generally put forwards:**

- **The financial sector plays the role of connecting the demand and supply of financial capital in the economy.** Capital demand stems from issuers; i.e. companies or governments seeking funds to develop their economic activities. Capital supply comes from investors; i.e. individuals, governments, companies or pension/investment funds wishing to put their money at work. Financial capital is typically provided in form debt – fixed income assets inducing regular interest payments – or equities – companies’ shares opening right to dividends and sometimes voting in corporate governance decisions.
- **The financial sector provides a platform for actors to trade existing assets in secondary markets.** As specified above, such assets can consist in bonds, shares, but also commodities or foreign currencies. In theory, the trading of financial assets contributes to ‘efficient’ price formation by sending informational signals to investors, helping them to direct capital towards the most productive/profitable activities.
- **The financial sector plays a role in risk management.** Financial markets allow investors to hedge against specific risks by diversifying their portfolios or by using financial instruments (usually derivatives) to transfer the risk to another market player willing to take it on. Specialized intermediaries (insurance companies) also contribute to risk management by pooling the risks of different market players into a larger portfolio and charging a risk premium to generate profits and cover their potential loss.

Following Crockett’s (2011) analogy, the financial sector can be seen as the ‘*central nervous system of a market economy*’. It contributes to the creation of economic value by enabling maturity transformation, better information in asset price discovery and risk hedging, all of which is supposed to allow for a more ‘efficient’ allocation of capital.

**The financial sector is not neutral player in the economy. It operates within a specific political and ideological framework that has wider consequences for the socio-economic landscape.** The allegedly efficient allocation of capital by financial markets is largely based on theoretical foundations derived from neoclassical economics. The hypothesis of market efficiency (Fama, 1970) and the shareholder value theory - which presents the maximization of shareholder returns as the primary purpose of companies (Friedman, 1970) - are two key elements of this theoretical framework. This view tends to emphasize financial market self-regulation, pointing out concerns about the potentially distorting effect that excessive public intervention can have on price revealing mechanisms. However, the financial crisis of 2008 showed that the lack of regulation and public safeguards in the financial sector can lead to excessive risk-taking on the part of financial players, jeopardizing the stability of the global financial system. Critics have further opine that unmonitored growth of the financial sector (in terms of balance sheet) encouraged disconnection between financial activity and real economy (Loorbach et al., 2020), leading to rising income and wealth inequality (Piketty, 2014; Vries, 2019) and generating costs for non-financial stakeholders and sometimes for society as a whole (Mazzucato, 2018; Schoenmaker, 2018).

**The impact of the financial sector on the economy also stems from the influence channel it opens for capital providers on business operations and their time horizons.** In the case of debt financing (i.e. loans and bonds), capital providers’ influence may take the form of conditional finance (e.g. sustainability loans or green bonds). In the case of equity financing, influence is exerted through shareholder voting rights or more informal channels of engagement with management (e.g. private discussions, open criticism in the press, threats of divestment, ...). Equity financing is generally more closely linked to corporate governance, as it involves a more direct channel of influence. Equity investments are often made through institutional investors, who manage large portfolios of assets on behalf of other investors. Thanks to their high volume of assets under management, these institutional players can sometimes have a significant influence on market trends and corporates decisions. It should be noted, however, that institutional investors differ in terms of interest and strategy, and

therefore have different risk and return preferences, time horizons and degree of involvement in corporate governance (i.e. "activism"). Table 2-1 below provides an overview of four of the main types of institutional investors, the total value of assets they manage worldwide and related characteristics in terms of risk-return profile, time horizon and level of involvement in corporate governance. As can be seen, pension funds have by far the largest volume of assets under management and have relatively long time horizons. They may therefore be strategic actors to engage with while aligning financial flows to environmental and social challenges.

Table 2-1: overview of four of the main types of institutional investors

Type of institutional investor	Description	Total value of assets managed worldwide	Characteristics
<b>Sovereign wealth funds</b>	A sovereign wealth fund (SWF) is a state-owned investment pool that manages a nation's financial reserves, often derived from commodities or foreign exchange earnings. SWFs aim to diversify investments, stabilize budgets, accumulate wealth, and promote economic development while under government ownership and control.	11.5 trillion U.S. dollars (2023) <sup>6</sup>	<b>Risk-return profile:</b> low to high <b>Time horizon:</b> long  <b>Level of activism:</b> low to medium
<b>Pension funds</b>	A pension fund is a type of investment fund that is set up to provide income to individuals during retirement. It pools contributions from employees and employers and invests those funds to grow them over time.	60.6 trillion U.S. dollars (2021) <sup>7</sup>	<b>Risk-return profile:</b> low <b>Time horizon:</b> long <b>Level of activism:</b> medium
<b>Private equity funds</b>	Private equity funds are investment vehicles that raise capital from institutional and high-net-worth investors to acquire equity ownership in privately held companies. These funds typically target businesses with strong growth potential and work closely with management to improve their operations and drive financial returns.	11.7 trillion U.S. dollars (2022) <sup>8</sup>	<b>Risk-return profile:</b> high <b>Time horizon:</b> medium <b>Level of activism:</b> high
<b>Hedge funds</b>	Hedge funds are investment partnerships that pool funds from accredited investors and invest them using various strategies. They aim to generate high returns by taking advantage of market inefficiencies, employing leverage, and implementing complex investment strategies such as short-selling, options, and derivatives. Hedge funds often have high investment minimums and may use aggressive risk management techniques.	4.53 trillion U.S. dollars (2021) <sup>9</sup>	<b>Risk-return profile:</b> high <b>Time horizon:</b> short to medium <b>Level of activism:</b> low

<sup>6</sup> Source: Megginson et al. (2023)

<sup>7</sup> Source: OECD (2022)

<sup>8</sup> Source: McKinsey (2023)

<sup>9</sup> Source: BarclayHedge (n.d.)



**The nature and extent of the financial sector's influence on the economy are determined by a set of 'rules of the game' embodied in a wide range of standards, conventions and regulations.** These rules provide a common framework within which financial institutions operate. They fulfil a number of functions, including ensuring transparency, preventing abuse and fraud, and guaranteeing a certain level of standardization in order to reduce operational costs and increase the frequency of transactions. In some cases, these rules have been developed and adopted iteratively by industry players on a voluntary basis, before gradually establishing themselves as general standards, or even being made mandatory by public bodies. This is the case, for example, with the International Financial Reporting Standards (IFRS) (Pope & McLeay, 2011). In other cases, such as prudential policies, the rules are imposed by a regulator and implemented by supervisory bodies as part of their mandate. These rules and standards evolve in response to changing economic conditions, technological advances and the lessons learned from past financial crises. They greatly contribute to shaping the relationship between the financial sector and the wider economy in at least two ways:

- **First, the rules, norms and standards in force in the financial sector reflect and shape the preferences and practices of market players.** For instance, reporting frameworks used by financial and non-financial companies, reveal broader worldviews and reflect what is valued in a society at a given time (Boissinot et al., 2022). They have thus constantly evolved, shaping and reflecting the wider socio-economic landscape (Colasse & Déjean, 2022). A branch of the literature has notably highlighted the way in which financial reporting standards can influence investor preferences and corporate activities. While the combined effect of corporate performance indicators, executive compensation schemes and the frequency of financial reporting can lead to perverse incentives and foster short-termism in corporate governance (Gigler et al., 2014; Jackson & Petraki, 2011), the integration of Environmental, Social and Governance (ESG) criteria or environmental/social impact metrics can incorporate sustainability concerns into investor preferences or fill up data gap for the implementation of future policies.
- **Secondly, rules, norms and regulations in the financial sector contributes to defining the role and duties of financial institutions, determining the issues for which they can or cannot be held accountable.** For example, the proliferation of macroprudential policies and supervisory bodies in the wake of the 2008 financial crisis marks recognition of the responsibility of (large) private financial institutions for the stability of the global financial system. In the same vein, the question of whether financial players should be held (legally) responsible for the social and environmental impact of the activity they finance (or insure) is increasingly being raised. While regulations on money laundering and terrorist financing are currently in place in the EU (Table 2-2), the legal responsibility of financial institutions for the environmental impact of their customers is still under debate (see for e.g. Simon et al., 2023).

In the context of financial policies, Vitta (1992) proposes a typology of regulation based on their related objectives. This typology, as well as related example of regulations/directives in the context of EU financial regulatory framework are presented in Table 2-2 below.

*Table 2-2: Types of financial regulations and related examples in the EU context.*

<b>Types of financial regulations</b>	<b>Description</b>	<b>Examples in EU context</b>
<b>Macroeconomic controls</b>	To maintain overall control over the level of aggregate economic activity and contain major internal and external imbalances (reserve	<a href="#">Regulation (EU) 1176/2011</a> on the prevention and correction of macroeconomic imbalances sets out the

	requirements, direct credit and deposit ceilings, interest rate controls, and restrictions on foreign investments)	MIP procedure and applies to all EU countries covered by the MIP <a href="#">Regulation (EU) 1174/2011</a> on enforcement measures to correct excessive macroeconomic imbalances specifies a sanction mechanism to enforce MIP recommendations for euro area countries <a href="#">Directive 2015/849</a> - Prevention of the use of the financial system for the purposes of money laundering or terrorist financing.
<b>Allocative controls</b>	To control the structure of the financial system (entry and merger controls, geographic restrictions, and limits on the range of activities of different types of financial institutions).	
<b>Prudential controls</b>	To preserve the safety and soundness of individual financial institutions and sustain public confidence in the stability of the financial system as a whole (authorization criteria, minimum capital requirements, limits on the concentration of risks, and reporting requirements).	<a href="#">Directive 2013/36</a> on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms <a href="#">Regulation (EU) 575/2013</a> on prudential requirements for credit institutions and investment firms <sup>10</sup>
<b>Organizational controls</b>	To ensure the smooth functioning and integrity of financial markets and information exchanges (rules of market-making and participation, disclosure of market information, and minimum technical standards);	<a href="#">Regulation (EC) 1606/2002</a> on international accounting standards.
<b>Protective controls</b>	Provide adequate protection to users of financial services, especially consumers and nonprofessional investors (information disclosure to consumers, compensation funds, and ombudsmen offices to investigate and resolve disputes).	<a href="#">Regulation (EU) 596/2014</a> on market abuse <a href="#">Directive 2014/65</a> on markets in financial instruments

Note: Typology of financial regulation and description (columns 1 and 2) are derived from (Vittas, 1992)

**In conclusion, the financial sector plays a central role in the economy, not only as a channel for transmitting capital and risks between economic players, but also by structuring economic activity and market relations.** As such, its role is not neutral and the way it is governed has a direct impact on the economy and society. In this respect, some of the (root) causes of major societal problems have been (arguably) attributed to elements of the financial sector. Examples include childhood obesity (Wiek & Weber, 2014), food insecurity (Clapp & Isakson, 2018; De Schutter, 2010) and, as we will see in the next section, environmental degradation and climate change.

## 2.3 The interactions between finance and nature

### 2.3.1 The impact and dependence of the financial sector on nature

**The financial sector acts as the capital and risk distribution belt of the economy. Its health and stability are therefore inextricably linked to macroeconomic conditions,**

<sup>10</sup> Capital Requirements Directive (CRD) and regulation (CRR) are the EU's regulatory responses to Basel III, aiming to harmonize banking regulations across EU member states with the international standards set by the Basel Committee.

which in turn are highly dependent on well-functioning natural ecosystems. The degradation of natural ecosystems disrupts the provision of essential ecosystem services, such as the freshwater cycle, pollination or soil fertility. Moreover, phenomena such as pollution, climate change and the spread of invasive species generate economic loss to businesses through capital destruction, supply chain disruption or commodity price volatility. Companies are also exposed to transition risk – i.e. when, in response to the threat of environmental degradation, changes occur in regulations, consumer preferences or technologies, generating compliance/adaptation costs or stranded assets for unprepared businesses. These physical and transition risks can affect the economy at the micro, regional/sectoral, and macro level. They translate into financial risk by restricting companies' (re)financing capacity (market and liquidity risks), or by limiting their ability to comply with their current financial obligations (credit risks). It should be noted that financial institutions are not only exposed to environmental risks through their customers. They are also, in the same way as other businesses, directly exposed to these risks, and in particular to the transition risk, which can translate into legal, liability or reputational risks (PBL, 2020). Figure 2-1 below illustrates the different channels through which nature degradation can translate into economic and financial risks.

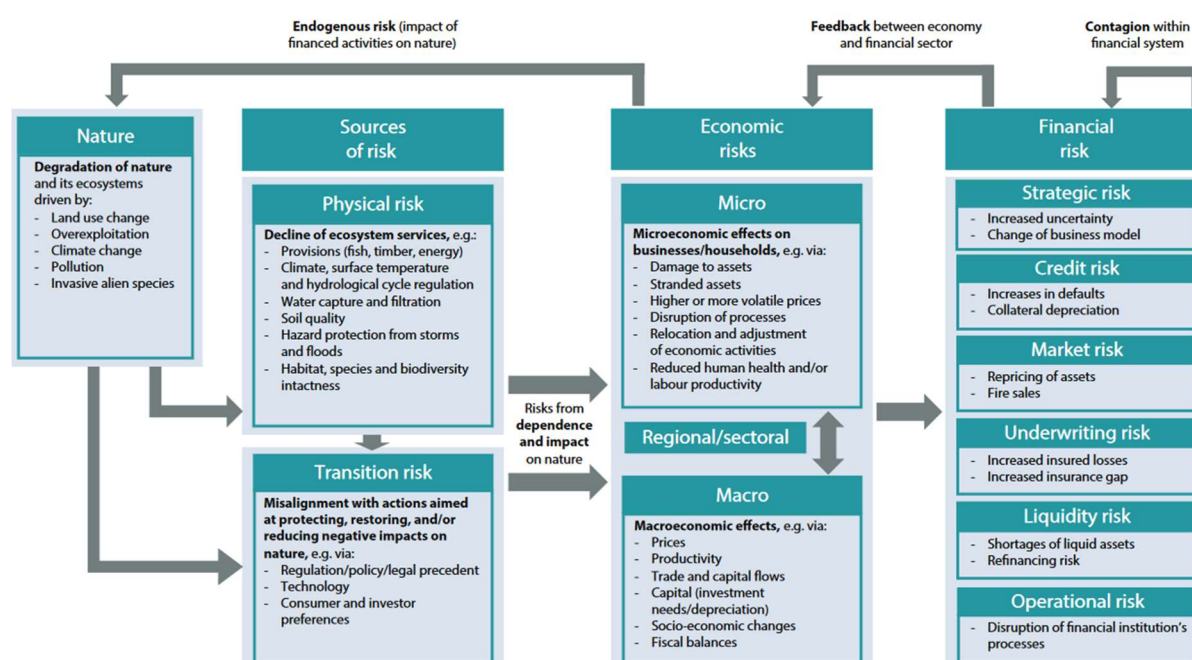


Figure 2-1: From biodiversity to financial risks. source: (PBL, 2020)

**Although ecosystem services are necessary for the functioning of the entire economy, and therefore of the financial system, direct exposure to nature-related financial risks varies across regions and sectors.** Cocoa cultivation, for instance, can be considered as highly dependent on ecosystem services as it relies at more than 90 percent on animal pollination (Klein et al., 2006). This has direct economic and social implications as cocoa is a strategic commodity for several countries, and in particular Cote d'Ivoire where cocoa accounts for up to 20 percent of the countries' GDP, more than 40 percent of its earning for exports, and generates more than 10 percent of its public revenue (UNSDG, 2022). Decrease in pollinator population – as it is already observed due to intensive use of pesticide and invasion of alien species (Claus et al., 2018) – may have dramatic impact of crop yields, and in turn worsen the already precarious livelihood of the significant share of the population that dependent on this resource.

**Local exposure to nature-related risk can have repercussions at a systemic level.** Interconnected ecosystems, globalized supply chains and contagion through financial systems exacerbate interdependence between distant economic agents (Liu et al., 2018) and increases the likelihood of system-wide risk propagation (Bolton et al., 2020; Kedward et al., 2022; Svartzman, Bolton, et al., 2021). While these risks remain challenging to assess quantitatively (see Subsection 2.2.3), their importance for global financial stability is a source of growing concern for market participants and observers (NGFS, 2022). A series of studies have recently highlighted the high extend to which financial sectors at national and regional levels are exposed to nature-related financial risks. The results suggest that between 40% and 70% of assets held by financial institutions in studied areas relate to sectors that are highly dependent on at least one ecosystem service (see Table 2-3). The systemic aspect of nature-related risks calls for an approach that goes beyond incentivizing economic players to deal with these risks "for their own good". It gives a mandate to financial regulators and supervisors to integrate nature-related financial risk considerations into their macroprudential policy framework (Chenet et al., 2021a; Cullen, 2018; Kedward et al., 2020).

*Table 2-3: National/regional estimation of financial dependency on nature<sup>11</sup>*

Area	Results	References
Brazil	46% of Brazilian banks' non-financial corporate loan portfolio is concentrated in sectors highly or very highly dependent on one or more ecosystem services	(Calice et al., 2021)
France	42% of the value of securities held by French financial institutions are highly or very highly dependent on at least one ecosystem service.	(Svartzman, Espagne, et al., 2021)
The Netherlands	Around 36% of investment in Dutch financial sector are highly dependent on one or more ecosystem services.	(PBL, 2020)
Malaysia	54 % of loan portfolio is exposed to sectors that depend to a high extent on ecosystem services.	(World Bank & Bank Negara Malaysia, 2022)
Eurozone	75% of all bank loans in the euro area are to companies that are highly dependent on at least one ecosystem service.	(Elderson, 2023)

**Financial entities are not only exposed to nature-related risks, but also impacts upon it, making nature-related risk endogenous to the financial sector.** As the main channel for capital allocation, the financial sector plays a crucial role in determining the projects and technologies that shape (and will shape) our economy. Yet, the vast majority of capital currently circulating on financial markets does so with too little or no regard for its potential impact on the environment (Urban & Wójcik, 2019). As a result, mainstream finance continues, to a large extent, to finance activities that harm the climate and nature. For instance, a recent study by (Global Canopy, 2022) showed the systematic lack of anti-deforestation policies from the financial actors most involved in the supply chain of commodities at high risk of deforestation. As mainstream finance continues to fuel nature-damaging business-as-usual (BAU) economic activities, it increases the risk of negative cascading effects and self-

<sup>11</sup> The estimates presented in this table are likely to vary not only according to the areas studied, but also according to the methodology used in each study. The aim here, therefore, is not to compare figures and show inter-regional variations in exposure to nature-related risks, but rather to highlight the overall magnitude of exposure these figures depict.

reinforcing feedback loops between macroeconomic deterioration and financial risk (see figure 2-2 below). Hence, a double materiality perspective – that considers both financial institution vulnerability to nature-related risk (“financial materiality”) and their contribution in increasing such risks (“environmental materiality”) – is essential in assessing the interactions between financial actors and natural ecosystems (Boissinot et al., 2022).

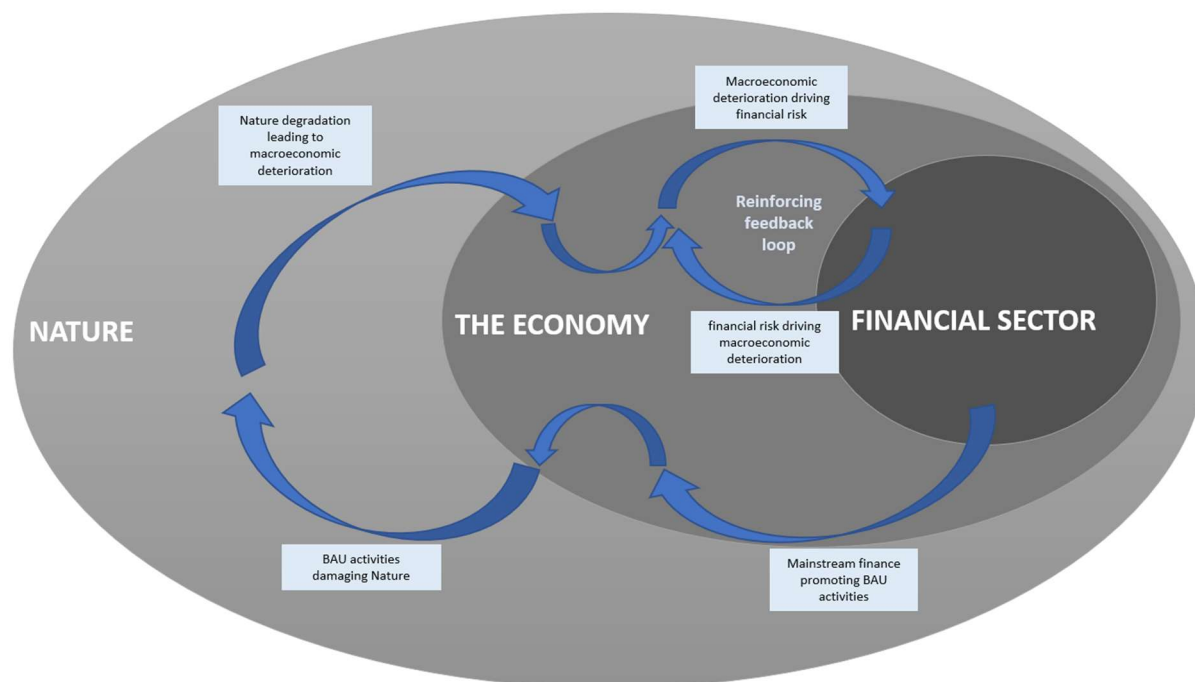


Figure 2-2: Mainstream finance and business-as-usual (BAU) activities are driving nature degradation, jeopardizing the economy and the financial sector stability (source: own elaboration)

**The negative impact of the financial sector on nature is not limited to the provision of capital to nature-damaging activities, but may also occur due to increasing financialization that reinforce unsustainable and/or inequitable practices.** Some have argued that the growing role that financial actors, markets and motives have taken in economy and society in recent decades has created the structural conditions for the emergence and promotion of environmentally and socially unsustainable modes of production (Clark & Hermele, 2013). As Clapp and Isakson (2018) point out, this is particularly observable in food systems. Food system financialization has contributed in natural resources commodification by allowing speculative practices in the agricultural commodity markets (De Schutter, 2010) and by encouraging the acquisition of farmland as a new class of financial assets (Kedward & Ryan-Collins, Josh, 2022; Ouma, 2020). The growing attraction of large equity funds for agricultural firms promoted horizontal and vertical integration of the agri-food industry (Howard, 2016), contributing to market concentration and reinforcing the lock-in of investments in intensive, large-scale and input-intensive agricultural activities (Clapp & Isakson, 2018). Excessive financialization also contributed to conveying the shareholder value paradigm in corporate governance, which aims to maximize (short-term) financial return as the "raison d'être" of the companies. This has hampered the voice of other stakeholders, contributing to neglecting other non-financial motives (Lazonick & O'Sullivan, 2000), such as (long-term) social and environmental outcomes.

### 2.3.2 The challenges posed by sustainability to the financial sector

**Nature-related risks are technically hard to address because of three main reasons: (1) they are subject to complex risk transmission channels, (2) they are potentially systemic and (3) they are endogenous.** The earth system is characterized by complex interactions, non-linear properties and tipping points (Lenton, 2013; Steffen et al., 2018). Environmental issues such as climate change, water pollution and biodiversity loss are not

independent phenomena, but interdependent processes that interact and amplify each other. As a result, far reaching and hard-to-untangle risk transmission channels occur, making risk hard (if not impossible) to quantify. Complexity is exacerbated in our globalized economy, characterized by global supply chain, telecoupling, and high financial interconnectivity. This increases interdependencies between distant economic agents (Liu et al., 2018) and increases likelihood of system-wide risk propagation (Bolton et al., 2020; Kedward et al., 2022; Svartzman, Bolton, et al., 2021). Moreover, as explained above, nature-related risks are endogenous to the financial sector, as financing activities are not only affected by these risks, but can also contribute to their aggravation by financing activities that are detrimental to the well-functioning of ecosystems. (NGFS, 2022). This further contributes to spiral and amplification effects (Crona et al., 2021; Galaz et al., 2018).

**The traditional risk management approaches used by financial actors are ill-suited to these new types of risk, which are better incorporated through forward-looking approaches such as scenario analysis and stress testing.** Traditional risk management tools are calibrated on historical data, making them blind to rapidly changing and unpredictable events (Chenet et al., 2021a; Svartzman, Bolton, et al., 2021). Moreover, because natural risks are endogenous, potentially systemic, and neglected by traditional risk measurement tools, they increase the level of correlation between the different financial assets' value. This undermines conventional risk hedging strategies based on investment diversification (Crona et al., 2021; Hawley & Lukomnik, 2018). Recently, new risk management tools have started to emerge and are increasingly used by financial institutions and supervisory bodies to address the complexity surrounding nature-related risks. Such tools essentially rely on forward looking approaches, using scenario analysis and stress testing. Although they can help the financial sector to better adapt to environmental risks, the potential of these tools remains limited in the presence of radical uncertainty (Chenet et al., 2021a). It has thus been argued that they should be complemented by a precautionary approach to (macroprudential) financial policy, departing from the objective of 'efficient' price discovery, and focusing instead on the avoidance of potentially catastrophic and irreversible nature-related risks (Chenet et al., 2021b; Kedward et al., 2022).

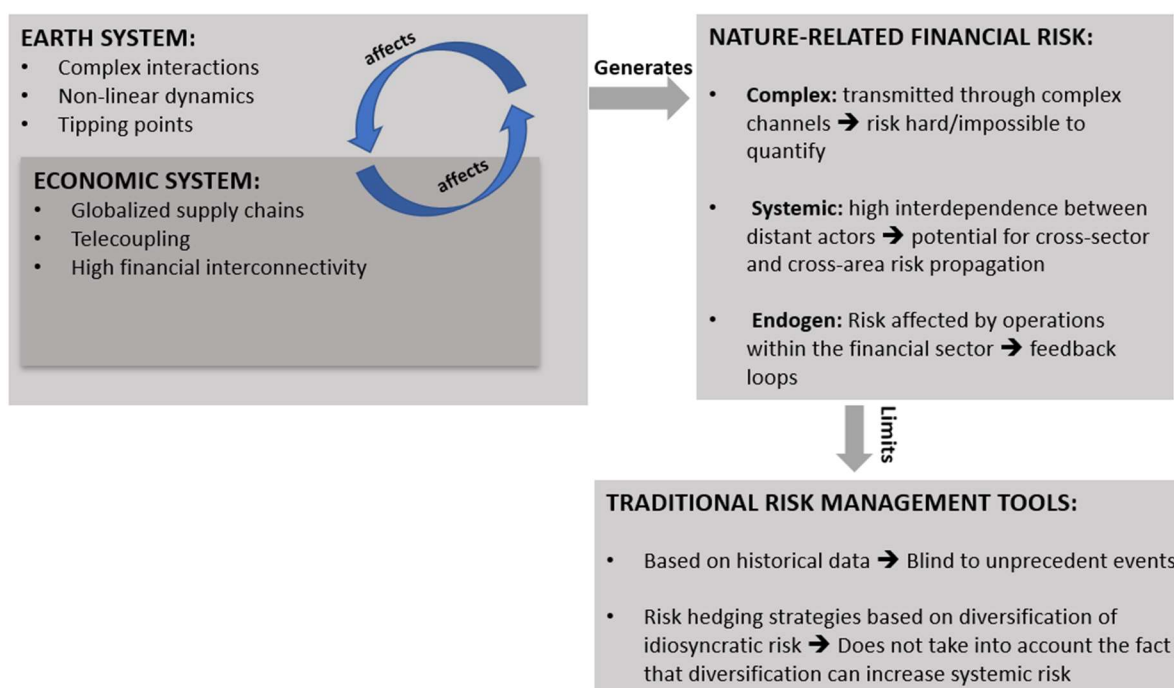


Figure 2-3: Technical barriers to nature-related risk management (source: own elaboration)

**Aligning the financial sector with environmental objectives means not only integrating nature risk considerations into financial decisions, but also making the financial sector actively contribute to the transition by channelling capital towards nature-positive activities.** In recent years, sustainability issues have gained ground in financial circles. They occupy an increasingly important place in the discourse of financial players, and a growing number of investors are including them in their investment. Studies have however shown that sustainability considerations have not fundamentally challenged investors' primary motivation: to maximize their risk-adjusted return (Nykqvist & Maltais, 2022). Hence, strategies to harness mainstream private finance for nature-positive activities has essentially focused on 'building a business case for nature positive outcomes'. While important, this must be coupled to strategies that mobilize public funds to assume (part of) the risks and the costs that cannot be borne by private investors.

**In some cases, it is possible to combine or even create synergy between the objectives of generating competitive financial returns and to have positive environmental impact.** For instance, low-carbon technologies in sectors such as transport and energy have benefited from competitive financial returns, particularly in a context where clear government decarbonization goals and public subsidies allowed to create favorable investment environment for low-carbon projects. On a different note, some nature-positive activities may raise interest from profit-driven investors as a way to generate long-term financial value by reducing exposure to transition and physical risk, and by increasing resilience to environmental shocks (Cooper & Trémolet, 2019). There is in fact abundant empirical evidence establishing a positive relationship between reported environmental performance and financial returns (Friede et al., 2015). This must however be nuanced in the light of two critics: (1) this positive relationship between reported environmental performance and financial returns is observed at the corporate level, but is not empirically established at portfolio level (Revelli and Viviani 2015); and (2) these studies often measure a company's environmental (and social) performance on the basis of its Environmental, Social and Governance (ESG) rating, which has been repeatedly reported as a fuzzy – and even sometimes misleading - metric for effective environmental performance (Levett, 2022).

**In the current market context, investors' financial interests cannot always be (made) compatible with nature conservation/regeneration efforts as related investments often depict relatively low financial returns and high risks.** Nature-positive activities are associated with a range of environmental and social benefits that are not easily monetized and/or do not necessarily translate into private gains for investors. In addition, these activities often require a context-specific approach and entail transaction and monitoring costs. This undermines their cost-competitiveness, limits the possibility of transforming the corresponding investments into liquid financial assets and reduces projects scalability (Kedward et al., 2023). Financial mechanisms, such as environmental markets and payment for ecosystem services (PES), aimed at generating revenue streams from environmentally positive activities have so far yielded limited results, at best channeling a negligible amount of capital to nature (Dempsey & Suarez, 2016), at worst creating perverse incentives and enhancing greenwashing risks (Guizar-Coutiño et al., 2022). This means that mechanisms such as PES or environmental markets, which aim to incentivise nature-positive activities will likely not suffice and need to be coupled with regulations that mitigate harmful practices.

### **2.3.3 The way sustainability is currently addressed by the financial sector**

**Over the last few decades, the growing importance of sustainability in public debate has spread to all sectors of the economy, and the financial sector is no exception.** The incorporation of sustainability issues in the financial sector has taken several forms and the extent to which it has transform traditional financial practices remains challenging to assess.

**As (claimed) sustainability performance became a central element of corporate communications strategies, a range of financial products associated with sustainability**

**claims has grown rapidly, taking up an ever larger share of the market.** For example, the share of green bonds in total EU bond issuance rose from 0.6% to almost 9% between 2014 and 2022 (European Environment Agency, n.d.). Similarly, BloombergNEF estimates that the global volume of "sustainable debt", which includes both green bonds/loans and sustainable bonds/loans, more than doubled between 2020 and 2021, reaching more than USD 1.6 trillion in 2021. General surveys indicates that global sustainable investment grew by 55% between 2016 and 2020, reaching about USD35.3 trillion and representing 35.9% of total assets under management in 2020 (GSIA, 2021). However, such an indicator is quite generic and does not allow for grasping the nuances between sustainable investments. In particular, in the absence of a universal methodology for estimating ESG risks (and impacts), certain financial assets may be considered sustainable by one rating agency but not by another, leading to general confusion and a lack of transparency (Berg et al., 2022).

**Besides questioning the “greenness” of financial products, the concept of sustainable finance – which to date still a misses consensual definition – also raises the question of the motives and approaches that drives financial actors when it comes to define themselves as “sustainable”.** As Schoenmaker (2018) points out, sustainable finance has several dimensions and can be spread in three categories

- “Sustainable Finance 1.0” consist of profit-maximization finance focusing on avoiding unsustainable investment from a risk perspective.
- “Sustainable Finance 2.0” addresses sustainability by balancing financial, environmental and social goals and focuses thus in maximizing “integrated value”, that is the addition of financial, environmental and social value
- “Sustainable Finance 3.0” focuses in maximizing social and environmental impact under the constraint of maintaining financial viability.

In an empirical analysis, Schoenmaker (2018) showed that as of the end of 2016, in both investment and banking sector, virtually all sustainable finance efforts (i.e. more than 99%) fell into the Sustainable Finance 1.0 category (62% for the investment sector and 70% for the banking sector) or into an intermediary category between Sustainable Finance 1.0 and Sustainable Finance 2.0 (38% for the investment sector and 30% for the banking sector).

**Although to date, efforts to integrate sustainability issues remain dispersed and non-institutionalized, the objective of developing a unified governance framework for sustainable finance is today at the center of the debates.** Recent decades have seen the rise of voluntary initiatives led by a wide range of actors including private actors (coalitions), multi-stakeholder platforms and public institutions. These initiatives have formulated recommendations and developed standards with the aim of integrating and formalizing sustainability issues in the financial sector. Notable examples include the Taskforce on Climate-related Financial Disclosures (TCFD), which has developed far-reaching recommendations and guidelines on the disclosure of climate-related risks. Another example is the International Sustainability Standards Board (ISSB), a standard-setting body established in 2021-2022 as part of the IFRS Foundation with a mandate to create and develop sustainability-related financial reporting standards. These initiatives have played - and continue to play - an important role in shaping the field of sustainable finance and their work increasingly stands as a benchmark for public financial policy design. Some see the *emergence of this (hybrid) governance framework* as positive, bringing the concerns and expertise of private financial actors into the political decision-making process. Others, on the other hand, see them as a symptom of the growing influence of private financial actors in public spheres, and fear that this could undermine ambitious efforts to green the financial system. Table 2-4 below shows some of the main voluntary initiatives in the field of sustainable finance.



Table 2-4: Some of the main voluntary initiatives for sustainable finance

Voluntary Initiatives	Descriptions
<b>Network of Central Banks and Supervisors for Greening the Financial System (NGFS)</b>	The Network of Central Banks and Supervisors for Greening the Financial System (NGFS), launched at the Paris One Planet Summit on 12 December 2017, is a group of Central Banks and Supervisors willing, on a voluntary basis, to share best practices and contribute to the development of environment and climate risk management in the financial sector and to mobilize mainstream finance to support the transition toward a sustainable economy.
<b>International Sustainability Standards Board (ISSB)</b>	The International Sustainability Standards Board (ISSB) is a standard-setting body created in 2021-2022 as part of the IFRS Foundation, whose mandate is to create and develop financial reporting standards relating to sustainable development in order to meet investors' needs for environmental information. The ISSB standards will form part of the broader body of International Financial Reporting Standards (IFRS) and will be known by the acronym IFRS-S ("S" for "sustainability") to distinguish them from the accounting standards published by the International Accounting Standards Board. In June 2023, ISSB has issued its first standards: IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures. As with other IFRS standards in financial accounting, ISSB's ambition that IFRS-S standards become the global benchmark for sustainability reporting. These standards are already on the way to adoptions in several countries including the UK, Australia, Canada, China, Japan, New Zealand and Singapore. Regarding the EU, discussion are held on potentially aligning ISSB standards and European Sustainability Reporting Standards (ESRS). However, there are still points of divergence, in particular regarding the adoption of a double materiality approach, which is supported by ESRS but not by ISSB.
<b>Taskforce on Nature-related Financial Disclosures (TFND) and the Taskforce on Climate-related Financial Disclosures (TCFD)</b>	Taskforce on Nature-related Financial Disclosures (TFND) and the Taskforce on Climate-related Financial Disclosures (TCFD) are private financial actor-led initiatives respectively launched in June 2021 and December 2015. They aimed a formulating recommendation and guidelines on for companies to disclose information to support investors, lenders, and insurance underwriters in assessing and pricing financial risk associated with climate change and nature degradation. The TCFD had significant influence in the development of recent sustainable finance policies and initiatives. It's recommendations have notably been used has reference by UNEP-FI in their Principles for Responsible Investment (PRI) and their Principles for Sustainable Insurance (PSI), as well as by the ISSB for the development the IFRS Sustainability Disclosure Standards.
<b>Principles for Sustainable Investment (PRI)</b>	Principles for sustainable investment (PRI) is a network of financial institutions created in 2005 with the support of the UN. The aim of this network is to promote the voluntary adoption by financial actors of a set of principles associated with the inclusion of ESG issues their investment decision-making and ownership practices

**For its part, the EU established a high-level expert group on sustainable finance in 2016 and has since increasingly communicated and legislated on its goal of aligning financial flows with sustainability objectives. To date, legislative efforts have essentially focused on adapting reporting obligation and encourage voluntary action.** The EU Commission presented two legislative packages on sustainable finance in May 2018 and July 2023, and a number of directives, regulations and delegated acts have been implemented. To a large extent, and in continuation of the voluntary initiatives presented above, the EU sustainable finance framework has essentially focused on increasing market transparency and promoting green financial products through the implementation of standards and the extension of corporate reporting obligations (see Table 2-5). On the other hand, legislations forcing financial actors to actively consider environmental issues in their

investment decisions (e.g. by introducing due diligence requirements or setting binding investment criteria) or imposing additional costs for unsustainable portfolio compositions has not found their way into implementation. For example, despite being included in the original proposal, financial institutions have been excluded from the scope of the EU law banning deforestation for key commodity supply chains (Messad, 2022). Similarly, the EU Council has recently positioned itself to exclude the financial sector from the scope of the yet-to-be-implemented law on corporate sustainability due diligence obligations (Ellena, 2023). In a different vein, proposals to create preferential regimes in capital requirements for banks' exposure to climate change have been opposed by the European Banking Authority (Azizuddin, 2022).

Table 2-5: Some of the main EU policies for sustainable finance

EU Policies	Descriptions
<b>The EU Green Taxonomy</b>	<p>The European taxonomy for sustainable activities is a classification framework establishing a series of criteria for an activity to be considered sustainable. Sustainability is defined under six environmental objectives that are: (i) Climate change mitigation, (ii) climate change adaptation (iii) sustainable use and protection of water and marine resources, (iv) transition to a circular economy, (v) pollution prevention and control, and (vi) protection and restoration of biodiversity and ecosystems. To be qualified as 'sustainable', an activity must:</p> <ul style="list-style-type: none"> <li>• “Substantially contribute” (SC) to at least one of the six environmental objectives,</li> <li>• “Do no significant harm” to other environmental objectives</li> <li>• Comply with minimum and explicitly listed social safeguards.</li> </ul> <p>The taxonomy is expected to increase transparency for investors as it will serve as reference for a range of EU directives and regulations, notably those specifying sustainability information disclosure duties of both financial and non-financial entities.</p> <p>The Taxonomy Regulation entered into force in July 2020. Since then, the regulation has been complemented by a series of delegated acts further specifying reporting obligation and adoption criteria regarding the different environmental goals.</p>
<b>The Corporate Sustainability Reporting Directive (CSRD)</b>	<p>The CSRD establishes sustainability reporting obligations of corporations within the EU. It replaces the previous Non-Financial Reporting Directive (NFRD) from 2014, and expands disclosure requirements to a larger array of ESG issues. A new element from the CSRD is that, in addition to providing retrospective information, companies under the directive's scope will have to provide “forward-looking” information and plans compatible with Paris Agreement 1.5C target. Reporting obligations will follow European Sustainability Reporting Standards (ESRS) to be developed by European Financial Reporting Advisory Group (EFRAG) – a private-led association established with the support of the EU Commission – and adopted as Delegated Act by the Commission.=</p> <p>In August 2023, EFRAG published a first set of ESRS drafts. Notable elements include the requirement of reporting under the double materiality perspective. The first companies will have to apply the standards in financial year 2024, for reports published in 2025.</p>
<b>Sustainability-related disclosures in the financial services sector (SFRD)</b>	<p>The SFRD establish disclosure requirements for financial institutions (both financial market participants and advisors) regarding the way they integrate sustainability issues at the entity and product level. In particular, the directive states that financial institutions must disclose the way they integrate sustainability risk and impact (i.e. double-materiality perspective) into their investment decisions, and how they account for sustainability while estimating return of financial products they advise for.</p> <p>The SFRD has been adopted in November 2019 and entered into force in March 2021.</p>
<b>The EU Green bond Regulation</b>	<p>This regulation establish an EU voluntary quality standard for green bonds. To endorse the standard, public and private entity issuing a bond will have to meet sustainability requirements including ensuring that 85% of the funds raised by the</p>

	<p>bond are allocated to economic activities that align with the EU Taxonomy Regulation.</p> <p>Political agreement on the regulation was reached between the EU Commission, Council and Parliament in March 2023 and is expected to become effective in the second half 2024 or early 2025.</p>
<p><b>Amending Delegated Acts on sustainability preferences, fiduciary duties and product governance</b></p>	<p>In April 2021, the EU Commission adopted six amending delegated acts on sustainability preferences, fiduciary duties and product governance. These acts are supposed to ensure that financial firms, for instance asset managers or advisers, take climate and environmental factors into account in their procedures and investment advice. They affect three elements in particular:</p> <ul style="list-style-type: none"> <li>• <b>Investment and insurance advice:</b> Financial advisers will need to carry out a mandatory assessment of the sustainability preferences of their clients or potential clients. They will have to take these sustainability preferences into account when selecting the products to be recommended to those clients. Three categories of products should be integrated to sustainability preferences. First, those that pursue a minimum proportion of taxonomy-compliant activities. Second, those that pursue a minimum proportion of sustainable investments. The third category are those products that consider negative externalities on sustainability, such as reduction of CO2 emissions, protection of biodiversity, or equal treatment of men and women in investee companies. All these considerations are to be determined by the client in his or her dialogue with the financial adviser.</li> <li>• <b>Fiduciary duties:</b> Financial firms will take into account not only all relevant financial risks, but also all relevant sustainability risks. This might mean, for example, the impact of floods on the value of an investment, or the effect of the increase of temperature on investee companies active in the agro-alimentary sector.</li> <li>• <b>Product oversight and governance:</b> Financial advisers and manufacturers designing financial products will now need to consider sustainability factors when designing their products.</li> </ul>

Sustainable finance initiatives and policies are different in nature in that they target several elements of the financial system, such as accounting standards, prudential rules, fiduciary obligations or financing mechanisms. More generally, although they are part of a similar recognition of the need to target the financial sector to address environmental challenges, they reflect different worldviews and opinions on the role that the financial sector (should) play in the environmental transition, leading to different – and arguably antagonistic – theories of change. Understanding the different 'narratives of change' at play in debates in sustainable finance is essential to exploring the (combined) transformative potential of these policies and initiatives, and to identifying the elements of synergy - or contradiction - between them. Section 2.4 below contributes to this end by introducing a related analytical framework.

## 2.4 A conceptual framework for transformative financial policies

In this section, we build the work of Meadows (1999) and Abson and colleagues (2017) to introduce a conceptual framework for sustainable finance policy interventions. The intended contribution of this framework is twofold:

- To provide insights to practitioners and policymakers for assessing the transformative potential of financial policy (packages).
- To help identify promising financial system elements to target in designing transformative financial policies

In this context, "transformative potential" refers to the potential of a given (set of) interventions to transform the financial sector from a driver/enabler of environmental degradation to an

agent of change, supporting the development of a positive economy for people and nature. It is a mechanism of transformation rather than any evaluation of the outcome.

### 2.4.1 Building blocks

The framework draws on a system-thinking perspective and presents the financial sector as a *complex adaptive system* in which small shifts in critical system areas can lead to large changes and potentially system-wide transformations. From this perspective, a better understanding of the system elements and the way they interact can help to identify specific elements ("leverage points") that, if strategically targeted by policy interventions, can trigger systemic change and switch from one system outcome (e.g. the promotion of nature damaging activities) to another (e.g. the support of a nature-positive economy).

Typically, leverage points are located at a different level of "depth" in the system. Points at a shallow level are easier to target but have a limited impact on system operation and outcome, while deeper points are more difficult to target but are more likely to generate transformative change (Abson et al., 2017; Meadows, 1999). In a seminal paper, Meadows (1999) introduces 12 leverage points, which Abson and colleagues (2017) have summarized into four 'realms of leverages' (see table 2-6). Below, we present Abson and colleagues' four realms of leverage and related examples in the context of the financial sector.

- 1. System parameters** are mechanistic elements, often relatively easy to target with policy interventions. In the context of finance these include interest rates, asset prices, but also stock-related factors such as banks capital reserve or capital stocks locked-in particular investments. These elements are at a shallow level of the system in the sense that they are linked to the direct and easily identifiable causes of the system's outcomes. They are therefore often targeted by policy-makers using typical policy 'tool box': taxes, subsidies, capital reserve requirements or changes in key interest rates. Policies that focus solely on parametric elements are capable of generating change at the margin, but have limited transformative potential, as they do not address the structural/underlying factors that shape the system's internal dynamic.
- 2. Feedback elements** refer to the characteristics of the interactions between system components. They can be related to self-reinforcing or self-correcting feedback loops, as well as the delay in response between feedbacks. As in every system where market dynamics play an important role, feedback elements are central to the financial sector. Changes in asset prices information signals on the preferences and expectations of market players, and to the way in which they process new information and reflect it in their (investment) decisions. For instance, economic consequences of ecosystem collapse may trigger a reinforcing feedback loop between macroeconomic deterioration and financial instability (see figure 2-2 above). On the other hand, increased awareness regarding nature-related risk may feedback into investors' preferences/expectations and (financial) policy responses, participating in reorienting investment flows towards greener activities. Hence, the financial system is driven by a complex interweaving of a multitude of feedback loops, making the outcome of policy interventions particularly difficult to predict. The implications of feedback loops for financial policy are twofold. They imply:
  - recognizing complexity and avoiding policy interventions that are essentially based on overly simplistic assumptions describing purely linear relationships - typically, avoiding policies that focus on a single parametric element;
  - acknowledging uncertainty and fostering system's flexibility and reflectivity by allowing actors to experiment, learn from their mistakes and adapt, rather than focusing on achieving theoretically deemed optimal outcomes.

While interventions on feedbacks can drive significant changes, their remain conditioned by deeper system elements that have to do with the way the system is designed and its underlying values, beliefs and goals.

3. **The design elements** of the system refer to the social and institutional structures that governs the system and shape the interactions between the system elements and actors. Design elements may refer to: (1) the rules and norms that determine information flows and thus contribute to the way actors respond to them (e.g. the format of financial reporting obligation); (2) the regulatory frameworks that define the legal obligations of system actors (e.g. macroprudential or due diligence requirements); (3) the power structures that define which (groups) of actors have the most influence on the dynamic of the system (e.g. corporate governance rules or the institutional framework for financial policy-making). Design elements operate at a deeper level of the system than parameters or feedbacks as they provide the structure to govern them. They can therefore produce a higher level of transformative change.
4. **Intent characteristics** constitute the paradigmatic body of the system. They are rooted in the (conscient and inconscient) goals, beliefs and values of the actors who make up the system, and thus define the system's function and the direction. Interaction and confrontation of intent elements tend to define a dominant narrative that will serve has (normative) justification for system setting and changes, notably at the design level. Changes in intents can lead to profound transformations. The paradigm shift in economic theory in the 1980s, from Keynesianism to neo-liberalism, and the associated changes in political doctrine, market governance and, more generally, in the economy and society as a whole, is a clear example of the transformative power that changes of intent can have (Palley, 2004). However, changes in systems' intents are difficult to trigger, as they generally follow long-term trends. They are also more likely to occur following systemic shocks (e.g. financial crises or wars) that disrupt the status quo and challenge established norms, values and institutions, providing an opportunity to redefine society's priorities and aspirations.

Table 2-6: Different notion of leverage points and associated examples from the financial sector. (source: own construction based on Abson et al. (2017) and Meadows (1999))

Abson's realms of leverage (2017)	Meadows' 12 Leverage points (1999)	Examples of related financial sector elements
<b>Parameters:</b> Relatively mechanistic characteristics typically targeted by policymakers	Constants, parameters, numbers	Interest rates, asset prices, capital stocks.
	Size of buffer stocks, relative to flows	Capital reserves of financial institutions
	Structure of material stocks and flows	Financial structures of companies (i.e. debt equity ratios)
<b>Feedbacks:</b> Interactions between elements within a system of interest that drive internal dynamics	Length of delays, relative to rate of system change	Frequency of financial reporting obligations, timeframe used in risk assessment methods.
	The strength of negative (self-correcting) feedback loops, relative to the impacts they are trying to correct against	The extent to which awareness of a particular type of financial risk feedback into asset prices and investors decisions, thereby correcting excessive risk taking.
	Gain around positive (self-reinforcing) feedback loops	The intensity of reinforcing feedback loops between investors loss in confidence and asset price depreciation leading to phenomenon such as fire sales or speculation bubble explosion.

<b>Design:</b> Social structures and institutions that manage feedback and parameters	Structure of information flows	Auditing/reporting standards and related performance metrics
	Rules of the system (incentives, constraints)	Legal obligations and rights of corporations and financial institutions
	Power to change system structure or self-organize	Distribution of power between stakeholders within micro (e.g. corporate) or macro (e.g. EU financial system) institutional structures
<b>Intent:</b> Underpinning values, goals, and worldviews of actors that shape the emergent direction to which the system is oriented	Goals of the system	Economic growth, maximization shareholder value, 'optimization' of financial flows.
	Paradigm underpinning the system	Belief in the efficiency of financial markets, the paradigm of shareholder value primacy, the financial sector as an exogenous element of the socio-ecological systems.
	Power to transcend paradigms	Deliberate and conscious shift in perceiving the financial system role, purpose, and way of working.

### 2.4.2 Relationship between leverage points

The framework doesn't aim to provide a static picture of the financial system, but rather tries to grasp the dynamic interactions between leverage points. As Abson et. al. (2017) put it: *"deeper system characteristics shape and constrain the types of interventions available at shallower leverage points"*. While system underpinning values, goals and worldviews (i.e. intent) build rational and legitimacy for regulations, norms and power structures (i.e. design); parameter and feedback elements are only targetable within the frame allowed by design elements. However, it is important to note that cross leverage influence is not limited to deep elements shaping shallow ones. Intervention at a shallow level may as well influence deeper elements either by:

- reinforcing them – e.g. when the application of a rule contributes to conveying the dominant set of beliefs and values (from design to intent)
- destabilizing them – e.g. when interventions at the parametric level contribute in empowering marginalized actors, thereby redefining power dynamics within the system (from parameter to design).

This underlines the importance of taking cross-leverage dynamics into account when assessing the transformative potential of a given (set of) intervention(s). Shallow interventions alone remain limited in terms of transformative potential and may even further entrench deeper elements, thereby reinforcing status quo and creating more resistance to deep transformation. On the other hand, interventions that focus exclusively on the deepest leverage points may be challenging to implement due to high exposure to system inertia. Rather, transformative policies must focus on identifying a 'chain of leverage' (Fischer & Riechers, 2019) and 'cross realm levers' (Abson et al., 2017). They must coherently and simultaneously intervene at multiple levels of the system and engage with multiple actors and coalitions to destabilize system rigidities, and progressively open the way for deeper interventions.

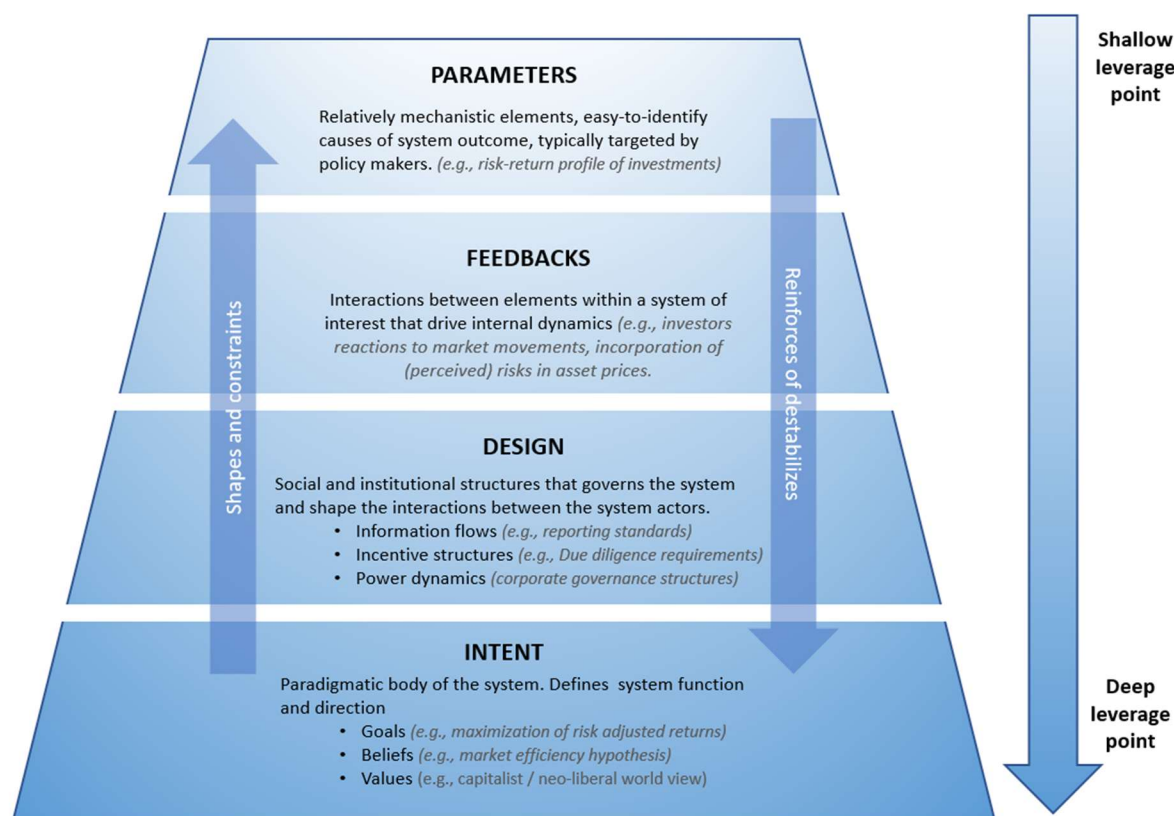


Figure 2-4: Different 'realms of leverage' in the financial sector and interactions between them. Inspired by Abson et. al. (2017)

## 2.5 Application of the framework: promising avenues for transforming the financial sector

Building on the insights of the framework presented above, we argue that transformative change in the financial system will require paradigmatic shifts that redefine the underlying purposes, beliefs and values of the system. The growing awareness of the sustainability and associated role of finance, coupled with the increasingly widespread critique of free market ideology, are both helping to create, we believe, the momentum for such fundamental changes to emerge. We further argue that a combination of policy interventions at different levels of system depth is needed to reinforce this momentum and influence the new system's trajectory.

In this section, we propose a set of three "paradigmatic shifts" that we believe hold promise for putting the financial system on the right track to achieving nature positive outcomes. Presented paradigmatic shifts are fluid and interactive. They constitute targeted changes at the intent level of the system, and are presented with a set of related policy interventions at the design, feedback and parameter levels, that, taken together may constitute a chain of leverage for transformative change in the financial sector.

The paradigmatic shifts and related interventions presented below should not be interpreted as a comprehensive policy package. Rather, they can be interpreted as (deemed) promising avenues to be explored, as their identification process is based on an innovative attempt to address sustainability issues in finance from a systemic perspective. In addition, we consider the following list to be interesting in that it is based on a relatively in-depth analysis of current political exchanges related to sustainable finance in the EU, and thus takes stock of the current state of the debate in relation to transformative changes that are needed in the financial sector.

A graphic representation of these three paradigmatic shifts and related shallower interventions are presented in figure 2-5 at the end of this section.

### 2.5.1 Paradigmatic shift 1: From external to embedded financial systems

Since ecosystem services have always been provided 'free of charge' to economic agents, conventional economic models have long neglected our economy's dependence and impact on nature. They therefore failed to incorporate them in economic and financial decisions. As environmental degradation has worsened and the rhetoric of sustainability has gained currency, the benefits - and the costs associated with the loss - of ecosystem services have become more visible to economic agents, and the need to assess exposure to physical and transition environmental risks has become more salient for financial actors. However, incumbent efforts to green the financial sector have so far essentially focused on an "outside-in" perspective: dealing with potential impact of nature degradation on the financial sector; and not the other way around (i.e. the impact of the financial sector decisions on nature). Such perspective fails to capture the fact that our economy – and thus our financial system – is embedded in nature (Dasgupta, 2021). A paradigm shift must then take place, where the financial sector is fully integrated into the socio-ecological systems, and where concerns about the stability of the financial sector and the viability of the planet are addressed at unison.

#### Related policy interventions:

At the design level, an important step in building an embedded financial system is to adapt the structures of the information flows that shape the interactions between its players. The accounting data generated as part of the reporting obligations of companies and financial institutions constitute the raw material for any financial analysis. Therefore, reporting standards need to reflect the new reality of the financial system. Going beyond just reporting on financial institution and companies' exposure to nature-related risks, they must reflect the extent to which they contribute to the aggravation of these risks at the systemic level. On this point, the EU have been paving the way, **adopting a double materiality** perspective in corporate and financial institution reporting framework. In practice, a double materiality approach in reporting raises a range of administrative and technical challenges. This will require and encourage set of intervention at the feedback and parameter level including the development of metrics and indicators to identify and assess relevant environmental/social factors, methods to convert them into risk terms, and channels for feeding this information back to the various players in the value chain including financial institutions.

Another design intervention to build an integrated financial system could be to **develop a "green mandate"** for financial supervisors and central banks. Recognizing the systemic characteristics of nature-related risk, some have argued that such a mandate would not necessarily contradict, but rather complement, the original mandate of these institutions, which is to ensure the stability of the financial system (Schoenmaker & Van Tilburg, 2016). Such a mandate could pave the way for interventions at shallower levels of the system, for example by adjusting banks' capital reserve requirements according to the "green" nature of their portfolios (Cullen, 2018; Van Lerven & Ryan-Collins, 2018), or by incorporating green criteria for asset purchases or the collateral framework into central banks' monetary policies (Schoenmaker & Stegeman, 2022). Such policies are currently being debated in EU policy circles, but to date the main financial supervisors, notably the European Banking Authority (EBA) has been reluctant to adopt such an approach (Azizuddin, 2022).



## 2.5.2 Paradigmatic shift 2: From market fixing to market shaping

The approach to financial sector governance since the 1980s has been based to a large extent on the assumed informational efficiency of financial markets (Fama, 1970), and their ability under perfect competition to deliver an optimizing capital allocation for welfare and economic growth (Hayek, 1945). In this context, public and regulatory interventions have been essentially limited to ensuring enabling conditions for optimal market outcome, notably by promoting (fair) competition, enforcing property rights, increase transparency and internalizing externalities. Sustainable finance initiatives and regulatory efforts have largely followed this approach. They have avoided imposing binding criteria on investment decisions and focused on improving information flows through green accounting standards, taxonomies or standards for green financial assets (see Subsection 2.3.3). The underlying assumption in this approach is that, if provided with the right information, companies and financial players will address social and environmental issues “for their own good”. In light of the new challenges posed by sustainability (see Subsection 2.3.2) and the growing criticism of the supposed allocative and informational efficiency of financial markets, we argue that such a “market-fixing” approach will not suffice to meeting contemporary environmental and social challenges. Instead, we need to move towards a “market shaping” approach (Mazzucato & Ryan-Collins, 2022; Ryan-Collins, 2019), directing the market towards solving key societal challenges, developing a governance structure that focuses on striking the right balance between (1) adopting a precautionary approach that recognizes radical uncertainty and focuses on reducing the probability of catastrophic events (Chenet et al., 2021a), and (2) promoting innovation by allowing (financial) players to experiment, learn from their mistakes and adapt in order to navigate uncertainty (Mazzucato, 2016).

### Related policy interventions:

Shaping financial market towards the realization of great societal challenges will require **developing a strong regulatory framework to effectively address negative social and environmental impact of financial institutions** through their financing/ensuring activities. Strong regulations are currently in force at the EU level regarding money laundering and financing of terrorism (see Table 2-2 above), but recent efforts to extend such obligations to the environmental ground have encountered resistance from both business and government actors.<sup>12</sup> The implementation of robust regulatory framework would have at least two interesting repercussions at the shallower levels of the system. First, proposal and implementation of ambitious regulation would send strong transition risk signals to financial actors, incentivizing them to adopt pro-active behaviors to avoid future compliance costs. Second, imposing due diligence requirements would force (financial) actors to develop capacity to identify and address social/environmental impacts along their value chain.

To steer the financial sector towards meeting societal challenges, we need to go beyond the application of the “do no harm” principle and require financial players to **develop transition plans with long and medium term strategies for social and environmental sustainability**. In this respect, several European laws require companies to publish transition plans setting out their strategy for aligning their (financing) activities with the “net zero” objective of the Paris Agreement. Transition planning requirements stand as promising mechanisms but lack clarity as they are mentioned in the context of several European regulations without the relationships

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<sup>12</sup> Most telling examples are the omission of financial activities from the scope of the EUDR, and the pressure exerted by the EU Council to leave it to the discretion of Member States to decide whether to include financial players in the scope of the CSDDD. See <https://www.uu.nl/en/utrecht-centre-for-water-oceans-and-sustainability-law/student-work/the-eu-deforestation-regulation-turning-a-blind-eye>

between them being clearly established. Hence, it is crucial that EU works on harmonizing these requirements in order to reduce legal uncertainty (Fox et al., 2023). Moreover, current transition planning requirements are essentially focused on climate-related issues. Integrating broader nature-related issues into the transition planning requirements of financial institutions could take us a step further in aligning financial and economic activities with nature positive goals (WWF, 2023). This requires engaging with experts in protecting, managing and restoring nature.

Finally, it should be recognized that even within a sound regulatory framework, nature conservation needs cannot be met by private investment alone (Kedward et al., 2023). In this respect, public banks and public investment funds will have an important role to play, assuming part of the risk involved in developing and implementing innovative solutions, and investing in activities that are necessary for nature conservation/regeneration, but whose characteristics do not provide financial viability to attract private investors. This will require clearly articulating and making explicit the diversity of social and environmental values beyond financial returns alone, with a much bigger emphasis on the wellbeing of nature and people.

### 2.5.3 Paradigmatic shift 3: From shareholder primacy to stakeholder value

Modern corporate governance is largely based on the principle of shareholder primacy. This approach places the shareholder's financial interests at the forefront, and thus posits the maximization of (short-term) financial returns as the company's "raison d'être". The principle of shareholder primacy is largely inspired by the work of Milton Friedman, whose doctrine is succinctly summarized in the title of his 1970 essay: "The Social Responsibility of Business Is to Increase Its Profits" (Friedman, 1970). It is embodied in the application of the fiduciary duties of corporate and asset managers, which, in its dominant/current interpretation, refers to the interests of investors from an essentially financial perspective. Some argue that shareholder primacy has encouraged bad management, short-termism, and led to the detriment of long-term environmental and social considerations (Denning, 2017; Stout, 2012). In addition to accusations of poor performance, shareholder primacy has been criticized on normative grounds, notably because it limits the ability of non-financial stakeholders (e.g. employees, customers) to assert their legitimate interests in the company's activities (Donaldson & Preston, 1995). A change of values and meaning must take place within corporate and market governance, in which the notion of "value" goes beyond its purely financial aspect. This broadening of values would integrate broader social and ecological considerations that not only reflect the (financial) interests of investors but also those of other stakeholders and society in general (Schoenmaker & Schramade, 2023).

#### Related policy interventions:

Several levers have been identified to challenge the primacy of shareholders within financial markets and corporate governance structures. Some of these levers involve targeting power dynamics by **empowering non-financial stakeholders to participate in the corporate decision-making process**. A frequently cited example is the German "co-determination" system, in which employee representatives hold half of board seats in companies with over 2,000 employees<sup>13</sup>. The extension of this system to other stakeholders (more closely linked to the environment) could be an interesting avenue to explore<sup>14</sup>. On a different note, several EU member states, including Italy, Spain and France, **establish a legal status for "mission-driven" companies**. These companies formally include environmental and social objectives in their corporate

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<sup>13</sup> See DGB (n.d.)

<sup>14</sup> See Gelter (2016) for further discussion.

charters. Such legal status is generally accompanied by institutional provisions such as the presence of an internal "mission committee" capable of influencing, or at least issuing recommendations and opinions, on the company's strategic decisions. It should be noted, however, that the adoption of the status of mission-driven companies in countries that recognize them remains voluntary, and has been criticized by some for the lack of constraining mechanism it induces (Moutenet, 2021).

Finally, defining a company's objectives means defining the responsibilities of its managers. In practice, the fiduciary duty of corporate directors is often interpreted as their duty to act in the best (financial) interests of the shareholders. However, Flannigan (2023) points out that the legal basis for such an interpretation is questionable as: "The principled default position is that a corporation is a legal person in its own right [...]. On that understanding, managers are fiduciaries to the corporation itself. They are not status fiduciaries to shareholders or to any other stakeholder class". Moreover, the United Nations Environment Program's (UNEP) report '*Fiduciary Duty in the 21st Century*' further states that financial players need to take a broader view of fiduciary responsibility by integrating long-term social and environmental considerations into their investment choices (UNEP, 2019). Hence, in theory, there is a strong case for a fiduciary duty for managers extended to all stakeholders and non-financial value creation. In practice, however, the incentive framework within which directors operate generally lends itself to a narrower interpretation, since managers are generally appointed and removed by shareholders, and their remuneration is often aligned with the company's financial performance. In this respect, the original text of the EU Due Diligence Directive (CSDDD) included promising provisions aimed at **aligning managers' variable remuneration with the company's environmental performance** (art. 15) and **formalizing directors' "duty of care" with regard to the sustainability due diligence process** (art. 25), but both were rejected by the EU Council.<sup>15</sup>

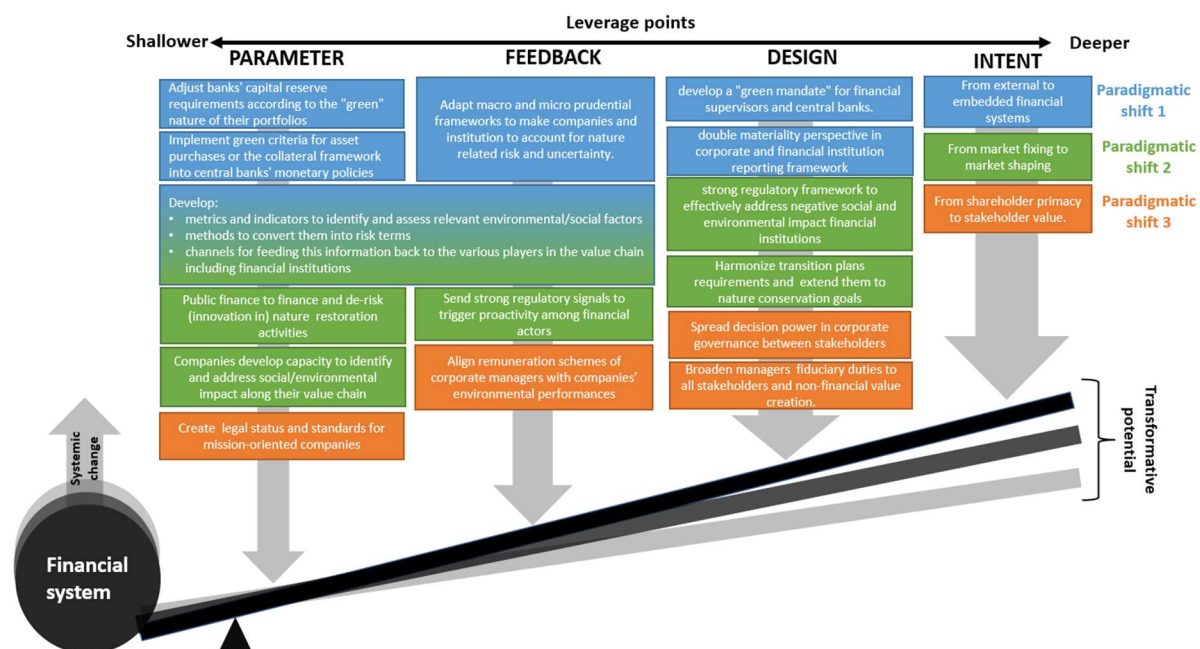


Figure 2-5: Overview of identified leverage points and related policy interventions (source: own elaboration inspired by figure 5 in Pascual et al. (2023))

<sup>15</sup> See PwC (2023) for more details.

## Conclusion

In this report, we identified policy leverage points to trigger transformative change in the context of international trade and the financial sector.

In the comprehensive exploration of trade and sustainability of chapter 1, we examined the intricate world of international trade policies and their profound implications for the environment and broader sustainability goals. Several key findings on Trade emerged:

First, trade openness can have significant ramifications for climate change and biodiversity. The effects of trade on biodiversity are through the spread of pollutants, invasive species, and resource depletion. Second, deforestation law and carbon border adjustments are identified as promising trade regulations, but both are struggling with implementation backlash in the receiving implementation environment. This highlights the need to match top-down regulations with better attention to deliberating and negotiating their implications (risks and uncertainties) in the receiving implementation environment and designing incentives to de-risk the transition and ensure equitable outcomes in the receiving environment. Third, traditional trade regulations have evolved into complex structures within the World Trade Organization (WTO), encompassing agreements on sanitary and phytosanitary measures (SPS) and technical barriers to trade (TBT). These non-tariff measures (NTMs) such as SPS and TBT are more promising mechanisms in EU trade regulation than tariff mechanisms. Fourth, we translate the findings of promising trade mechanisms to the four categories of leverage points defined by Abson (2017), based on Meadows (1999) literature.

EU trade regulations on the environment, require regional entities to navigate the delicate balance between trade liberalization and environmental protection. Two trade regulations that hold promise emerged: Deforestation and forest law; and carbon border adjustments. The deforestation and forest law emphasizes ambitious trade policies that combat illegal timber trade and deforestation. The intent is to halt global deforestation and thus biodiversity and is gaining support through consumer preferences that are driving increasing corporate sustainability in businesses and supply chains. Both the deforestation law and carbon border adjustments have potential to level the playing field (allow those companies that would like to move forward with sustainability to do so without being outcompeted by companies who gain profit through environmental harming practices) and incentivize carbon-efficient production. Nevertheless, they come with their own set of associated risks, including trade disputes and challenges in implementation. These implementation risks can be reduced by ensuring regulations are designed, deliberated, and negotiated in collaboration with the countries and stakeholders that are required to implement them (i.e., those in the receiving environment).

Within the European Union (EU), tariff cuts to encourage sustainability regulations seem to hold less promise than Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT). These regulations, have a longstanding history in the design of the trade system and hold the potential to reshape international trade towards more environmentally conscious practices.

Drawing on the Meadows (1999) leverage points, and the subsequent four categories defined by Abson et al (2017), we identified shallow to deeper leverage points. **Market power leverage** mechanisms, including instruments like the Carbon Border Adjustment Mechanism (CBAM) and zero deforestation commitments, allow for precise adjustments of trade **parameters**, such as taxes, incentives, and standards. At the level of system **feedback**, **traceability** provides an essential aspect of understanding and managing the feedback loops within the system, shedding light on potential issues in the supply chain and paving the way for improvements that can benefit biodiversity conservation. At system **design** level, **certification** processes shape the rules, standards, and information flows governing product production and trade. Their modification holds the promise of encouraging more sustainable practices and aligning the trade system with broader sustainability goals. **Production**

**techniques**, intimately tied to the **intent** of the system, reflect the values and goals embedded within. Shifting towards sustainable and environmentally friendly production methods is the means to realign the system's intent with the grand vision of sustainability. By combining these types of instruments, we will be exploring how to shift trade policies to more sustainable production and consumption practices. Ambitious regulations are a key lever for transformative change in trade, but they cannot be done without deep engagement and deliberation with the receiving implementation environment, where the necessary incentives to de-risk the transition are co-developed. And this is fundamentally where trade and finance intersect for transformative change.

In chapter 2, we examined the financial sector and the potential leverage points for transforming it into a support structure for a nature-positive economy. We first show that the financial sector is not a neutral player in the economy, but operates within a defined ideological, political and institutional framework that has a considerable impact on the socio-economic landscape. We also show that environmental and social issues related to ecosystem degradation and climate stability pose new challenges, firstly in terms of quantifying and managing (systemic) risks, but also in terms of aligning private financial incentives with broader societal goals.

Current efforts - both private and public - linked to sustainable finance testify to a greater resonance of environmental and social issues in the financial sphere. However, our analysis reveals that the various efforts to "green" finance reflect different - and often contradictory - interests and visions of the role finance (should) play in the transition to a nature-friendly economy. As a result, the question of what (transformative) change is needed to align the current financial system with the social and environmental challenges of the 21st century, and what political leverage is required to achieve it, remains largely unanswered.

To contribute to this debate, we draw on the work of Meadows and Abson to identify leverage points for transformative policy interventions within the financial system. We emphasize that a transformative policy approach must intervene coherently and simultaneously at multiple levels of system depth, strategically destabilizing system rigidities and progressively paving the way for deeper interventions. We present three "paradigmatic shifts" that correspond to desirable profound changes in the values, beliefs and objectives that condition the function and trajectory of the financial sector:

- A shift from a financial sector perceived as exogenous to nature, to a financial system that is seen as interacting with, and integrated within, wider socio-ecological systems.
- A shift from a "market fixing" approach that emphasizes self-regulation and limited public intervention, to a "market shaping approach" that actively orients the market towards the realization of major societal challenges.
- The shift from the shareholder primacy paradigm, which formulates the maximization of (short-term) financial returns as listed companies' primary objective, to the stakeholder value paradigm, which integrates non-financial stakeholders (e.g., employees, customers, concerned communities) into governance structures, and adopts a broader notion of value that goes beyond purely monetary or financial considerations, but also includes environmental and social outcomes.

For each of these paradigmatic shifts, we present a series of policy interventions that contribute to reinforcing/triggering momentum for such shifts to happen.

Building upon the political priorities set forth by the European Green Deal and the European Commission's unwavering commitment to eradicating child labor, a significant milestone was reached in 2020 when the European Union initiated the EU Sustainable Cocoa Initiative. This groundbreaking endeavor, termed a 'multi-stakeholder dialogue for sustainable cocoa,' is

designed to address the vital issues of cocoa producers' minimum living income and the sustainable production of cocoa. Within this initiative, the European Union aims to assume a pivotal coordinating role, collaborating closely with a diverse array of stakeholders. The overarching goal is to establish a comprehensive framework for sustainable cocoa production, one that meticulously addresses the economic, social, and environmental aspects of sustainability. This encompasses the eradication of child labor, the enhancement of farmers' income, combating deforestation, promoting fair trade, solving the mining problem, and facilitating exports and better market access in the cocoa sector. We have accordingly chosen the cocoa sector as our area of case study. Cote d'Ivoire being the largest and Ghana being the second largest exporter of cocoa, our focus on the Ghana cocoa production sector is meaningful. The EU, unable to touch the tariff situation has to regulate and standardize based on the SPS regulations only. CABM and Deforestation and forest law enforcement regulations are already in place. Our inference from this investigation is to target Traceability in the context of the cocoa sector- for a much higher order transformative change. Indeed, it holds true that trade systems wield significant structure and power in the global landscape. The implementation of Sanitary and Phytosanitary (SPS) measures has demonstrated its capacity to bring about transformative change, particularly in the realm of agricultural produce within both exporting and importing nations.

As we have seen, there are also levers at the level of financial policy. European financial institutions are involved at several levels of the cocoa value chain, including providing insurance, debt and equity financing to major cocoa traders and processors (IMVO, 2018), or taking up future cocoa contracts as collateral through syndicated loans (van Huellen & Abubakar, 2021). The responsibility of EU financial actors for the ecological and social damage that occurs in the cocoa supply chain is therefore increasingly highlighted (Vandermeulen, 2021). Policies requiring these financial actors to directly identify, communicate, and address the environmental and social risks associated with their activities could frequently help scale up sustainability efforts in cocoa supply chains.

It is essential to recognize that transformative change is an ongoing process, rather than a final destination, and it is precisely this process that we aspire to catalyze through this project. We conclude by drawing attention to the specific context of cocoa, where the convergence of international trade, sustainability, and social responsibility assumes paramount importance. This sector encapsulates the multifaceted nature of our endeavor, and it is here that we intend to channel our efforts to foster positive and enduring change. This initiative presents a promising avenue for future empirical research. It summons researchers to translate the identified leverage points into research questions, particularly within the cocoa sector, where the potential for transformative change is both substantial and urgent.

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